REQUEST FOR COUNCIL ACTION CITY OF SAN DIEGO		CERTIFICATE NUMBER (FOR COMPTROLLER'S USE ONLY) 3000007916
TO: CITY COUNCIL	FROM (ORIGINATING DEPARTMENT): Public Works/Engineering	DATE: 2/4/2015
SUBJECT: Purchase of Replacement Fire Apparatus		
PRIMARY CONTACT (NAME, PHONE): Roy Kirby,(619) 527-6020 MS 730	SECONDARY CONTACT (NAME, PHONE): Michael Frattali, (619) 985-9992 MS 82A	

COMPLETE FOR ACCOUNTING PURPOSES

FUND	720011				
FUNCTIONAL AREA	OTHR-00000000-GG				
COST CENTER	2113140012				
GENERAL LEDGER ACCT	560045				
WBS OR INTERNAL ORDER					
CAPITAL PROJECT No.					
AMOUNT	$8,932,849.04	0.00	0.00	0.00	0.00
FUND					
FUNCTIONAL AREA					
COST CENTER					
GENERAL LEDGER ACCT					
WBS OR INTERNAL ORDER					
CAPITAL PROJECT No.					
AMOUNT	0.00	0.00	0.00	0.00	0.00

COST SUMMARY (IF APPLICABLE): Nine Type 1 Engines, two Aerial Ladders, and one Hazmat Apparatus purchase, preparation, sales tax and tire tax for a total cost of $8,932,849.04.

ROUTING AND APPROVALS

CONTRIBUTORS/REVIEWERS:		APPROVING AUTHORITY	APPROVAL SIGNATURE	DATE SIGNED
Environmental Analysis		ORIG DEPT.	Nagelvoort, James	02/18/2015
Liaison Office		CFO		
Financial Management		DEPUTY CHIEF		
Equal Opportunity Contracting		COO		
Comptroller		CITY ATTORNEY		
		COUNCIL PRESIDENTS OFFICE		

PREPARATION OF: ☒ RESOLUTIONS ☐ ORDINANCE(S) ☐ AGREEMENT(S) ☐ DEED(S)

1. Authorize the Mayor or his designee to execute the contracts with Pierce Manufacturing to provide fire apparatus to the San Diego Fire Department in a total contract amount not to exceed $8,932,849.04 contingent upon the approval of the FY 2016 Appropriation Ordinance, the approval of the FY 2016 Adopted Budget, and the Chief Financial Officer first furnishing one or more certificates certifying that funds necessary for expenditure are, or will be, on deposit with the City Treasurer.

2. The Chief Financial Officer is authorized to expend an amount not to exceed $8,932,849.04 from the Fleet Services Replacement General Fund / 720011 solely and exclusively to provide for the Pierce Manufacturing contracts contingent upon the approval of the FY 2016 Appropriation Ordinance, the approval of the FY 2016 Adopted Budget, and the Chief Financial Officer first furnishing one or more certificates certifying that funds necessary for expenditure are, or will be, on deposit with the City Treasurer.	
STAFF RECOMMENDATIONS: Approve the resolution	
SPECIAL CONDITIONS (REFER TO A.R. 3.20 FOR INFORMATION ON COMPLETING THIS SECTION)	
COUNCIL DISTRICT(S):	all
COMMUNITY AREA(S):	all
ENVIRONMENTAL IMPACT:	This activity is not subject to CEQA as provided in the Guidelines section 15060(c)(3) because the purchase is a continuing administrative or maintenance activity, and therefore not a project pursuant to Guidelines section 15378(b)(2).
CITY CLERK INSTRUCTIONS:	

COUNCIL ACTION
EXECUTIVE SUMMARY SHEET
CITY OF SAN DIEGO

DATE: 2/4/2015
ORIGINATING DEPARTMENT: Public Works/Engineering
SUBJECT: Purchase of Replacement Fire Apparatus
COUNCIL DISTRICT(S): all
CONTACT/PHONE NUMBER: Roy Kirby/(619) 527-6020 MS 730

DESCRIPTIVE SUMMARY OF ITEM:
A request to approve a contract with Pierce Manufacturing to purchase nine type 1 Engines, two Aerial Ladders, and one Hazmat Apparatus for the San Diego Fire Department.
STAFF RECOMMENDATION:
Approve the resolution
EXECUTIVE SUMMARY OF ITEM BACKGROUND: The Fleet Services Division intends to acquire nine type 1 fire Engines, two Aerial Ladders, and one Hazmat Apparatus for the San Diego Fire Department. These purchases are replacements of existing equipment that is at or near the end of its useful life. A list of the proposed vehicle purchases is attached.

All of the equipment will be purchased from Pierce Manufacturing. Fleet used an approved cooperative purchasing agreement with the Houston/Galveston Area Council in lieu of a Request for Proposal.

The purchase will allow the Fire Rescue Department to standardize fire engines and aerial ladders. Of the current fleet, 75 percent of Type 1 fire engines and 65 percent of aerial ladders have been provided by Pierce manufacturing.

The Fire-Rescue Department is standardizing fleet equipment in order to achieve the following objectives:
- Firefighter familiarity with apparatus
- Minimized training required for new apparatus
- Fleet parts standardization
- Mechanic familiarity with components and a corresponding reduction of downtime
- Single point of contact for product support
- Standardization of firefighting tools, storage and outfitting

If approved, the order will be placed in FY 2015. All apparatus will be custom built to SDFD specifications. Delivery of the apparatus is expected by March 2016. Payment will be made upon delivery and there are no FY 2015 expenses. Additional outfitting work, such as the installation of radio equipment, will be performed by City forces. The estimated cost of the work is $700,000 and is included in the annual budget.

FISCAL CONSIDERATIONS: The total cost of all vehicle purchases is $8,932,849.04. The replacement costs are $8,265,413 for the vehicle purchase, $6,000 for preparation fees, $661,233.04 for sales tax, and $203 for tire tax. This amount does not include an estimated

$700,000 in outfitting work which will be performed by City forces is included in the annual budget.

Funds for this purchase will be available in the Fleet Replacement General Fund/720011. Replacement motive equipment funds are generated by annual assignment fees made by the benefitting departments to the Fleet Services Division.

EQUAL OPPORTUNITY CONTRACTING INFORMATION (IF APPLICABLE): This action is subject to the City's Equal Opportunity Contracting (San Diego Ordinance No. 18172, Section 22.2701 through 22.2708) and Non-Discrimination in Contracting Ordinances (San Diego Municipal Code Sections 22.3501 through 22.3517.

PREVIOUS COUNCIL and/or COMMITTEE ACTION (describe any changes made to the item from what was presented at committee): none

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS: Not applicable

KEY STAKEHOLDERS AND PROJECTED IMPACTS: Pierce Manufacturing, San Diego Fire Department

Nagelvoort, James
Originating Department

_____
Deputy Chief/Chief Operating Officer

Fire Rescue Apparatus Requirement for Fiscal Year 15								
Apparatus Type	Model Year	Fleet Equipment Number	Internal Order Number	Replacement Cost	Non Taxable Prep Fee	Sales Tax	Non Taxable Tire Tax	Total Replacement Cost
Type I Engine	KME- 2008	F01936	30003351	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	KME- 2008	F01937	30003316	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	KME- 2008	F01938	30003317	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	KME- 2007	F01942	30003318	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	1995	F01539	30003297	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	1995	F01540	30003298	$620,388.00	$222.23	$49,631.04	$17.50	$670,258.77
Type I Engine	1995	F01541	30003299	$620,388.00	$222.22	$49,631.04	$17.50	$670,258.76
Type I Engine	1995	F01542	30003300	$620,388.00	$222.20	$49,631.04	$17.50	$670,258.74
Type I Engine	1995	F01543	30003301	$620,388.00	$222.20	$49,631.04	$17.50	$670,258.74
				$5,583,492.00	**$2,000.00**	**$446,679.36**	**$157.50**	**$6,032,328.86**
105' Aerial Ladder	1996	F01544	30003302	$991,748.00	$1,000.00	$79,339.84	$17.50	$1,072,105.34
105' Aerial Ladder	1996	F01545	30003303	$991,748.00	$1,000.00	$79,339.84	$17.50	$1,072,105.34
				$1,983,496.00	**$2,000.00**	**$158,679.68**	**$35.00**	**$2,144,210.68**
Haz Mat Apparatus	1996	F01557	30003310	$698,425.00	$2,000.00	$55,874.00	$10.50	$756,309.50
				$698,425.00	**$2,000.00**	**$55,874.00**	**$10.50**	**$756,309.50**
		GRAND TOTAL		**$8,265,413.00**	**$6,000.00**	**$661,233.04**	**$203.00**	**$8,932,849.04**

Note: One Aerial Ladder Apparatus being acquired via a CIP Project is not included.

co= 0451936
u= 7702365

EQUAL EMPLOYMENT OPPORTUNITY

2014 EMPLOYER INFORMATION REPORT

INDIVIDUAL ESTABLISHMENT REPORT - TYPE 4

SECTION B - COMPANY IDENTIFICATION

1. OSHKOSH CORPORATION
2307 OREGON ST
OSHKOSH, WI 54903

2.a. PIERCE MANUFACTURING
2600 AMERICAN DR
APPLETON, WI 54914

c. OUTAGAMIE COUNTY
Y

SECTION C - TEST FOR FILING REQUIREMENT

1-Y 2-N 3-Y DUNS NO.:006126999

SECTION E - ESTABLISHMENT INFORMATION

NAICS: 336120 Heavy Duty Truck Manufacturing

SECTION D - EMPLOYMENT DATA

JOB CATEGORIES	HISPANIC OR LATINO		NOT-HISPANIC OR LATINO												OVERALL TOTALS
			********** MALE **********						********** FEMALE **********						
	MALE	FEMALE	WHITE	BLACK OR AFRICAN AMERICAN	NATIVE HAWAIIAN OR PACIFIC ISLANDER	ASIAN	AMERICAN INDIAN OR ALASKAN NATIVE	TWO OR MORE RACES	WHITE	BLACK OR AFRICAN AMERICAN	NATIVE HAWAIIAN OR PACIFIC ISLANDER	ASIAN	AMERICAN INDIAN OR ALASKAN NATIVE	TWO OR MORE RACES	
EXECUTIVE/SR OFFICIALS & MGRS	0	0	30	0	0	0	0	0	4	0	0	0	0	0	34
FIRST/MID OFFICIALS & MGRS	1	0	55	0	0	0	0	0	8	0	0	0	0	0	64
PROFESSIONALS	0	0	79	0	0	1	0	0	36	1	0	1	0	0	118
TECHNICIANS	2	0	97	1	0	0	1	1	8	0	0	0	0	1	111
SALES WORKERS	0	0	7	0	0	0	1	0	2	0	0	0	0	0	10
ADMINISTRATIVE SUPPORT	0	0	14	0	0	0	0	0	31	0	0	0	0	0	45
CRAFT WORKERS	1	0	255	1	0	6	2	0	9	0	0	0	0	0	274
OPERATIVES	4	1	367	0	0	6	1	0	48	0	0	0	1	0	428
LABORERS & HELPERS	0	0	6	0	0	0	0	0	6	0	0	0	0	0	12
SERVICE WORKERS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8	1	910	2	0	13	5	1	152	1	0	1	1	1	1096
PREVIOUS REPORT TOTAL	12	3	1498	4	0	22	10	1	183	1	0	0	1	1	1736

SECTION F - REMARKS

CO= 0451936

U= FN06905

EQUAL EMPLOYMENT OPPORTUNITY

2014 EMPLOYER INFORMATION REPORT

INDIVIDUAL ESTABLISHMENT REPORT - TYPE 4

SECTION B - COMPANY IDENTIFICATION

1. OSHKOSH CORPORATION
2307 OREGON ST
OSHKOSH, WI 54903

2.a. PIERCE MANUFACTURING - IPP
3100 MCCARTHY ROAD
APPLETON, WI 54913

c. OUTAGAMIE COUNTY

SECTION C - TEST FOR FILING REQUIREMENT

1-Y 2-N 3-Y DUNS NO.:006126999

SECTION E - ESTABLISHMENT INFORMATION

NAICS: 336120 Heavy Duty Truck Manufacturing

SECTION D - EMPLOYMENT DATA

JOB CATEGORIES	HISPANIC OR LATINO		NOT-HISPANIC OR LATINO												OVERALL TOTALS
			********** MALE **********						********** FEMALE **********						
	MALE	FEMALE	WHITE	BLACK OR AFRICAN AMERICAN	NATIVE HAWAIIAN OR PACIFIC ISLANDER	ASIAN	AMERICAN INDIAN OR ALASKAN NATIVE	TWO OR MORE RACES	WHITE	BLACK OR AFRICAN AMERICAN	NATIVE HAWAIIAN OR PACIFIC ISLANDER	ASIAN	AMERICAN INDIAN OR ALASKAN NATIVE	TWO OR MORE RACES	
EXECUTIVE/SR OFFICIALS & MGRS	0	0	10	0	0	0	0	0	0	0	0	0	0	0	10
FIRST/MID OFFICIALS & MGRS	0	0	19	0	0	0	0	0	2	0	0	0	0	0	21
PROFESSIONALS	0	0	22	0	0	1	0	0	6	0	0	0	0	0	29
TECHNICIANS	1	0	44	0	0	0	0	0	6	0	0	0	0	0	51
SALES WORKERS	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
ADMINISTRATIVE SUPPORT	0	0	4	0	0	0	0	0	2	0	0	0	0	0	6
CRAFT WORKERS	3	0	223	1	0	4	2	0	7	0	0	0	0	0	240
OPERATIVES	4	0	239	3	0	5	4	0	8	0	0	0	0	0	263
LABORERS & HELPERS	0	0	7	0	0	0	0	0	1	0	0	0	0	0	8
SERVICE WORKERS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8	0	570	4	0	10	6	0	32	0	0	0	0	0	630
PREVIOUS REPORT TOTAL															

SECTION F - REMARKS

HGACBuy	CONTRACT PRICING WORKSHEET For MOTOR VEHICLES Only	Contract No.:	FS12-13	Date Prepared:	1/9/15

This Worksheet is prepared by Contractor and given to End User. If a PO is issued, both documents MUST be faxed to H-GAC @ 713-993-4548. Therefore please type or print legibly.

Buying Agency:	City of San Diego	Contractor:	Pierce Manufacturing
Contact Person:	Jeff Mitchell	Prepared By:	Kevin Newell
Phone:	858/573/1409	Phone:	909-673-9900
Fax:		Fax:	909-673-9700
Email:	JJMitchell@sandiego.gov	Email:	kevin@southcoastfire.net

Product Code:	UC06	Description:	Pierce Arrow 4-door, aluminum cab and body pumper

A. Product Item Base Unit Price Per Contractor's H-GAC Contract: $393,280.00

B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description if applicable.
(Note: Published Options are options which were submitted and priced in Contractor's bid.)

Description	Cost	Description	Cost
		Open Options tab to this spreadsheet	$163,635.00
		Subtotal From Additional Sheet(s):	
		Subtotal B:	$163,635.00

C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.
(Note: Unpublished options are items which were not submitted and priced in Contractor's bid.)

Description	Cost	Description	Cost
	$0.00	Open Options tab from this spreadsheet	$63,473.00
		Subtotal From Additional Sheet(s):	
		Subtotal C:	$63,473.00

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B). **For this transaction the percentage is:** 11.40%

D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C)

Quantity Ordered:	9	X Subtotal of A + B + C:	620388	=	Subtotal D:	$5,583,492.00

E. H-GAC Order Processing Charge (Amount Per Current Policy) Subtotal E: $2,000.00

F. Trade-Ins / Other Allowances / Special Discounts / Freight / Installation

Description	Cost	Description	Cost
		Sales tax 8%	$446,679.36
		tire fee	$157.50
		Subtotal F:	$446,836.86

Delivery Date: **G. Total Purchase Price (D+E+F):** $6,032,328.86

HGACBuy THE SMART PURCHASING SOLUTION

Pierce Manufacturing is pleased to submit a proposal to **City of San Diego** for a **Pierce® 1500 GPM Triple Combination Pumper**. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

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 all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever 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 edition 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 five (5) 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 South Coast Emergency Vehicle Service 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 fifty (50) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, 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.

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 sheet metal enclosure, valve controls, piping and operators panel) and body 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.

PARKING BRAKE PERFORMANCE

The apparatus manufacturer will provide calculations that indicate the parking brake in theory will be able to hold the fully loaded apparatus on a 25% grade.

SPECIAL INSTRUCTIONS

The apparatus being proposed will be designed and built to match the Match 28068 as close as possible.. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

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.

PUMP TEST

Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

INSPECTION TRIP(S)

The bidder will provide two (2) factory inspection trip(s) for ten customer representative(s). The inspection trip(s) 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.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. 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.

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.

DRAWING, PUMP OPERATOR'S PANEL

A detailed drawing to scale of the pump operator's panel will be provided for approval prior to construction. This drawing will include all of the gauges and controls located on the pump operator's panel. This is a multiple unit order, and the customer will receive one (1) hard copy drawing total for all five (5) units.

FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

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).

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

Seven (7) truck order (includes verification cost and CD) in this order for multiple order credit.

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 114" .

MAXIMUM OVERALL LENGTH

The maximum overall length of the apparatus will be 372" .

ANGLE OF DEPARTURE

The angle of departure will be 13.5 degrees. This will be effective with the truck in a loaded state.

ANGLE OF APPROACH

The angle of approach will be 13.5 degrees. This will be effective with the truck in a loaded state.

WHEELBASE

The wheelbase of the vehicle will be 184.5 inches .

GVW RATING

The gross vehicle weight rating will be 43,840 lbs.

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 0.38" 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 0.25". 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 in-lb.

The frame liner will be mounted inside of the chassis frame rail, beginning at the front edge of the mainframe rail and extending to the rear cab cross member.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be zero degrees for optimum tire life.

The ball joint bearing shall be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

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

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

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

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

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS
KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

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

FRONT TIRES
The front tires will be Michelin 385/65R22.50 radials, 18 ply XFE wide base tread, rated for 19,840 lb maximum axle load and 75 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.

TURNING RADIUS REPORT
A turning radius analysis of the custom Pierce chassis that we are proposing will be included with this proposal. This analysis will provide information on the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

REAR AXLE
The rear axle will be a Meritor™, Model RS-23-186, with a capacity of 24,000 lb.

TOP SPEED OF VEHICLE
A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 mph.

REAR SUSPENSION
The rear springs will be Standens semi-elliptical, 3.00" x 52.00", 12 leaves main with a ground rating of 27,000 lb. Castings will be used for spring hangers with provisions for lubrication. The grease fittings will be 90 degree type and will be accessible without removing the wheels or cutting any sheet metal. The two (2) top leaves will wrap the forward spring hanger pin and the top leaf will wrap the rear spring hanger pin on both the front and rear suspensions.

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.

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

REAR TIRES
Rear tires will be four (4) Michelin 12R22.50 radials, 16 ply "all position" XZY 3 tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud,11.25" bolt circle. The wheels will be Alcoa© part number 893602, hub piloted.

TIRE BALANCE
All tires will be dynamically balanced with wheel weights.

TIRE PRESSURE INDICATOR
NFPA 1901, 2009 Edition, section 4.13.4 requires each tire be equipped with a visual indicator or monitoring system that indicates tire pressure.

Per Fire Department specification, a tire pressure indicator is not on the apparatus as manufactured. This apparatus will be non-compliant to NFPA 1901 standards effective at time of contract execution.

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

HUB COVERS (REAR)
A pair of Realwheels, RW7715, foam mounted, stainless steel high hat hub covers will be provided on rear axle hubs.

LUG NUT COVERS
Stainless steel lug nut covers will be installed on all lug nuts.

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

WHEEL CHOCKS
There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS
There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model 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 MATCH 26298 See Photo's 1 rear of the drivers side rear wheel well. and one forward mounted the same as the o1 unit to meet the tested heat results..

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 4S4M, anti-lock braking system. The ABS will provide a four (4) 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.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™, Disc Plus, Model EX225, disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Bendix®, Model BA-921, with 15.80 cubic feet per minute output at 1,250 rpm.

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 4,362 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, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)

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.

- Midland Pure Air Plus air dryer, Model N4250. Air dryer will consist of the following:

- Spin-on desiccant cartridge

- Coalescing filter that is replaceable and separate from the spin-on desiccant can

- 12 volt heated moisture ejector

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.

High pressure, wire braid reinforced flexible rubber air lines will be provided from the frame to each brake chamber.

The brake lines will not be painted.

AIR INLET

One (1) air inlet with male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located in the driver side lower step well of cab. The inlet will be located in the rear of the step area in rear of the step light. 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 on the driver side pump panel. 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.

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

ADDITIONAL AIR TANK

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 BRAKE VALVE MOUNT SPECIAL

Rear air brake valves will be mounted with AVK fasteners or weld nuts on the rear cross member for servicing.. The valves on the front of the cross member will be extended out to allow removal of the nuts from the mounting studs.

CHECKVALVE AT WET TANK

A check valve will be installed between the air dryer and wet tank.

ALL WHEEL LOCK-UP

An all wheel lock-up system will be installed which applies air to the front brakes and uses the spring brake at the rear.

The front wheel lock will be an air valve on the dash panel in place of the standard rocker switch. A "Front Wheel Lock" label will be installed to the right side of the valve control knob that is visible to the driver.

This will not be an electrical version.

TELMA ACTIVATION (AUTO-ON)

The Telma retarder will include a five (5)-position manual control. The set position of the hand lever will determine the activation level of the Telma, when the accelerator pedal is released. The brake pedal will activate the remaining stages.

The control handle will be located to the right of the transmission shift pad.

TELMA COTROL HANDLE &LABELING

The telma control lever will be reduced in length by 50% and a label will be added for the control lever. Increase/Decrease

TELMA CONTROL BOX LOCATION

The Telma control box will be installed in the P3 lower rear compartment corner on the tank wall several inches of the floor.

AUXILIARY BRAKING SYSTEMS

The two (2) separate auxiliary braking systems installed on the unit will be programmed, or wired, to provide separate or simultaneous operation.

LABEL, AIR TANKS

There will be a stick-on style label provided on all of the chassis air tanks to identify the function a particular tank provided to the chassis (i.e. quick build up, isolated, chassis air supply, etc.).

AIR TANK DRAINS

Air tank drains shall be supplied for the air tanks that are difficult to drain do to the new chassis design. The drains shall be labeled at the drain valve ball valve on both sides and be installed in and easy to

read location. Match units 24023 1-8 as completed at pickup. Label the drains "Front Service Drain" "Rear Service Drain" and Air Horn Tank Drain".

AIR SYSTEM FITTING

The air line at the turbo VPOD control module will be provided with a compression fitting.

ENGINE

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

Make:	Detroit™
Model:	DD13®
Power:	450 hp at 1800 rpm
Torque:	1550 lb-ft at 1200 rpm
Governed Speed:	2080 rpm
Emissions Level:	EPA 2013
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	781 cubic inches (12.8L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor
Coolant Filter:	Cartridge style with shut off valves on the supply and return line

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® focal mounted driveline retarder will be provided on the front of the differential.

The retarder will be the electromagnetic type. Stage one and two of the retarder will be activated when the drivers foot is taken off the accelerator, and stage three and four will be activated with the application of the brake pedal.

A four (4) light, 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.

ENGINE BRAKE

A engine compression brake will be installed with the controls located on the instrument panel within easy reach of the driver.

A control switch will allow the operator to select **EITHER** the Telma Retarder or engine compression brake. An additional control switch with high, medium and low setting will be provided.

The engine compression brake will be installed in such a manner that when the engine compression 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.

AIR CLAMPS CONSTANT TORQUE

All air clamps will be constant torque type clamps.

ENGINE STARTER

The engine starter will be interlocked so that the starter cannot be engaged when the engine is running.

ENGINE AIR INTAKE

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

EXHAUST SYSTEM

The exhaust system will 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 pipes 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 35 degree angle to the rear.

The diffuser will be reduced to approx. 5.00" in the center to accommodate the fire department's air recovery system. There will be a minimum of 2.50" from the exhaust pipe to the under side of the body heat shield. The last 7.00" of the exhaust will be free of hangers and/or clamps. Exhaust heat shield shall be supported with a second muffler clamp to support the heat shield.

DEFLECTOR PLATE

A deflector plate will be provided for the Aftertreatment Control Module (ACM). The deflector plate will keep water and spray from direct contact with the ACM and harness plug in this area.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of approximately 1,352 square inches. ***Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly.*** The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. 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 assembly will include an integral de-aeration tank permanently mounted to the top of the radiator framework, with a readily accessible 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

Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

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

RADIATOR SKID PLATE

A lower radiator skid plate will be supplied for protection. The skid plate shall be constructed of .25" steel plate.

PETCOCK EXTENSION
The petcock will be extended so that the petcock can be accessed and the coolant can be emptied strait down to the ground.

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

A 0.75" drain plug will be located in a low point of the tank for drainage.

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

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 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 rearward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the engine fuel inlet behind a common hinged, spring loaded, brushed stainless steel door on the driver side of the vehicle.

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, at the fuel tank.

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

The fuel filler cap will have a retaining chain and holder provided on the fuel fill door.

LABEL, FUEL DOOR
A metal label will be provided inside fuel door. , to read "Ultra Low Sulfur Diesel Fuel Only".

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 Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

TRANSMISSION PROGRAM
The transmission will shift to neutral when parking brake is set.

TRANSMISSION SHIFT MODE
The transmission mode button on the shifter will be blacked out.

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. The slip joint will be coated with Glidecoat® or equivalent.

STEERING
Dual Sheppard, Model M110, steering gears, 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 WHEEL
The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON HORN BUTTON
The steering wheel 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: Blank

The second row of text will be: San Diego

The third row of text will be: Fire Rescue

TAG/LABEL
The oil tag plate will be provided. Reference part number 15547034.

CHASSIS LUBRICATION DRUM PUMP KIT CREDIT
A Vogel, Model #9900-004-002, drum pump kit will not be supplied with the system.

LABEL VOGEL LUBE SYSTEM
A label will be installed on the vogel lube system stating the type of grease to be used (NLGI-00) and stating "Shop Fill Only"

AUTOMATIC CHASSIS LUBRICATION
A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of NGLI-00 grease to the locations listed. The electronic control unit that forms part of the system, will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located Match job 26298 - Driver's side cargo are rear corner area. on the apparatus.

- TAK- 4 Control Arm Pivot Points

-Rear Axle Slack Adjusters

-Rear Axle Brake Cam Screws

- Rear Suspension Spring Pins

- Rear Suspension Shackle Pins

-Walking Beam Pins (Tandem axle, if applicable).

SKID PLATES
Steel skid plates will be provided under the cab lift cylinders to protect them from damage. The plates will be bolted on to facilitate easy removal and replacement.

GUARD AIR HOSE WITH FIRE RESISTANT WRAP
Guards shall be provided at the drivers front corner of the cab to provide an enclosure for the air hoses goining from the junction block to the cab. The Synflex hose will be wrapped with fire resistant loom from the mnifold block to where it enters the cab.

BUMPER
A one (1) piece, stainless steel bumper, minimum of 10.00" high, will be attached to the front of the frame.

A 9.00" channel will be mounted directly behind the bumper for additional strength.

The bumper will be extended 10.00" from front face of cab.

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

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

The inner and outer edges of the tow eyes will have a 0.25" radius.

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

TOW EYES
Two (2) cutouts will be provided in the front face of the stainless steel bumper to allow two (2) Chicago style tow eyes to extend out the front. The inner and outer edges of the utility eyes will have a 0.25 radius.

The tow eyes will be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus.

The utility eyes will be chrome plated.

TOW HOOKS

No tow hooks are to be provided. This truck will be equipped with a lift and tow package with integral tow eyes.

CAB

The Arrow XT 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 floor to ceiling height inside the crew cab will be 64.00" in the center 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 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 0.50" aluminum. The top will be constructed of 0.19" 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.

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.

The controls will be located in the drivers side cab step well.

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 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.

Cab Lift Interlock

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 battery switch is in the on position. The cab tilt switch will be disabled if the parking brake is released or the ignition switch is turned on.

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.

KICK PLATE

A brushed aluminum kick plate will be installed on the electrical access panel door on the officer side.

DOOR JAMB SCUFFPLATES

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

SCUFFPLATE

A brushed stainless steel scuffplate will be installed on the top edge of both rear facing seat risers. The scuffplate will be flanged to the front to protect the painted edge of the seat riser.

SIDE OF CAB MOLDING

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.

LABEL, MIRROR CONTROLS
The mirror controls will be labeled to denote function.

MIRROR HEAT CONTROL
The master mirror heat switch will be provided on a MUX switch panel located overhead MUX switch panel per approved instrument panel drawings which controls all heated mirrors. The switch will be able to turn the heat on or off.

DOORS
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 0.125". The exterior door skins will be constructed from 0.090" 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 0.38" 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.

ELECTRIC CAB DOOR LOCKS
The front driver and passenger doors will have a door lock master switch built into the interior door latch that will control all front and rear side exit door locks. Each rear cab door will have its own lock control. Each door will have a keyed exterior lock mechanism built into the door handle assembly.

The lock system will include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system will use code hopping technology for high security and be FCC part 15 compliant.

Two (2) additional momentary switch(s) will be installed one (1) on each pump panel that trigger the cab, crew cab and body compartment door locks.

The lock switch on the instrument panel will be red in color and be labeled "Master Lock".

DOOR LOCKS

All the cab door and body door locks will lock and unlock with a single switch at each side pump panel. Switches will be Blank no label. The switch in the cab will be labeled "Master Locks" and have labels for "Lock and "Unlock"

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 strut insert 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.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located 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 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" 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. The fender crowns will have a radius outside corner that will allow the fender crown to extend out further than the standard width crown, thus extending beyond the sidewall of the front tires and allow the crew cab doors to open fully.

INTERIOR CREW CAB DOOR HANDRAIL

A handrail will be provided on each interior crew cab door pan. The handrails will be mounted at a 45 degree angle. These are in addition to the standard crew cab door handle.

CREW CAB WINDOWS

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

WINDOW TINT
Crew cab windows will be tinted with 44 percent light transmission tint. 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)

- All windows in raised roof (If applicable).

TRIM, WINDOW
The chrome locking trim in all the windows will be replaced by a solid black, rubber trim.

STORAGE COMPARTMENTS
Provided on each side of the cab, below the cab floor, to the rear of the crew cab access doors, will be a storage compartment. The compartments will be 11.50" wide x 14.00" deep x 18.00" high.

The doors will be of the single pan construction with a flush quarter turn locking D-Ring latches. A vinyl covered chain will be used as a door stop.

EQUIPMENT MOUNTING SHELVES
There will be two (2) shelves for permanent mounting of equipment provided.

Shelves will be mounted flat on top of the engine cover.

The shelves will be located on the driver's and passenger's side in the crew cab.

The shelves will be supported by cross bracing to keep the area under the shelves open. The shelves will be 26.50" long front to back and as wide as space allows from side to side. Shelves will extend from the front edge of the mux box on the driver's side and the front edge of the air tunnel on the passenger's side to the front edge of the crew cab door opening on each side.

Each shelf will have a 2.00" lip around edge.

Each shelf will be fabricated from .188" aluminum and will be painted to match the cab interior.

CAB INTERIOR
The left and right side dash and center console will be a flat faced design to provide easy maintenance and will be constructed out of painted aluminum.

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

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on 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 upholstery will be red.

CAB INTERIOR PAINT

A rich looking interior will be provided by painting all the metal surfaces inside the cab black, vinyl texture paint.

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 0.25" 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 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 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 each will be provided in the cab. The heaters will have a 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 19.10 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 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 (1) plenum directed to the front and one (1) 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 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.

SUN VISORS

There will be two (2) vinyl covered sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

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.

OPEN TOP STORAGE BIN

An open top bin, will be installed near the officer's seat position on dash. Same as previous order 26298. The bin will be 4.00" wide x 6.00" deep x 3.00" high. The bin will be constructed of .125" aluminum and will be painted to match the cab interior.

MAP BOX

A map box with four (4) bins, open from top, will be installed on the engine tunnel. The map box will be 24.00" wide x 30.00" deep x 8.00" high. The map box will be constructed of .125" aluminum and will be painted to match the cab interior.

The map box will be constructed to include a panel to enclose the space at the driver side rear edge of the engine tunnel between the map box bottom and engine tunnel.

The map box will have a permanent divider at 12.00" from the forward side of the box. The map box will have two (2) different permanent dividers splitting the compartment on each side of the permanent divider at 12.00" from the forward side of the box. A permanent divider will separate the forward portion of the map box into 11.00" wide on the driver side and 13.00" on the passenger side. The rear portion of the box will be split equally into 12.00" wide sections.

Each compartment will contain slots for movable dividers to be placed at half inch increments. The forward driver side compartment will have slots to insert dividers running forward to back. The remaining three (3) compartments will have dividers that run side to side. There will be a total of three (3) 13.00" wide dividers and 16 12.00" wide dividers.

A total of four (4) cutouts, 3.00" wide by 6.00" deep with a 3.00" curve radius will be supplied on the rear of the map box. The cutouts will terminate 2.00" from the bottom of the map box.

SEATING CAPACITY

The seating capacity in the cab will be five (5).

DRIVER SEAT

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt. 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 SEAT

A seat will be provided in the cab for the passenger. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will be provided with 6.00" double locking fore/aft slide adjustment. The seat back will be a high back style with 9 degree fixed recline angle and side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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 SIDE OUTBOARD SEAT

There will be one (1) forward facing, foldup seat provided at the driver side outboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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 flip-up seat provided at the center position in the crew cab. The seat back will have an aluminum backing, covered with foam padded upholstery. The seat bottom will be constructed of a piece of plywood covered with foam rubber and upholstery. The bottom cushion will have its bottom covered with brushed stainless steel, for a pleasant appearance when the seat bottom is in the up position. 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 be furnished with a three-point, shoulder type seat belt. 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.

FORWARD FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) forward facing foldup seat provided at the passenger side outboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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.

REAR FACING OVERHEAD STORAGE COMPARTMENT

A storage compartment, 86.00" wide x 10.00" high x 14.00" deep at the bottom, tapered at the top, will be installed overhead and above the rear facing crew cab seats. The compartment will angle rearward to match the contour of the raised crew cab roof and will include four (4) lift-up doors. It will be constructed of smooth aluminum and painted to match the cab interior.

Compartment has the following features:

- Easy one-handed operation
- Compressed gas spring equipped
- Non-locking slam style paddle handle latch
- A 2.00" high divider between each compartment opening.
- Four (4) LED lights, one (1) behind each compartment opening at the front top edge of the opening directed into the compartment.

MATTING IN EMS COMPARTMENT

Vinyl grating will be provided in two (2) EMS compartments. Tile color will be red in the rear facing trays.

The vinyl grating will be .50" thick and be cross bonded by .25" diameter ribbed sections spaced for aeration.

COMPARTMENT LIGHTING

There will be two (2) single 9.00" On Scene Solutions, Model Night Stick, LED lights provided in the install under the shelves behind dr & ps seats about 2/3 of the way toward the front of unit. Install rocker switch in the triangle area below the power points. Lights should also switch on when either of the c/c doors are opened. Label "STORAGE LIGHTS" .

A rocker switch and the crew cab doors will turn on the lighting on.

SEAT UPHOLSTERY
All seat upholstery will be maroon woven with black Imperial 1200 material.

EMBROIDERY, SEATS
The cab seats will be provided with custom embroidery. The Fire Department will provided a picture of the design at time of approval drawing return.

This option will be provided for the driver, officer, and five (5) seat positions in the crew cab. The SCBA seats will have the embroidery on the hinged outboard head rest of each seat, and the non SCBA seat will have it on the seat headrest.

FOOT REST ANGLE
A knurled handrail type will be provided for the officers position. The handrail will be mounted to the engine housing with a flat stanchion and a U shaped bracket. The handrail will extend the width of the officers seat area. The foot rest will be positioned approximately 3.50" from the forward wall.

FORWARD FACING OUTBOARD SEAT
The forward facing seat frames will be shortened to allow 24.00 of clearance between the forward facing outboard seat and the rear facing seat riser. The seat frame will be modified to raise the seat approximately 3.00 to 4.00" off the floor of the rear of the cab. The seats will be fastened to the rear cab wall with Four (4) 3/8" grade 8 hex head bolts and AVK fasteners.

SEAT BELTS
All seating positions in the cab and crew cab will have red seat belts.

The belts will also include the Ready Reach® D-loop assembly to the shoulder belt system. The Ready Reach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT
All seating positions furnished with 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 BELT MONITORING ON COMMAND ZONE COLOR DISPLAY
A seat belt monitoring screen will be provided on the Command Zone color display. The system will be capable of monitoring up to ten (10) seating positions in the cab with green and red seating icons illuminated as follows:

Seat OccupiedBuckledGreen Icon

Seat OccupiedUnbuckledRed Icon

Seat Not OccupiedBuckledRed Icon

Seat Not OccupiedUnbuckledNo Icon

The seat belt monitoring screen will become active on the Command Zone color display when:

The park brake is released:

And

There is any occupant seated but not buckled or any belt buckled without an occupant:

And

There are no other Do Not Move Truck conditions present. As soon as all Do Not Move Truck conditions are cleared, the seat belt monitoring screen will be activated.

The seat belt monitoring screen will be manually selected anytime the Command Zone color display is powered.

The seat belt monitoring screen will be accompanied by an audible alarm that will have a unique sound that shall be different then all other alarm sounds on the vehicle and will activate when a red seat icon condition exists and the parking brake is released. A "Seat Belt Alarm " Tag will be provided above the separate buzzer at mid dash height.

HELMET STORAGE, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 14.1.8.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, chrome LED spotlights located on the cab roof, one each side to match 26298. The spotlights will be mounted to the surface of the cab roof.

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

SPOTLIGHT CONTROLLER
There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS
The remotes to control the spotlights will be located one (1) within reach of the driver and one (1) within reach of the officer.

HAND HELD LIGHT
There will be four (4) Streamlight E-Spot™ LiteBox Product Number 45855 flashlights with an orange thermoplastic body provided. These lights will be connected to battery direct 12 volt DC power.

The location will be to match 26298, one in D3, P1 and one each side of the crewcab next to forward facing seats see photo'.

CAB INSTRUMENTATION
The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of 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 directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

CAB INTERIOR
The wrap-around style high impact ABS plastic cab dash fascia will be designed to provide unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

GAUGES
The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter Gauge (Volts):
    - Low volts (11.8 VDC)
        - Amber indicator on gauge assembly with alarm
    - High volts (15 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very low volts (11.3 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very high volts (16 VDC)
        - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel Level Gauge (Empty - Full in fractions):
    - Low fuel (1/8 full)
        - Amber indicator on gauge assembly with alarm

    - Very low fuel (1/32) fuel
        - Amber indicator on gauge assembly with alarm
- Engine Oil Pressure Gauge (PSI):
    - Low oil pressure to activate engine warning lights and alarms
        - Red indicator on gauge assembly with alarm
- Front Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm
        - Red indicator on gauge assembly with alarm
- Rear Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm.
        - Red indicator on gauge assembly with alarm
- Transmission Oil Temperature Gauge (Fahrenheit):
- High transmission oil temperature activates warning lights and alarm
    - Amber indicator on gauge assembly with alarm
- Engine Coolant Temperature Gauge (Fahrenheit):
    - High engine temperature activates an engine warning light and alarm
        - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. 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)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)

- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)
- The following red telltale lamps will be present:
- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

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

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up 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:

- Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
- Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

- Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel back lighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the back lighting intensity. The third switch position increases the panel back lighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications:

- High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. 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.
- The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.
- 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 disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be 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.
- 4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.
- Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.
- Parking brake control: An air actuated push/pull park brake control valve will be provided.
- 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 four (4) switch panels in the engine tunnel console facing the driver, up to three (3) switch panels in the overhead console on the officer's

side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

A diagnostic panel will be accessible while standing on the ground and 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)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature. The upper right section will display odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

- Officer Speedometer, A Class I digital display speedometer will be provided on the officer side overhead position.

"DO NOT MOVE APPARATUS" INDICATOR

There will be a Whelen, Model 5SR00FRR, flashing red LED indicator light located in the driving compartment. The light will be illuminated automatically per the current NFPA requirements and labeled "Do Not Move Apparatus If Light Is On".

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

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Hatch Door Open
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated red whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL
For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

SPARE CIRCUIT
There will be six (6) 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 next to the officer's seating position and three in the crew cab DS near the light storage switch.one on the officer's side per photo on the customer list item #27 from 24023.

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

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

SPARE WIRE
There will be one (1) Belden Model 8723 060 cable installed in the apparatus.

This cable will be routed from electrical distribution under the shelf on the PS crewcab wall and extended to switch panels overhead above the officer.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

SPARE CIRCUIT
There will be one (1) 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 10 amps at 12 volts DC.
- Power and ground will terminate behind the officer's seat in the corner next to the "B" post for the thermal imaging camera.
- Termination will be with water resistant male and female plugs.

Wires will be sized to 125% of the protection.

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

14 GAUGE SPARE WIRE

There will be a four (4) pair of 14 gauge wires, one (1) with black insulation and one (1) with white insulation, included in a separate loom installed in the apparatus.

These wires will be routed from Driver pedestal, behind seat, to reach outboard horizontally flat area outboard of seat; Rear cab extension area, outboard rear cab corner, BOTH sides; Officer position, from the vertical wall between the glove box door and the engine dog house (viny and extended to the equipment location, the vertical wall between the front and rear cab doors, passenger side, below the fixed window. They shall have 18-24” of coil at each end. They will have NO power supplied to them .

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

18 GAUGE SPARE WIRE

There will be a one (1) pair of 18 gauge wires, one (1) with black insulation and one (1) with white insulation, included in a separate loom installed in the apparatus.

These wires will be routed from P.S. overhead and extended to P.S. in the electrial wiring location..

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

SPARE CIRCUIT

There will be one (1) 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 50 amps at 12 volts DC.

Power and ground will terminate P. S. crew cab wall per 26298.

Termination will be a .38" isolated stud that is less than 1.38" in total length.

Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT

There will be one (1) 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 ignition switched power.

The negative wire will be connected to ground.

Wires will be protected to 40 amps at 12 volts DC.

Power and ground will terminate P. S. behind the officers seat in the crew cab on the outside wall per 26298.

Termination will be with 3/8" studs and plastic covers.

Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT

There will be one (1) 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 20 amps at 12 volts DC
- Power and ground will terminate one in P1 rear ward on the shelf level
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125% of the protection

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

EMERGENCY LIGHT SWITCHES

The emergency light switching will work as follows: The emergency master switch must be activated for all emergency lighting to function.

The emergency master "saved states" feature will not be activated. This means that if the emergency master switch is on and individual switch is turned off. Then the emergency master is turned off, upon turning the emergency master switch back on the individual switch which was previously turn off will turn back on.

All emergency lighting will be turned on whenever the emergency master switch is turned on.

Individual emergency light switches may be deactivated and/or reactivated after the emergency master switch is turned on.

Switches will be per the following: Emergency Master, Lightbar, Front Warning, Side Warning, Rear Warning, High Beam Flash will be combined with Front Warning, Upper & Lower Rear Warning will be combined under Rear Warning.

SWITCH PANEL SAN DIEGO

The switch panels will be arranged per the customer supplied layout.

INFORMATION CENTER

An information center employing a 7.00" diagonal color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display
- Display can be changed to an available foreign language

OPERATION

The information center will be designed for easy operation for everyday use.

The page button will cycle from one screen to the next screen in a rotating fashion.

A video button will allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed will return the information center to the vehicle information screens.

A menu button will provide access to maintenance, setup and diagnostic screens.

All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- Exterior Ambient Temperature
- Time (12 or 24 hour mode)
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text.

PAGE SCREENS

The Information center will include the following screens:

- Load Manager Screen
  - A list of items to be load managed will be provided. The list will provide:
  - Description of the load
- Individual Load Shed Priority Screen
  - The lower the priority number the earlier the device will be shed should a low voltage condition occur
- Load Status Screen
  - The screen will indicate if a load has been shed (disabled) or not shed.
  - "At a Glance" color features are utilized on this screen
- Do Not Move Truck Screen
  - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:
    - Driver Side Cab Door
    - Passenger's Side Cab Door
    - Driver Side Crew Cab Door
    - Passenger's Side Crew Cab Door
    - Driver Side Body Doors
    - Passenger's Side Body Doors
    - Rear Body Door(s)
    - Ladder Rack (if applicable)
    - Deck Gun (if applicable)
    - Light Tower (if applicable)
    - Hatch Door (if applicable)
    - Stabilizers (if applicable)
    - Steps (if applicable)
- Chassis Information Screen
  - Engine RPM
  - Fuel Level
  - Battery Voltage
  - Engine Coolant Temperature
  - Engine Oil Pressure
  - "At a Glance" color features are utilized on this screen
- Active Alarms List
  - This screen will show a list of all active text messages. The list items text will match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

MENU SCREENS

The following screens will be available through the Menu button:

- System Information
  - Battery Volts

    - Pump Hours
    - Transmission Oil Temperature
    - Pump Engaged
    - Engine Coolant Level
    - Engine Oil Level
    - Oil level will only be shown when the engine is not running
    - Power Steering Level
- Display Brightness
    - Brightness
        - Increase and decrease
        - Default setting button
- Configure Video Mode
    - Set Video Contrast
    - Set Video Color
    - Set Video Tint
- Startup Screen
    - Choose the screen that will be active at vehicle power-up
- Date & Time
    - 12 or 24 hour format
        - Set time and date
- View Active Alarms
    - Shows a list of all active alarms
        - Date and time of the occurrence is shown with each alarm
    - Silence alarms
        - All alarms are silenced
- System Diagnostics
    - Module type and ID number
    - Module version
- Module diagnostics information
    - Input or output number
    - Circuit number connected to that input or output
    - Circuit name (item connected to the circuit)
    - Status of the input or output
    - Power and Constant Current module diagnostic information

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing vehicle information.

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

INTERCOM SYSTEM

A six (6) position David Clark, Model U3800, intercom system with single radio interface capability at the driver and pump operator's positions and dual radio interface at the officer position will be provided. Three (3) crew cab positions, located at two (2) rear facing seats and one (1) forward facing seat, will have intercom only.

The following components will be supplied with this system:

- One (1) U3805 Radio cord junction module
- One (1) U3815 Radio interface headset station (Driver)
- One (1) U3816 Dual radio interface headset station (Officer)
- One (1) U3815A Radio interface module (Pump Panel)
- One (1) U3800 Master station (2 adjacent Crew)
- One (1) U3802 Remote intercom unit (1 Crew)
- One (1) C3820 Power cable
- All necessary cables and connectors

RADIO / INTERCOM INTERFACE INCLUDED

All radio interfaced stations will have universal radio interfaces installed. The interface wiring will be routed within the cab to passenger's side front crewcab wall .

UNDER THE HELMET HEADSET

There will be five (5) under the helmet, headset(s) provided Match 26298.

Each David Clark, Model H3442, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress

- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction

INTERCOM POWER ROUTING

The intercom DC power is to be routed to the PS crewcab wall under shelf.

PORTABLE RADIO CHARGER INSTALLATION

There will be four (4) customer supplied portable two-way radio chargers(s) sent to the apparatus manufacturers preferred radio installer to be installed one at each seating position. Specific shipping requirements will be followed.

TWO WAY RADIO SPEAKER INSTALLATION

There will be three (3) customer supplied two way radio speakers sent to the apparatus manufacturers preferred third party installer to be installed two on the cab dash and one at the pump panel.

Specific shipping requirements will be followed.

COMPLETE MDT INSTALLATION

There will be one (1) customer supplied Mobile Data Terminal (MDT), Docking station, Mounting bracket, power supply, antenna, GPS, modem, and all cabling sent to the apparatus manufacturers preferred installer to be installed on the officer's side dash. Specific shipping requirements will be followed.

MOBILE RADIO MODEM INSTALLATION

There will be one (1) customer supplied modem(s) sent to the apparatus manufacturers preferred installer to be installed on the cab roof to match 26298.

Specific shipping requirements will be followed.

TWO WAY RADIO INSTALLATION

There will be two (2) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed As per the IP drawing shows, 800 in 7 and VHF in 5 per the shipping document.

No antenna mount or whip will be included in this option.

Specific radio shipping requirements will be followed.

RADIO ANTENNA MOUNT

There will be four (4) standard antenna-mounting base(s), 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 seat and the additional mount(s) will be located left and right side rear crew cab roof corners per customer provided layout. Match 25333.. The cable(s) will be routed to the PS rear crew cab below the shelf .

KNOX-BOX®

There will be a Knox-Box KeySecure 1, Model 2611, with key pad access. It will have a blue strobe light to warn when the master key is in an unsecured position. The box will be surface mounted and installed On the dash to match placement on 26298, within the cab.

ELECTRICAL POWER CONTROL SYSTEM

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

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

COMMAND ZONE CONTROL SYSTEM

A solidstate electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

Green LED indicator light for module power

Red LED indicator light for network communication stability status

Control system self test at activation and continually throughout vehicle operation

No moving parts due to transistor logic

Software logic control for NFPA mandated safety interlocks and indicators

Integrated electrical system load management without additional components

Integrated electrical load sequencing system without additional components

Customized control software to the vehicle's configuration

Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters

Complete operating and troubleshooting manuals

USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the Command Zone control system modules will meet the following specifications:

Module circuit board will meet SAE J771 specifications

Operating temperature from -40C to +70C

Storage temperature from -40C to +70C

Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

Text description of active warning or caution alarms

Simplified warning indicators

Amber caution light with intermittent alarm

Red warning light with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be

provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with an IBM compatible computer.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

VOLTAGE MONITOR SYSTEM

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs will consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The Command Zone control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

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

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

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

ELECTRICAL HARNESSING INSTALLATION

All 12-volt wiring and harnessing installed by the apparatus manufacturer will conform to specification PM-QA W-101: Pierce manufacturing Wiring Harness Specification.

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

SAE J1128 - Low tension primary cable

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

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

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

NFPA 1901 - Standard for automotive fire apparatus

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

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

Wiring will be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. 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. 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

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.

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.

BATTERY SYSTEM

Five-(5) Optima 1000M 12 volt, 800 CCA, 110 min reserve capacity, batteries with a system rating of 4000 CCA at 0 degrees Fahrenheit and 550 minutes of reserve capacity.The batteries shall be provided with SAE posts.

ISOLATED BATTERY

One (1)-12 volt, Optima 1000M battery shall be provided for voltage sensitive components. A battery isolator that is appropriately suited for the battery capacity shall 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 Guest, Model 2304A, master battery switch, to activate the battery system, will be provided to the right side of the steering column on a special bracket.

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 0.188" 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.

The compartments will include formed fit heavy duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

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.

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/ AIR COMPRESSOR

A Kussmaul Pump Plus 1200, Model 091-9-1200, single output battery charger/air compressor system will be provided. A display bar graph indicating the state of charge will be included.

The automatic charger will maintain one (1) set of batteries with a maximum output current of 40 amps.

The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

The air compressor will be plumbed to the rear reserve air tank.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

Battery charger/compressor will be match 26298. High in the forward back corner of the left front corner of D3. See Photo..

The battery charger indicator will be diplayed through the window behind the driver seat. The display will be mounted on a bracket so that it is visible from outside the apparatus in the front lower corner of the window.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul™, Model 091-55-20-120, 20 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include red weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Ratting (amps)

- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

ALTERNATOR

A Leece-Neville, Model 4962PA, alternator will be provided. It will have a rated output current of 320 amps, as measured by SAE method J56. The alternator will feature an integral, self diagnostic regulator and rectifier. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

SPECIAL LOCATION POWER & GROUND STUDS

All of the chassis power and ground studs will be mounted to the bottom of the chassis frame for easy accessibility.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

SEALED CHASSIS HARNESS END CONNECTORS

All end connecters that are not used and exposed to the elements will be sealed.

CUSTOMER RADIO WIRING

There will be one (1) 12 volt combination wiring leads of which each will include, one (1) battery direct, one (1) ignition and one (1) negative, for use with radio equipment. Each lead will be 18" long and be provided from PS over head switch panel to the PS crew cab equipment area.. The leads will be clearly marked and in a coil. A breaker rated for 20 amps will be provided for circuit protection of the battery direct powered lead with a minimum of 12 gauge wire. The ignition lead is for sensing purposes only.

The wires will be colored coded as follows:

- Red for battery direct
- Yellow for ignition
- Black for ground

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.

- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to not be controlled by the load manager.
    - If enabled:
        - "Load Man Hi-Idle On" will display on the information center.
        - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
    - ON = not shed
    - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS
There will be four (4) rectangular halogen lights mounted in the front quad style, chrome housings on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS
There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

ADDITIONAL DIRECTIONAL LIGHT
There will be two (2) Whelen, Model 60A00TAR, amber LED populated arrow directional lights provided one each rear cab match 26298.

Each light will be surface mounted in a 15 degree angle bracket.

CAB CLEARANCE/MARKER/ID LIGHTS
There will be five (5) Truck-Lite amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) Truck-Lite, Model 19036Y, amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) Truck-Lite, Model 10006Y kit, amber LED beehive clearance/marker lights will be installed, one (1) on each outboard side of the cab roof, above the windshield.

FRONT CAB SIDE CLEARANCE/MARKER LIGHTS
There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as clearance/marker lights with the headlight switch and directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING
There will be a three (3) LED light bar used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

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

The lights shall be mounted in a polished combination housing.

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

LICENSE PLATE BRACKET

There will be one (1) license plate bracket mounted on the rear of the body.

A white LED light will 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.

REAR STEP BUZZER
A buzzer button compartment will be installed at the rear of the body, on the driver's side. The rear step control will be a button installed into a handle control with a ten (10) foot length of coil cord and housed in a separate compartment with a latched, stainless steel door. A bolt on rubber bumper stop will be provided.

WARNING LIGHT FLASH PATTERN
The flash pattern of all the exterior warning lights will be set to meet the certified California, Title XIII flash pattern by either the light manufacturer's default flash pattern or by a conversion change to the certified flash pattern.

LIGHT, INTERMEDIATE
There will be one (1) pair, of Truck-Lite, Model: 30080Y flange mounted amber LED light kits will be furnished, one (1) each side of the rear fender panel, in place of the standard directional/marker intermediate light. The light will double as a turn signal and marker light.

This installation will include a stainless steel cover.

MOUNTING, RECESS LIGHT
There will be one (1) recessed pocket(s) for mounting light(s). The recessed pocket(s) will be provided passengers side rear. .

SPECIAL PROGRAMING OF LIGHTS
Battery on, ignition on or off, brake on, marker or headlights off;

No perimeter/ground/step lights on unless the corresponding door or compartment door is opened;

Then only specific lighting in the area of the open door;

The rear tailboard 45 degree lights will come on with the R1 compartment door. The PS 45 dgree light will come on with the P1 compartment door. The DS 45 degree light will come on with the D1 compartment door.

Battery on, ignition on or off, brake on, and marker or headlights on ;

All ground/step lights on;

License plate light is to be treated as a step light when appropriate conditions are met;

Pump panel lights switchable on/off with headlights on and parking brake released. A parking brake interlock will not be provided for the pump panel lights.

CAB PERIMETER SCENE LIGHTS
There will be four (4) Truck-lite, Model 44308C, 4.00" white LED lights with Model 40700 grommets provided, one (1) for the cab and 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.

PERIMETER SCENE LIGHTS, BODY
There will be a total of four (4) Truck-Lite, Model 44308C, LED lights provided on the apparatus. Each light will consist of a 4.00" weatherproof LED light, rubber mount, and pigtail kit.

The lights will be mounted in the following locations:

- Two (2) lights will be provided under the rear body adjacent to the fuel tank.The lights will be mounted at a 45 degree angle to help to illuminate the sideand rear areas.

- One (1) light will be provided under the driver side running board

- One (1) light will be provided under the front corner of the passenger side of thebody. This light will be mounted at a 45 degree angle to shine light towards theside as well as the passenger side running board.

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

The lights will be activated in the following special manner:

-When the battery switch is "on", the brake is "on", and marker lights are off, thenno perimeter lights will be "on" unless the compartment door is opened. Allunderbody lights only on the side of the body corresponding with the open doorwill activate. The rear compartment door will control the rear (2) perimeterlights.

STEP LIGHTS
There will be two (2) white LED step lights will be provided at the rear to illuminate the tailboard/step area.

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.

These step lights will be actuated with the perimeter scene lights.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

12 VOLT LIGHTING
There will be one (1) light assemblies installed on the apparatus, passenger side rear of cab.

The light head(s) will be Whelen®, Model PCP2P*, 12 volt DC LED combination flood/spot light with pole mount, mounting plate, handle and hardware kit. There will be a Whelen, Model PADPTH, pole adapter and a 15 foot coil cord provided.

The painted parts of this light assembly to be white.

The pole(s) will be ROM, Model KR-SB-500-W2P, side mount, push up pole.

A control for the light(s) selected above will be the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- no additional switch location
- no additional switch location

The light(s) will be connected to the Do Not Move Truck Indicator circuit.

These light(s) may be load managed when the parking brake is set.

The handles shall be removed from the lightheads located [Location].

12 VOLT LIGHTING

There will be one (1) light assemblies installed on the apparatus, driver side rear of cab.

The light head(s) will be Whelen®, Model PCP2P*, 12 volt DC LED combination flood/spot light with pole mount, mounting plate, handle and hardware kit. There will be a Whelen, Model PADPTH, pole adapter and a 15 foot coil cord provided.

The painted parts of this light assembly to be white.

The pole(s) will be ROM, Model KR-SB-500-W2P, side mount, push up pole.

A control for the light(s) selected above will be the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- no additional switch location
- no additional switch location

The light(s) will be connected to the Do Not Move Truck Indicator circuit.

These light(s) may be load managed when the parking brake is set.

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP1, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA103 located one each side upper rear body.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

a switch at the driver's side switch panel

no additional switch location

no additional switch location

a switch in a stainless steel cup located at the rear no more than 62.00" from the ground

These light(s) may be load managed when the parking brake is set

HOSE BED LIGHTS

There will be white 12 volt DC LED light strips with stainless steel protective cover, provided to light the hose bed area.

- One (1) light strip will be installed the entire length of the driver's side of the hose bed.
- One (1) light strip will be installed the entire length of the passenger's side of the hose bed.

The lights will be activated by a switch located at the pump operator's panel.

DOOR SWITCHES

There will be four (4) momentary switches installed in the overhead switch panel.

- Two (2) switches, one labeled "FRONT DOOR" and the other labeled "REAR DOOR" on the driver side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.
- Two (2) switches one labeled "FRONT DOOR" and the other labeled "REAR DOOR"on the officer side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.

Two power output wires and two ground wires will be supplied to the junction box.

The output wires will be terminated in one (1) 9.45" x 6.30" x 3.54" polycarbonate junction box painted job color installed on the roof at the splice box located on the cab roof.

WATER TANK

Booster tank will have a capacity of 500 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that is 8.00" long x 8.00" wide x 6.00" deep will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

The water tank fill dome will be located driver's.

The water level transducer will be located on the front wall of the water tank as low and as close to the passenger's side as practical.

One (1) sleeve will be provided in the water tank for a 3.00" pipe to the rear.

HOSE BED

The hose bed will be fabricated of 12-gauge galvanneal steel.

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

Hose bed width will be minimum of 68.00" inside.

Upper and rear edges of side panels will have a double break for rigidity, a split tube finish will not be acceptable.

The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.

Hose bed will accommodate 900' of 4",750' of 2.5" and 200' of 2.5".

HOSE BED DIVIDER

Two (2) adjustable hosebed dividers will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.

Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

A cross-divider will be provided 46 inches from the front wall of the body . The divider will be bolted to the side sheet.

HOSE DEFLECTOR

A 4.00" deep aluminum treadplate hose deflector will be provided at the rear of the hosebed above the handrail. This deflector will extend 4.00" to the rear and have an angle support.

HOSE BED COVER

A four (4) section hose bed cover, constructed of .125" bright aluminum treadplate will be furnished. The cover will be split into front and rear with each section having a left and right side. Each section will be attached with a full length stainless steel piano hinge. The sides will be slanted down with the

center of the cover supported by a stationary bridgework support. An additional bridge support will be required at the middle of the cover where the front and rear sections are divided.

All sections of the cover will be reinforced so that it can support the weight of a man walking on the cover.

Chrome grab handles and gas filled cylinders will be provided to assist in opening and closing the cover. A handrail is to be provided at the rear, in the center of the support, to assist in opening the cover. A DuraSurf™ center strip will be supplied to prevent chaffing at the center of the cover.

A red flap made of Sunbrella material will be installed on the rear of the bright aluminum treadplate hose bed cover. A chain weight and paddle seat belt buckles will be provided along bottom edge of the cover. The web/seat belt straps will be 6.00" in length so that they are approximately 3.00" in length when doubled over. The top edge of the cover will be secured to the hose bed structure with quarter-turn fasteners.

Note: The buckles will not be mounted to the hosebed divider mount.

RUNNING BOARDS

Running boards will be fabricated of .125" bright aluminum treadplate.

Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure.

Running boards will be 12.75" deep and spaced .50" away from the pump panel.

A splash guard will be provided above the running board treadplate.

TAILBOARD

The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The rear cross bracing for the tail board step will be four (4)1" x 2" rectangular aluminum tubes. This will allow the rear step to be lowered 1/2" to meet NFPA rear step height.

The tailboard area will be 16.00" deep and full width of the body.

The exterior side will be flanged down and in for increased rigidity of tailboard structure.

Beavertails will not be provided.

REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL

The rear facing surfaces of the center rear wall will be smooth aluminum.

The bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body.

TOW BAR

A tow bar shall be installed under the tailboard at center of truck 2.00" in from the rear of the tailboard.

Tow bar shall be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly shall be constructed of .38" structural angle. When force is applied to the bar, it shall be transmitted to the frame rail.

Tow bar assembly shall be designed and positioned to allow up to a 30 degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

Tow bar design shall have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

Morton Cass will be inserted in the driver side running board.

Morton Cass will be inserted in the tailboard.

HOSE TRAY

One (1) hose tray will be recessed in the passenger side running board.

Capacity of the tray will be 200' of 1".

Rubber matting will be installed on the floor of the tray to provide proper ventilation.

A hinged bright aluminum treadplate cover will be provided for the tray with a lift and turn latch door latch.

Drain holes will be provided .125" off all (4) four of the corner side walls of the tray.

HOSE TRAY COVER HOLD OPEN DEVICE

A gas shock Part # 80-4169 shall be provided to hold open the running board hose tray cover no more than 10.00".

COMPARTMENTATION

Body and compartments will be fabricated of galvanneal steel.

Side compartments will be an integral assembly with the rear fenders.

Circular fender liners will be provided for prevention of rust pockets and ease of maintenance.

Compartment flooring will be 12 gauge and of the sweep out design, with the floor higher than the compartment door lip.

The compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.

Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate, or polished stainless steel.

The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear, and outward side. These covers will have the corners TIG welded.

Side compartment covers will be separate from the compartment tops.

Front facing compartment walls will be covered with bright aluminum treadplate.

All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper, a method of body and compartment support suitable for the intended load will be provided.

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

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a floating substructure, which results in a 500 lb equipment support rating per lower compartment.

The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

The isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

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

Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN

Body structural analysis 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 cab, body and substructure.

The body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00", simulating the twisting a truck may experience when driving over a curb.

- Making a 90 degree turn while at 20 mph, simulating aggressive driving conditions.

- Driving the vehicle at 35 mph on a washboard road.

- Driving the vehicle at 55 mph on a smooth road.

- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph, on rough pavement.

Evidence of actual testing techniques will be made available upon request.

COMPARTMENTATION, DRIVER'S SIDE

A full height, roll-up door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 66.13" high x 25.88" deep. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 30.00" wide x 58.25" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 58.25" wide x 25.12" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 31.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 28.75" wide x 58.25" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

COMPARTMENTATION, PASSENGER'S SIDE

A full height, roll-up door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 66.13" high x 25.88" deep. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 28.75" wide x 58.25" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 58.25" wide x 25.12" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 31.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment will be measured from compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 28.75" wide x 58.25" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

ROLLUP DOOR, SIDE COMPARTMENTS

There will be six (6) compartment doors installed on the side compartments. The doors will be double faced aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by A&A Manufacturing (Gortite).

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

A polished stainless steel lift bar with locking key latches to be provided for each roll-up door. The keys to be Model J236 for all compartment doors. Lift bar will be located at the bottom of door and have

latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Doors will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surfaces will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

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

COMPARTMENTATION, REAR

A rollup door compartment above the rear tailboard will be provided.

Interior dimensions of this compartment will be 40.00" wide x 47.38" high x 25.88" deep in the lower 38.75" of height and 15.75" deep in the remaining upper portion. Depth of the compartment will be calculated with the compartment door closed.

A louvered, removable access panel will be furnished on the back wall of the compartment.

Rear compartment will be open into the rear side compartments.

Clear door opening of this compartment will be 33.25" wide x 38.75" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

ROLLUP DOOR, REAR COMPARTMENT

There will be a rear rollup door. The door will be double faced aluminum construction, an anodized satin finish and manufactured by A&A Manufacturing (Gortite).

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

A polished stainless steel lift bar with locking key latches to be provided for each roll-up door. The keys to be Model J236 for all compartment doors. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Door will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surface will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

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

SCUFFPLATE
A full-height angled stainless steel scuffplate will be furnished on the passenger's side front outside corners of the body. It will be lapped over the front compartment bulkhead treadplate and wrap the front corner of the compartment to protect the corner from crosslay and booster hose.

SCUFFPLATE
A stainless steel scuffplate will be furnished. The scuffplate will be installed and wrap the corners of the inside edge of the offset rear ladder rack arm on the hose bed edge.

DOOR GUARD
seven (7) compartment doors will include an L-shaped guard designed to protect the bottom and interior side of the roll-up door from damage when in the retracted position and contain any water spray while the door is being opened. The guard will be fabricated from stainless steel and installed all doors .

ELECTRIC DOOR LOCKS
There will be seven (7) door(s) located on the body equipped with electric locks. The locks will be wired battery direct. The switch for control will be located on the pump panel. In the event of loss of power, a manual override is available.

ELECTRIC DOOR LOCKS
The lock switch at the pump panels shall be positioned so that switch will trigger the locks when pushed toward the red label.

ROLL-UP DOOR TRIM
The exterior of the aluminum trim around the door opening will be painted job color.

There will be six (6) compartments with the trim painted.

COMPARTMENT LIGHTING
There will be seven (7) compartments with On Scene Solutions LED compartment light strips. The strips will be centered vertically along each side of the door framing. The compartments with these strip lights will be located body compartment doors. .

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

WORK LIGHTS, RECESSED IN COMPARTMENT SIDE WALL
Additional 4.00" diameter lighting will be provided in the compartments. They will be recessed within the side walls of one front and one on the rear hatch compartment walls.

The total quantity of additional 4.00" lights recessed in the compartment side walls will be two (2) lights.

ACCESS PANEL

A bright aluminum treadplate access plate will be provided in the dunnage area floor for access to the pump. Access will be as large as possible. Recessed lift and turn latches will be provided.

Access panel is to be located above the pump on the driver's side

CARGO FLOOR

The cargo floor will be recessed to allow for a hose reel to be mounted and have proper clearance.

MOUNTING TRACKS

There will be seven (7) sets of tracks for mounting shelf(s) in all body compartments.. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be nine (9) shelves with a capacity of 215 lb provided. The shelf construction will consist of .125" 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 corners of the shelf will be welded.

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

The location will be 1 at compartment brake in compartments P1,1 in P2, P3,D1 & D3. 1 lower in D1. 1 ,P1 & P3 lower full depth area of compartment on hyd ladder rack cover. 1 in R1 Match 25333.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray with 2.00" sides provided [Location]. Each tray will be rated for up to 200lb in the extended position. The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior.

Slides will be equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

BACKBOARD STORAGE

A transverse area over the pump and forward of the crosslays will hold two (2) storage troughs.

A blister will be supplied at each side to enclose the backboards due to their length.

The backboards will be accessible from either side of the vehicle through the polished stainless steel door(s) with a pair of lift and turn latches.

The size of the backboard(s) to be stored will be match 28068 .

TREADPLATE TOPPED STORAGE BOX
There will be one (1) painted stainless steel box(s) provided on top of the driver's side compartmentation with two (2) aluminum treadplate, single pan, lift-up doors. The doors will be hinged on the outboard side extending in an L-shape over the edges of the compartment to increase weather resistance and with flush mount pawl latches. The doors will have rubber covered chains to allow the door to stay open. The box will be 9.00" wide x 10.00" deep x 136.00" long.

There will be a full length white LED rope light installed on the inside edge of the compartment.

NO HORIZONTAL TRACKS
The compartments over the rear wheels will not have any type of horizontal tracks installed on the rear wall that is used as a stiffener.

MATTING, COMPARTMENT FLOOR
Turtle Tile compartment matting will be provided in seven (7) compartments on the compartment floor. The locations are, lower compartments.

The Turtle Tile will be red and the leading edge of the matting will include the beveled edge. The beveled edge will be red .

MATTING, COMPARTMENT SHELVING
Turtle Tile compartment matting will be provided in ten (10) shelves. The locations are, all shelves, .

The color of the Turtle Tile will be red.

PARTITION, TRANSVERSE REAR COMPARTMENT
Two (2) partitions will be bolted in place to separate driver and passenger side rear compartments from the rear tailboard compartment.

TOOL BOX
A Respond Ready heavy duty drawer system with four (4) drawers will be installedleft front compartment .

The drawer system will consist of one (1) flat top shelf, side panels with 1/2 inch risers, heavy duty 500lb. slides, single handle latching hardware, powder coated front panels and galvanized components.

The unit will be painted red.

The drawers will be configured in a drawer system measuring 25.7" H x 28.00" W x 24.70" D exterior dimensions.

Drawers will consist of one (1) 3.00 inch drawer, one (1) 5.00 inch drawer, one (1) 7.00 inch drawer, and one (1) 9.00 inch drawer.

Each drawer will contain four (4) dividers.

RUB RAIL
The bottom edge of the side compartments will be trimmed with a bright stainless steel rub rail. The rub rail will be 2.00" high and extend 1.00" away from the body, with slanted ends to provide a pleasing appearance.

These 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 installed between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

HARD SUCTION HOSE
Hard suction hose will not be required.

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

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

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

Handrails will be provided to meet NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.

One (1) vertical handrail, not less than 29.00" long, will be located on the driver side rear beavertail.

Two (2) horizontal knurled handrails will be below above the hose bed at the rear of the apparatus match 28068 .

AIR BOTTLE STORAGE INSERT
A total of one (1) inserts shall be provided for the air bottle storage compartments.

The inserts shall be a "4.00 beveled " wedge made out of poly-propylene to separate the bottles.

AIR BOTTLE STORAGE (DOUBLE)
A quantity of one (1) air bottle compartment, 15.25" wide x 7.75" tall x 26.00" deep, will be provided on the driver side forward of the rear wheels . A brushed 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.

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 passenger side forward of the rear wheels and on the passenger side rearward of the rear wheels. A brushed 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 a 24', two-section, aluminum, Duo-Safety, Series 900-A extension ladder provided.

ROOF LADDER

There will be a 14' aluminum, Duo-Safety, Series 775-A roof ladder provided.

HYDRAULIC LADDER RACK DUAL ACTUATORS

Ground ladders will be mounted above the right side of the hose body in a specially designed swing-down cradle. This cradle will be electric/hydraulic operated. The system design will have been life cycle tested for at least 14 years of dependable service.

An independent hydraulic pump powered by a 12-volt electric motor will operate the hydraulics. Operation of the hydraulic system for the ladder rack by an engine-powered pump will be totally unacceptable. The hydraulic pump and reservoir will be accessible from the ground through a stainless steel inspection door.

The ladder rack will incorporate two hydraulic rotary actuators, one each located inside the front compartment and the rear compartment. The actuators will be completely enclosed within each compartment to eliminate any pinch points while operating the ladder rack. Lifting arms will be attached outside the compartment body to the front and rear actuator. A center-lifting arm built into the compartment space is unnecessary and is unacceptable.

The rack can be designed in certain situations to provide lifting capabilities up to 500lbs.

The maximum height of the rack from the ground in the lowered position will be no more than 47.00".

The electric control panel will have a master switch on/off switch, an actuation switch, an operation indicator light and operation instructions. The electric controls will be located in such a manner to allow the operator full view of the area into which the ladders will be lowered.

Two (2) air operated safety locks will be furnished to securely maintain the ladder bracket assembly in the travel position. These air operated safety locks will be controlled from the ladder rack control panel.

Ladders will be secured to the brackets with two (2) locks retaining the roof ladder and the extension ladder. The locks will be such that when the roof ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place.

LADDER RACK INTERLOCK AND NOT STOWED INDICATOR LIGHT
An interlock will be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated.

A steady red indicator light will be located on the cab instrument panel and illuminated when the hydraulic ladder rack is not in the stowed position. The light will be labeled "Ladder Rack". In addition, the "Do Not Move Apparatus" light located in the cab will be activated when the hydraulic ladder rack is not in the stowed position.

LIGHTS, FLASHING, HYDRAULIC LADDER RACK
Flashing amber lights facing the front and rear will be provided on the ladder rack and activated whenever the rack is in the down position.

FOLDING LADDER
One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder will be installed on the hydraulic ladder rack.

The rear ladder rack arm will have an offset to not block the rear upper zone warning lights.

PIKE POLE, 6 FOOT
One (1) pike pole, 6 foot long Nupla, with a fiberglass I-beam handle, will be provided and located on the ladder rack to match 26298.

6' PIKE POLE
One (1) pike pole 6' long RH-6DA Nupla ventilation hook(s) with an aluminum D-grip handle will be provided and located on the ladder rack with the tines forward, with two LPVM-5 mounts per photo of 26298.

PIKE POLE, 10 FOOT
One (1) pike pole, 10 foot long Nupla, with a fiberglass I-beam handle, will be provided and located on the ladder rack to match 26298 Photo's.

PIKE POLE 8 FT, PROVIDED BY DEALER
NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) 8 ft or longer pike pole mounted in a bracket fastened to the apparatus.

The pike pole is not on the apparatus as manufactured. The dealer will provide and mount the pike pole.

PIKE POLE STORAGE
There will be four (4) Zico, Model LPVM-5, low profile pike pole mounting bracket(s) used for pike pole storage and located on the ladder rack to match 26298, rubber ring used at the frontof the two pike poles and two mounts for the Vent Hook. Per photos of 26298.

LABEL IN CAB
A label, indicating "Fuel Prime After Filter Change Only" will be provided next to the fuel primer switch in the cab.

STEPS
A South Park LFS-46 folding step will be provided on the front of each fender compartment. The step will be fastened using grade 8 button style bolts.

REAR STEPS
Folding, model South Park LFS-46, steps will be provided at the rear with a stainless steel scuffplate that extends 6.00" above the folding step. All steps will provide adequate NFPA surface for stepping.

All folding steps will have Grade 8 "Button Style" fasteners.

I-ZONE BRACKETS
Two (2) slide-out I-Zone brackets will be provided and mounted at the rear of the apparatus recessed into compartmentation on top of the body compartments install same as 26298 . The brackets will slide out approximately 8.00" from the body in the deployed position. There brackets will have pin holes located along there length allowing them to be deployed and stowed in a secured position. The pin will be attached to a chain with the chain mounted on the wall near the bracket. The brackets will be constructed of .75" aluminum tubing at minimum. The brackets will be designed with adequate reinforcement to eliminate flexing of the body (oil canning) and not interfere with any of the rear facing zone lights when carrying hose.

MIDSHIP FIRE PUMP

Midship fire pump will be a Hale QMAX-150, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharges at the pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.

- 100% of rated capacity at 165 psi net pump pressure.

-70% of rated capacity at 200 psi net pump pressure.

-50% of rated capacity at 250 psi net pump pressure.

Entire pump and both suction and discharge passages will be hydrostatically tested to a pressure of 500 psi.

Pump will be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the current NFPA 1901 standards and will be free from objectionable pulsation and vibration.

Pump body and related parts will be of fine grain, alloy cast iron with a minimum tensile strength of 30,000 psi (2041.2 bar).

All moving parts in contact with water will be of high quality bronze or stainless steel.

Pump body will be horizontally split, on a single plane in two (2) sections, for easy removal of entire impeller assembly, including wear rings and bearings from beneath the pump, without disturbing pump piping or the mounting of the pump in the chassis.

Pump will have one (1) double suction impeller. The pump body will have two (2) opposed discharge volute cutwaters to eliminate radial unbalance.

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

Impeller clearance rings will be bronze and easily renewable without replacing impeller or pump volute body. They will be of the wrap-around double labyrinth design for maximum efficiency. Pump shaft will be electric furnace heat-treated, corrosion resistant stainless steel. It will be super-finished under packing with galvanic corrosion (zinc separators in packing) protection for longer shaft life. Pump shaft will be sealed with double oil seal to keep road dirt and water out of drive unit.

Pump shaft will be rigidly supported by three (3) bearings for minimum deflection. A high lead bronze sleeve bearing will be located immediately adjacent to the impeller (on the side opposite of the drive unit). The sleeve bearing will be automatically oil lubricated and pressure balanced to exclude foreign

material. The remaining bearings will be heavy-duty, deep groove ball bearings in the gearbox and will be splash lubricated.

MECHANICAL SEAL ON PUMP

Only one (1) mechanical seal is used on the suction (inboard) side of the pump.

The mechanical seal will be two 2.00" in diameter and will be spring loaded, maintenance-free, and self-adjusting.

The mechanical seal construction will be a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat with a Teflon backup seal.

PUMP TRANSMISSION

The drive unit will be cast and completely manufactured and tested at the Hale Products, Inc. factory. The pump drive unit will be of sufficient size to withstand up to 16,000 foot/ pounds of torque from the engine in both the road and pump operating conditions. The drive unit is will be designed with ample lubrication reserve to maintain the proper operating temperature.

The gearbox drive shafts will be of heat treated chrome nickel steel and 2.75" in diameter on both the input and output drive shafts. They will be designed to withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, will be of the highest quality, electric furnace, chrome nickel steel. Bores will be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design will be provided to eliminate all possible end thrust.

Pierce Manufacturing will select the pump ratio to provide the maximum performance with the engine and transmission selected. Three (3) green warning lights will be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two (2) lights will be located in the truck driving compartment and one (1) light on pump operator's panel adjacent to the throttle control.

AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located to the left side of the steering column. A manual back-up shift control will also be located on the drivers side pump panel.

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

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

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

TRANSMISSION LOCK-UP

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

AUXILIARY COOLING SYSTEM

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

INTAKE RELIEF VALVE

An Elkhart relief valve will be installed on the suction side of the pump preset at 250 psig.

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

Outlet will terminate below the left side, visible to the operator, with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.

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

A 2.50" full flow valve with chrome plated handle will be installed after the pump intake relief valve. This valve will be controlled from inside the pump compartment through the above mentioned door. The valve will be positioned so when the valve control is in the closed position the door will not close.

RELIEF VALVE WITH INDICATOR LIGHT

Pump will be equipped with a Hale automatic pressure control device.

A single bronze, variable pressure setting relief valve will be provided and be of ample capacity to prevent an undue pressure rise, as per NFPA pamphlet #1901.

Relief valve will be normally closed and will open against pump pressure. This relief valve will include a control light to signal when the valve is open.

In the event of relief valve control failure, the pump will remain operable for the complete range of the pump's rated capacity, without requiring the closing of any emergency (off/on) valves.

HALE ESP PRIMING PUMP

Priming pump will be a positive displacement vane type, electrically driven, and conforming to standards outlined in NFPA pamphlet #1901.

One (1) priming control will both open the priming valve and start the priming motor.

Primer will be environmentally safe, self lubricating style.

RECIRCULATING LINE WITH CHECK VALVE
A 0.50" diameter recirculating line, from the pump to the water tank, will be furnished with a control installed at the pump operator's control panel. A check valve will be provided in this line to prevent the back flow of water from the tank to the pump if the valve is left in the open position.

PRIMING PUMP SPECIAL LOCATION
The pump primer motor will be located on drivers side frame on a bracket fastened to the frame rail.

RELIEF VALVES TEE'D INTO SINGLE CONTROL VALVE

The pump intake relief valve and rear intake relief valves shall be tee'd into a single control dump valve at the lower pump panel with a single access door. The control handle for the dump valve will protrude into the door opening when the handle is in the open position.

PUMP SHIFT CABLE ROUTING
The pump shift cable will be clamped and routed in the shortest and most efficient way possible, for ease of operation.

THERMAL RELIEF VALVE
A Hale TRV120-L thermal protection device will be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 120 Degrees F (49 C).

The thermal protection device will include a red warning light and audible alarm. The warning light with a test switch will be mounted on the pump operator panel.

The discharge line will be 3/8 inch diameter tubing plumbed to ground.

PUMP MANUALS
Two (2) pump manuals from the pump manufacturer will be furnished in compact disc format with the apparatus. The manuals will cover pump operation, maintenance, and parts.

PLUMBING
All inlet and outlet plumbing, 3.00" and smaller, will be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. If hose is used, it must have a minimum burst rating of 1,000 psi and be equipped with high pressure couplings. Larger inlets and outlets will be threaded or welded black iron pipe. Small diameter secondary plumbing such as drain lines will be stainless steel, brass or hose.

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

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

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

MAIN PUMP INLETS
A 6.00" pump manifold inlet will be provided on the passenger's side of the vehicle only. The suction inlet will include a removable die cast zinc screen that is designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

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

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

INLET BALL VALVES
One (1) butterfly valve Task Force Tips ball intake valve will be installed on the the driver's side main pump inlet main pump inlets. The valves will be located outside the pump panel. The intake valve will have a 4.00" FNSTconnection by 6.00" female NST swivel.

Valves will be manually actuated, with a top handwheel.

PUMP SUCTION TUBES
The passenger side suction tube on the mid-ship pump will have a short suction tube to allow for installation of an adapter without excessive overhang.

The suction tube on the driver side will extend 4.50" past the side pump panel.

VALVES
All ball valves will be Akron® Brass. The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves will have a **ten (10) year** warranty.

LEFT SIDE INLET
On the left side pump panel will be one (1) - 2.50" auxiliary inlet, terminating in 2.50" National Standard Hose Thread. The auxiliary inlet will be tee'd into the tank to pump line and will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET
On the right side pump panel will be one (1) - 2.50" auxiliary inlet, terminating in 2.50" National Standard Hose Thread. The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

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

ANODE, INLET
A pair of replaceable sacrificial .75" magnesium anodes will be provided in the water pump to protect the pump from corrosion. One (1) will be placed in the inlet side of the pump and the other in the discharge side of the pump.

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

LARGE DIAMETER REAR INLET
A 4.00" inlet rear inlet with screen will be provided using 4.00" plumbing and a 4.00" butterfly valve.

The screen will provide cathodic protection against corrosion in the piping.

The piping will contain only large radius elbows, no mitered joints.

The plumbing will be routed to the rear, below the tee section of the water tank and will be plumbed directly into the back of the pump. The inlet will terminate beside the rear compartment, above the tailboard, on the passenger's side.

A bleeder valve will be located at the threaded connection.

REAR INLET ELBOW
The rear inlet will have a 4.00" (F) national standard thread x 4.00" (F) national standard thread swivel adapter, 30 degree elbow.

REAR INLET ADAPTER & PLUG
The rear inlet will have a (F) 4.00" national standard thread and 4.00" (F) national standard swivel and a 4.00" (M) national standard threaded plug and vinyl covered cable.

The plug will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected. The plug will be supplied with a 28.00" long vinyl coated air craft cable secured to the plug and the rear inlet garnish ring (no exception).

REAR INLET CONTROL
The rear inlet valve will have a chrome plated hand wheel control located at the pump operator's panel. A light will be provided to indicate when the valve is closed.

INTAKE RELIEF VALVE
An intake relief valve, preset at 250 psig, will be installed on the inlet side of the valve.

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

Outlet will terminate below the frame rails.

A 0.75" bleeder will be provided.

INLET BLEEDER VALVE
A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

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

The control on the pump panel will be "in" when the valve is open and "out" when the valve is closed.

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

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

LEFT SIDE DISCHARGE OUTLETS
There will be one (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with 2.50" (M) National Standard hose thread adapter.

RIGHT SIDE DISCHARGE OUTLETS
There will be two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

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

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

REAR DISCHARGE OUTLET
There will be one (1) discharge outlet piped to the rear of the hose bed, through the compartment driver's side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing will consist of 4.00" piping along with a 4.00" full flow ball valve with the control from the pump operator panel.

DISCHARGE OUTLET (REAR)
There will be one (1) discharge outlet piped to the rear of the hose bed through a compartment passenger side rear. Proper clearance will be provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. The one (1) discharge outlet will terminate with a 2.50" male National Standard hose thread male adapter.

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

The caps will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDERS

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

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

LEFT SIDE OUTLET ELBOWS

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

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

RIGHT SIDE OUTLET ELBOWS

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

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

REAR OUTLET ELBOWS

The rear 4.00" outlet will be furnished with a 4.00" (F) National Standard hose thread x 4.00" (M) National Standard hose thread elbow with long handle cap.

Elbows will be provided for one (1) discharge outlet.

ADDITIONAL REAR OUTLET ELBOWS

The 2.50" discharge outlets, located at the rear of the apparatus, will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

LARGE DIAMETER OUTLET ELBOWS

The 4.00" outlet will be furnished with a 4.00" (F) National Standard hose thread x 4.00" (M) National Standard thirty (30) degree chrome elbow adapter with a chrome rocker lug cap.

REDUCER
There will be four (4) adapters with 2.50" FNST x 1.50" MNST threads and a 1.50" chrome plated cap installed on for each 2.5" outlet .

DISCHARGE DRAIN VALVES
Provide a manual style drain in all low plumbing points that would normally have automatic drains.

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

If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

DELUGE RISER
A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. The height of the piping will be match 26298. Piping will be installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel. The outlet will include an Akron valve with a handwheel control.

MONITOR
An Akron Model 3431 Apollo Hi-Riser monitor will be properly installed on the deluge riser.

Included will be a fixed mounting base and a portable base with 4" NST inlet, streamshaper and stacked tips.

The monitor will be painted to match the body.

A position sensor will be provided on the monitor that will activate the "do not move vehicle" light inside the cab when the monitor is in the raised position.

MONITOR NOZZLE
An Akron Brass model 1757 nozzle will be provided.

The deluge riser will have a 3.00" four (4)-bolt flange for mounting the monitor.

CROSSLAY HOSE BEDS
Three (3) crosslays with 1.50" outlets will be provided. Each bed to be capable of carrying 200 feet of 1.75" double jacket hose and will be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

The crosslays will be a maximum of 72" above the ground.

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

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

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

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

Crosslay bed flooring will consist of removable perforated brushed aluminum.

HOSE RESTRAINT SIDES

One (1) end skirt made of Sunbrella material will be provided on each side of the crosslay/speedlay/deadlay hose beds to secure the hose during travel. Each end skirt will be a single piece with seat belt buckle style latches at the top and Velcro strap pull releases at the bottom. The Velcro straps will be approximately 9.00" in length.

Color will be red

CROSSLAY COVER

A bi-fold aluminum treadplate cover, hinged at the front will be installed over the top of the crosslay/deadlay(s). It will include a latch at each end of the cover to hold it securely in place, a chrome grab handle at each end for opening and closing the cover and a foam rubber gasket where the cover comes into contact to a painted surface. The cover will be provided with no stay arm device hold open device.

CROSSLAY ROLLER

A stainless steel roller will be mounted horizontally across the bottom of each crosslay bed to aid in hose removal.

CROSSLAY ROLLERS

A stainless steel roller will be mounted vertically on the rear of the crosslay opening to aid in hose removal.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel will be installed over the pump in a recessed open compartment on the right side of the apparatus.

The exterior finish of the reel will be painted job color matching the body exterior.

A polished stainless steel roller and guide assembly will be mounted on the reel side of the apparatus.

Discharge control will be provided at the pump operator's panel. Plumbing to the reel will consist of 1.50" Aeroquip hose and a 1.50" valve.

Reel motor will be protected from overload with a sized automatic reset circuit breaker.

An electric rewind control switch will be installed on the reel side pump panel.

Booster hose, .75" in diameter and 175' in length, with chrome plated Barway or equal couplings will be provided.

The working pressure of the booster hose will be a minimum of 800 psi.

Capacity of the hose reel will be 175 feet of .75" booster hose.

HOSEREEL ACCESS

A cutout will be provided in the side sheet next to the booster hose reel. This cutout will allow access to the hose and provide a window to view the reel. Stainless steel rollers with nylon bushings will be mounted horizontally and vertically around the cutout. The side rollers will be kept approximately 1.25" shorter than the opening in order to mount the top roller farther into the opening to prevent the hose from hitting the pumphouse before the roller.

An extra roller will be mounted on the back side of the side sheet in the top position to protect the roller from the edge of the side sheet.

A manual rewind will be provided for the booster hose reel.

FOAM CONCENTRATE PROPORTIONING SYSTEM

A Hypro FoamPro®, Model 2002, foam system will be provided as the means for the proportioning of foam concentrate into the water stream. The FoamPro is an electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system.

This system will be a single agent system capable of handling Class A foam concentrates, as well as most Class B foam concentrates.

The foam system will be plumbed to six (6) discharges. The discharges capable of dispensing foam will be three crosslays, right side front PS pump panel, rear 2.5" and the booster reel. Default foam concentration level to be 0.3%.

The foam proportioning system operation will be based on a direct measurement of water flows, and remain consistent within the specified flow and pressure. The system will be equipped with a digital electronic control display on the pump panel. Incorporated within the control display will be a microprocessor, which receives input from the system flow meter while also monitoring the foam concentrate pump output. The microprocessor will compare the values of the water flow versus the foam flow, to ensure the proportion rate is accurate.

One (1) paddle wheel will be installed to monitor all foam discharges.

Push button control for the form proportioning rate will allow a ratio from .1 percent to 3 percent in .1 percent increments.

The rated capacity of this system will be 166 gpm at 3 percent and 1000 gpm at .5 percent.

A 5 gpm positive displacement foam pump will be powered by a 12 vdc electric motor.

One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump. The check valve will be approved by the foam system manufacturer.

LOCATION, FLOW SENSOR

The Foam Pro flow sensor will be facing forward to allow easy access.

FOAM TANK
The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 40 gallons of foam with the intended use of Class A foam. The brand of foam stored in this tank will be monsanto PHoschek WD881 . The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN
The foam tank drain will be a 1.00" drain valve located inside the pump compartment accessible through a door on the passenger's side pump panel.

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

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

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

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

PUMP CONTROL PANELS (SIDE CONTROL)
All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly marked.

The pump panel on the right (passenger's) side is removable with lift and turn type fasteners. The left (driver's) side is fastened with screws.

The control panels will be 48.00" wide.

The gauge and control panels will be two (2) separate panels for ease of maintenance.

The side gauge panel will be hinged at the bottom with a full length stainless steel hinge. The fasteners used to hold the panel in the upright position will be quarter turn type. Vinyl covered cable or chains will be used to hold the gauge panel in the dropped position.

Polished stainless steel trim collars will be installed around all inlets and outlets.

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

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

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

All line pressure gauges will be mounted in individual chrome plated castings with the identification tag recessed in the casting below the gauge. All remaining identification tags will be mounted on the pump panel in chrome plated bezels. Mounting of the castings and identification bezels will be done with a threaded peg cast on the back side of the bezel or screws.

PUMP PANEL CONFIGURATION

The pump panel configuration will be laid out per the following special instructions Match previous unit 26298 and reference the customer approved pump panel drawing in the job e-folders, stage 3 folder.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of stainless steel with a brushed finish. A polished aluminum trim molding will be provided on both sides of the pump panel.

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

PUMP COMPARTMENT LIGHTS

Two (2) pump compartment lights will be provided inside the pump enclosure and accessible through a door on the pump panel.

Lights will be switched on/off with the pump panel light switch.

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

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion:

INFORMATION CENTER

An information center employing a 7" diagonal color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees F
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display

OPERATION

The information center will be designed for easy operation for everyday use.

The page button will cycle from one screen to the next screen in a rotating fashion.

A video button will allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed will return the information center to the vehicle information screens.

A menu button will provide access to maintenance, setup and diagnostic screens.

All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used. If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition

Every screen will include the following:

- Exterior Ambient Temperature
- Time (12 or 24 hour mode)

Text Alert Center:

- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more then one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- Button Labels: A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text.

PAGE SCREENS

The Information center will include the following screens:

Load Manager Screen: A list of items to be load managed will be provided. The list will provide:

- Description of the load
- Individual load shed priority: The lower the priority number the earlier the device will be shed should a low voltage condition occur.
- Load Status: The screen will indicate if a load has been shed (disabled) or not shed.
    - "At a Glance" color features are utilized on this screen

Do Not Move Truck: The Do Not Move Truck screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:

- Driver Side Cab Door
- Passenger's Side Cab Door
- Driver Side Crew Cab Door
- Passenger's Side Crew Cab Door
- Driver Side Body Doors
- Passenger's Side Body Doors
- Rear Body Door(s)
- Ladder Rack (if applicable)
- Deck Gun (if applicable)
- Light Tower (if applicable)
- Hatch Door (if applicable)
- Stabilizers (if applicable)
- Steps (if applicable)

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause damage to the apparatus if the apparatus is moved, will cause an "Alert Center" message if the parking brake is disengaged.

Chassis Information: The following information will be shown:

- Engine RPM
- Fuel Level
- Battery Voltage
- Engine Coolant Temperature
- Engine Oil Pressure
    - "At a Glance" color features are utilized on this screen

Active Alarms List: This screen will show a list of all active text messages. The list items text will match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

MENU SCREENS

The following screens will be available through the Menu button:

View System Information: A detailed list of vehicle information:

- Battery Volts
- Pump Hours
- Transmission Oil Temperature
- Pump Engaged
- Engine Coolant Level
- Engine Oil Level
- Oil level will only be shown when the engine is not running
- Power Steering Level

Set Display Brightness:

- Brightness: Increase and decrease
- Default setting button

Configure Video Mode:

- Set Video Contrast
- Set Video Color
- Set Video Tint

Set Startup Screen:

- Choose the screen that will be active at vehicle power-up

Set Date & Time:

- 12 or 24 hour format
- Set time
- Set date

View Active Alarms:

- Shows a list of all active alarms
- Date and time of the occurrence is shown with each alarm
    - Silence alarms
        - All alarms are silenced

System Diagnostics:

- Module type and ID number
- Module version

Module diagnostics information:

- Input or output number
- Circuit number connected to that input or output
- Circuit name (item connected to the circuit)
- Status of the input or output
- Power and Constant Current module diagnostic information

Button functions and button labels may change with each screen.

PUMP PANEL CONTROLS

Master Pump Drain Control.

INFINITY PRO THROTTLE
A Fire Research model ET4000 series electronic remote throttle designed for modern fire fighting apparatus will be provided on the pump operator panel. The throttle will have an "Optical Eye" idle button which immediately returns the engine to idle when pushed.

AIR HORN BUTTON
An air horn control button will be provided at the pump operator's control panel. This button will be properly labeled and put within easy reach of the operator.

DRAINS, DRIVERS SIDE
The drains on the drivers side pump panel will be located to keep the area under the main pump inlet clear for customer installed piston intake valve.

HOSE REEL PRESSURE GAUGE
Provided will be one (1) Class 1 brand, 2.50" diameter pressure gauge for the booster hose reel(s). The gauge will be located at the pump operator's panel.

PUMP PANEL INFORMATION
Match 26298. The mike and speaker compartment will have 4.00" less height and the lower panel will be removable due to the 2010 exhaust changes. Lower panel will be secured with 1/4 truss heads and AVK mechanical fasteners..

ANGLED GAUGE PANEL
The pump master gauge panel will be mounted at an angle downward to improve visibility of the gauges.

SPECIAL LABEL
There will be three (3) special label/s provided and installed (3) Captain discharges. Each label will be worded as follows, Captain 2.5" discharge #1, captain 2.5" discharge #2, and Captain 4" discharge.

COLOR CODED NAME TAGS
There will be three (3) outlet discharges with special color coded name tags. These tags will be used for labeling the discharge pressure gauges, controls, outlets and drains. color coded tag colors can be our standard except for the pink and do not double up on colors. Match 26298, No. 1 driver to be Mint Green, Captain 2.5" #1 to be red, and Captain 2.5" #2 to be blue.

SPECIAL TAG
A special tag will be provided and installed Captian 2.5" Intake Captian 2.5" Discharge #1 (Towards front) Captian 2.5" Discharge #2 (towards Rear) Captian 4" Discharge Captain 4" Intake Rear 2.5" Discharge Rear 4" Intake .

The tag will read "- ".

GAUGES, VACUUM AND PRESSURE
The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1©.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

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

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

PRESSURE GAUGES

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

The gauges will be a minimum of 3.50" in diameter and will have white faces with black lettering.

Gauges will be compound type with a vacuum/pressure range of 30.00"-0-600#.

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

WATER LEVEL GAUGE

A Fire Research, Model WLA2000 series electric water level gauge will be provided on the operator's panel, that registers water level by means of 9 LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180 degree of clear viewing.

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

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

WATER LEVEL GAUGE

There will be two (2) additional water level indicator, Whelen®, Model PSTANK, LED module installed one each side of the cab.

This light module will include four (4) colored levels, and function similar to the water level indicator located at the operators panel:

- First green module indicates a full water level
- Second blue module indicates a water level above 3/4 full
- Third amber module indicates a water level above 1/2 full
- Last red module indicates a water level above 1/4 full and empty
    - Above 1/4 this light will be steady burning
    - At empty this light will be flashing

This module will be activated when the pump is in gear.

FOAM LEVEL GAUGE

An electric foam level gauge will be provided on the operator's panel, that registers foam level by means of nine (9) LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180 degree of clear viewing.

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

The level measurement will be ascertained by sensing the head pressure of the fluid in the tank or cell. This method provides accuracy with an array of multiviscosity foams.

LIGHT SHIELD

The pump panel controls and gauges will be illuminated by LED lights installed under a stainless steel light shield under the crosslays. An aluminum diamond plate combination step/gauge panel will be supplied for the 6.00" master gauges. The stepping surface will be a minimum of 8.00" deep and properly reinforced to support a man's weight.

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

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

Two (2) Whelen OS2, step lights shall be provided. The step light shall be installed as to illuminate the top of the step for night time vision. The step light shall be activated by the pump panel light switch.

NFPA 1901, 2009 edition, section 4.10.0 states that illumination shall be provided for controls, switches, instruction plates, gauges, and instruments necessary for the operation of the apparatus and the equipment provided. Per the fire department request not to have the pump panel light switch illuminated, unless the parking brake is set or the pump is engaged the apparatus shall be non-NFPA compliant at time of delivery.

ADDITIONAL LIGHT SHIELD

An additional polished, 16 gauge stainless steel light shield will be provided above passenger's side pump panel.

- There will be four (4) Fire Research Firefly, Model 115-Q01, white LED lights installed under the light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. The lights will be operated from a switch on the pump panel. Additional lights will be included every 18.00" depending on the size of the pump house.

MICROPHONE & SPEAKER COMPARTMENT

A microphone and speaker compartment with a polished stainless steel door will be incorporated into the pump operator's panel. Compartment size will be approximately 12.00" high x 9.00" wide x 6.00" deep.

AIR HORN SYSTEM
There will be two (2) Grover, air horns provided and located in the front bumper, recessed to the outside of the frames. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

AIR HORN CONTROL
The air horns 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 air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

AIR HORN SWITCHING
The air horns will be the default from the horn ring when the battery switch is turned on. The electric chassis horns will be secondary.

ELECTRONIC SIREN
A Unitrol, model UTM-1, electronic siren and PA system will be provided. A Unitrol, model UNCT, noise-canceling microphone will be provided with the siren amplifier.

The siren will have the following features:

- Switch types: rocker and toggle.

- Panel lighting: adjustable when dashboard lights are dimmed.

- Horn Ring control: Built-in, automatic polarity compensation.

- Short-circuit protection.

- Internal programming switches: Field-adjustable internal switches permit selection of siren sounds and functions to suit personal preferences or local laws.

- Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound after five (5) seconds.

- Kill: stops siren sound when parking brake is set.

- Lock: - Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound on demand when horn ring or manual switch is pressed again.

- Sweep: Siren continuously changes three (3) sounds every six (6) seconds. The sequence is started and stopped on demand by pressing the horn ring or manual switch once.

NFPA 1901, Section 13.9.1.1 requires the siren manufacturer to certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens*.

Per the fire department specification, the siren and siren speaker come from separate manufacturers and a certification is therefore invalid. The apparatus will be non compliant to NFPA 1901 standards at time of contract execution.

Siren head will be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket will be capable of rotating a minimum of 180 degrees.

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.

SPEAKER

There will be two (2) speakers provided. The speakers will mount to the outside of the frame rails. Each speaker will be a Cast Products, model SA2403, 100 watt, inside-the-bumper mount, with trim bezel. Each speaker will be connected to the siren amplifier.

There will be one (1) speaker recessed in the passenger's side and one (1) speaker recessed in the driver's side of the front bumper.

AUXILIARY MECHANICAL SIREN

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

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

A second siren brake switch will be installed on the passenger side.

The siren and traffic contoller will be mounted as close together as practical to optimize the driver's and officer's vision. Reference 19153.

WARNING LIGHTS

There will be one (1) 72.00" Whelen Delta Model DISF72-A, lightbar mounted on the cab roof.

This lightbar will include the following in the upper section:

- One (1) red flashing LED module in the driver's side rear corner position
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) red flashing LIN12 LED module in the driver's side front outside position.
- One (1) red flashing LIN12 LED module in the driver's side front inside position.
- One (1) 794H traffic light controller in the center front position, national standard high priority.
- One (1) red flashing LIN12 LED module in the passenger's side front inside position.
- One (1) red flashing LIN12 LED module in the passenger's side front outside position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side rear corner position.

This lightbar will include the following in the lower section:

- One (1) dual white LR11 LED alley light modules in the driver's side end position.
- One (1) white flashing LIN6 LED module in the driver's side front outside corner position at a 45 degree angle.
- One (1) white flashing LIN6 LED module in the driver's side front inside angled position at a 45 degree angle.
- One (1) red flashing LIN6 LED module in the driver's side first outside position.
- One (1) red flashing LIN6 LED module in the driver's side second outside position.
- One (1) red steady burning TIR6 LED module in the center position.
- One (1) red flashing LIN6 LED module in the passenger's side second outside position.
- One (1) red flashing LIN6 LED module in the passenger's side first outside position.
- One (1) white flashing LIN6 LED module in the passenger's side front inside angled position at a 45 degree angle.
- One (1) white flashing LIN6 LED module in the passenger's side front outside corner position at a 45 degree angle.
- One (1) dual white LR11 LED alley light modules in the passenger's side end position.

There will be six (6) switches located in the cab on the switch panel to control this lightbar.

- One (1) switch located on the driver's side for all the warning lights.
- One (1) switch located on the driver's side for the traffic light controller.
- One (1) switch located on the driver's side for the driver's alley light.
- One (1) switch located on the driver's side for the passenger's alley light.
- One (1) switch located on the passenger's side for the passenger's alley light.
- One (1) switch located on the passenger's side for the driver's alley light.

The steady burning center light in the lower section will be activated with the front warning switch.

The dome colors to be red end, red, clear center, red and red end.

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

The white flashing LED's and the traffic light controller will be disabled when the parking brake is applied.

WARNING LIGHTS (CAB FACE)

Two (2) pair of Whelen Model 60RR6FRR red flashing LED lights with red lenses will be installed on the cab face, above the headlights, mounted in a common dual light housing.

There will be a switch located in the cab on the switch panel to control both sets of lights.

The flash pattern for the right side of these lights will flash separately from the left side of these lights.

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

DAYTIME RUNNING LIGHTS (HEADLIGHTS)

The low-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

There will be six (6) Whelen, Model 60*02F*R, flashing LED warning lights with chrome flanges located at the following positions:

- Two (2) Model 60RC6FCR, red LED and white LED lights with a clear lens located one (1) each side on the front cab corner.
    - The white LED portion of this light will be to the rear.
- Two (2) Model 60RR6FRR, red LED lights with red lens located to the rear of the crew cab door per print, .
- Two (2) Model 60RR6FRR, red LED lights with red lens located over the rear wheel well .

There will be a switch located in the cab on the switch panel to control the lights.

The white light will be disabled when the parking brake is set.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

SIDE WARNING LIGHTS

There will be four (4) Whelen, Model 3S*00F*R LED flashing lights provided.

The lights will be located on each door on each door.

The color of the lights will be amber.

The color of the lenses shall be the same color as the LED's.

The lights will be with a Whelen, Model 3FLANGEC surface mount chrome flange.

Each light will be activated by the door jam switch of the associated door.

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen, Model 60RR6FRR, flashing LED warning lights located at the rear of the apparatus.

The color of these lights will be red with a red lens.

There will be a switch, located in the cab on the switch panel to control these lights.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

REAR AND SIDE ZONE UPPER WARNING LIGHTS

There will be six (6) Whelen LED warning lights with Whelen, Model 6EFLANGE, chrome flanges provided.

- Two (2) Model 60RR6FRR, red lights with red lenses will be provided at the rear on the upper rear bulkhead as high and as far apart as practical.
- Two (2) Model 60RR6FRR, red lights with red lenses will be provided at the rear on the upper rear bulkhead under the above lights. The right side of these lights will flash independently of the left side of these lights.
- One (1) Model 60RR6FFR, red lights with red lenses will be provided to the side of the driver's side rear of the apparatus facing the driver's side of the apparatus.
- One (1) Model 60RR5FFR, red lights with red lenses will be provided to the side of the passenger's side rear of the apparatus facing the passenger's side of the apparatus.

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

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen, Model TAL65, 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

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

The auxiliary warning mode will be activated with the emergency master switch.

This traffic directing light will be surface mounted under a treadplate step at the rear of the apparatus in treadplate box. This box is installed as close to the outer edge of the step as practical.

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

The electronic siren will be located above the traffic directing light control head.

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

CUP HOLDER
A cup holder will be provided for the Two (2) to securely hold the push-up pole in place while in the lower position.

EQUIPMENT MOUNTING

South Coast Emergency Vehicle Service will mount fire department specified equipment in compartments upon delivery. The equipment and mounting will match the present apparatus, job number 25333. The mounting may include fabrication, purchasing of mounting equipment, and labor for installation. Fire Department will provide equipment to be mounted in a timely manner for the installation.

LOOSE EQUIPMENT
The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT,PROVIDED BY FIRE DEPARTMENT
The following loose equipment as outlined in NFPA 1901, 2009 edition, section 5.8.2 and 5.8.3 will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) playpipe with shutoff and 1.00" (25 mm), 1.125" (29 mm), and 1.25" (32 mm) tips.
- One (1) SCBA complying with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches mounted in bracket(s) fastened to the apparatus.
- Two (2) hydrant wrenches mounted in brackets fastened to the apparatus.
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).
- One (1) double female 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) double male 2.50' (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) rubber mallet, for use on suction hose connections, mounted in a bracket fastened to the apparatus.

- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 5.7.2 requires a minimum of 20 ft of suction hose or 15 ft of supply hose.

Hose is not on the apparatus as manufactured. The fire department will provide suction or supply hose.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT - BODY PAINTED TO MATCH CAB
The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom body will be thoroughly cleaned and prepared for painting. Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface will be removed or filled and then sanded smooth for a smooth appearance. All seams will be sealed before painting.

2. Chemical Cleaning and Treatment - The aluminum surfaces will be properly cleaned using a four (4)-phase, high pressure and high temperature acid etching system. All steel surfaces will be properly treated using a three (3)-phase, high temperature, cleaning/phosphatizing system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse of 25 parts per million solids or less, will be applied to final rinse all metal surfaces at the conclusion of the metal treatment process. This final rinse ensures all chemical residues are removed and that no minerals, (salts), from the water dry onto the metal surface and remain under the primers and topcoats. These salts can lead to blistering and under film corrosion.

3. Primer/Surfacer Coats - A minimum of two (2) mil dry, (.002), of two component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. The primer is a high solids and low VOC paint.

4. Hand Sanding to Ultra Fine Finish - The primer/surfacer coat is lightly sanded with mild abrasive paper to an ultra smooth finish. This hand finish process is critical to produce the smooth mirror like finish in the topcoat.

5. Sealer Primer Coat - A two (2) component sealer primer coat is applied over the sanded primer to again build toward the final smooth finish. This layer of primer sealer also gives additional corrosion protection.

6. Topcoat Paint - Two (2) coats of an automotive grade, two component acrylic urethane paint are applied to provide the lasting beauty and durability. The acrylic urethane topcoat contains a clear coat

resin chemistry that creates the high gloss and depth of image. This type of topcoat provides the best resistance against acid rain and other more common chemicals.

7. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied. Lap style doors will be clear coated to match the body. Roll-up doors will not be clear coated and the standard roll-up door warranty will apply.

A cyclic corrosion test, (General Motors test GM-9540), of 40 cycles will be required before making changes to the exterior coating process. Exterior coating systems, (excluding the undercarriage components), must achieve a 1/16 or less maximum creep from the scribe for aluminum and an 1/8 or less maximum creep from the scribe for galvanneal after 40 cycles in the General Motors GM-9540 test.

Each batch of color topcoat, together with the finish painted vehicle, is tested for precise color match. Visual color match will be checked following ASTM D-1729, (American Standard Testing Methods), procedures using CIE, (International Commission on Illumination), D75 Northern Daylight light source. Instrumental color match will follow ASMT D-2244 procedures with a maximum delta E of 1.0 for whites, 1.4 for yellows, blues, greens and 1.5 for reds.

All removable items such as brackets, compartment doors, door hinges, trim, etc. will be removed and painted separately to insure paint behind all mounted items. Body assemblies that can not be finish painted after assembly will be finish painted before assembly.

The cab and the body will be painted #107 RED. .

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous body items, an isolation tape or gasket material will be used to prevent damage to the finish painted surfaces. A nylon washer will be installed under each acorn nut or metal screw that is fastened directly to a painted body surface.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State (his) regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

Topcoats and primers will be chrome and lead free.

Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.

Particulate emission collection from sanding operations must have a 99.99 percent efficiency factor.

Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.

Water from water wash booths will be reused. Solids will be removed mechanically on a continual basis to keep the water clean.

Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.

Empty metal paint containers will be cleaned, crushed and recycled to recover the metal.

Solvents used in clean-up operations will be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation will be used as fuel in off-site cement kilns.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be painted RED #107 before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be painted are:

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

The E-coat process will meet the technical properties shown.

PAINTED AIR CONDITIONING COVER AND MOUNTS
The cover of the air conditioning condenser and the mounting feet will be painted to match the color of the cab roof.

COMPARTMENT INTERIOR PAINT
The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES
Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

The reflective vinyl band will be provided across the front bumper.

CHEVRON STRIPING, REAR
There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

The colors will be alternating ruby red and lemon yellowreflective.

Each stripe will be 6.00" in width.

This will meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND
The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

REFLECTIVE CHEVRON STRIPE ON HYDRAULIC LADDER RACK
Chevron reflective striping will be applied to the rear facing hydraulic ladder rack pivot arm to increase visibility, and to match the rear of the unit.

REFLECTIVE STRIPE, CAB DOORS
A 6.00" x 16.00" white reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

LETTERING
The lettering will be totally encapsulated between two (2) layers of clear vinyl.

LETTERING
Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, with outline and double shade will be provided.

LETTERING
There will be reflective lettering, 14.00" high, with no outline or shade provided. There will be two (2) letters provided.

LETTERING
There will be reflective lettering, 4.00" high, with no outline or shade provided. There will be 18 letters provided.

LETTERING
There will be reflective lettering, 18.00" high, with no outline or shade provided. There will be two (2) letters provided.

LETTERING
There will be reflective lettering, 5.00" high, with no outline or shade provided. There will be three (3) letters provided.

LETTERING
There will be reflective lettering, 2.00" high, with no outline or shade provided. There will be eight (8) letters provided.

LETTERING
There will be reflective lettering, 9.00" high, with no outline or shade provided. There will be six (6) letters provided.

EMBLEMS
An American flag emblem, 4.00" high x 7.00" wide, will be installed so that the top edge of the flag is inline with the top edge of the side windows of the cab . The flag will appear to be moving in the wind.

MALTESE CROSS INSTALLATION
There will be one (1) pair of maltese crosses, comprised of genuine gold leaf material, provided and installed Located on cab doors..

MANUAL, FIRE APPARATUS PARTS
One (1) custom parts manual for the complete fire apparatus will be provided in hard copy with the first of the four (4) completed units.

One (1) compact disc (CD) will also be provided with the first of the four (4) completed units that will include all of the information from the above manual.

The manual will contain the following:

- Job number

- Part numbers with full descriptions

- Table of contents

- Parts section sorted in functional groups reflecting a major system, component, or assembly

- Parts section sorted in Alphabetical order

- Instructions on how to locate parts

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

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the factory website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUAL, CHASSIS SERVICE

One (1) chassis service manual containing parts and service information on major components will be provided with the first unit of the four (4) completed units.

One (1) compact disk (CD) will also be provided with the first unit of the four (4) completed units that will include all of the information from the above manual.

The manuals will contain the following sections:

- Job number

- Table of contents

- Troubleshooting

- Front Axle/Suspension

- Brakes

- Engine

- Tires

- Wheels

- Cab

- Electrical, DC

- Air Systems

- Plumbing

- Appendix

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

MANUALS, CHASSIS OPERATION
Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP
A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY
A Detroit Diesel **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

STEERING GEAR WARRANTY
A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY
The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor Wabco™ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP
The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

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TRANSMISSION WARRANTY
The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY
The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the

warranty coverage and will not exceed $10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

WATER TANK WARRANTY
A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY
A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

PUMP WARRANTY
A Hale pump limited warranty certificate, WA0248, is included with this proposal.

TEN (10) YEAR PUMP PLUMBING WARRANTY
The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

THREE (3) YEAR MATERIAL AND WORKMANSHIP
The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

VEHICLE STABILITY CERTIFICATION
The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION
The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION
The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION
Pierce manufacturing will provide a cab crash test certification with this proposal. The certification states that the cab must meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks

- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks

- Roof Crush

The cab will be subjected to a roof crush force of 100,000 lb. This value will be 450 percent of the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of ten (10) metric tons.

- Side Impact

The cab will be subjected to dynamic preload with a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of energy. This test will closely represent the forces a cab will see in a rollover incident.

- Frontal Impact

The cab will withstand a frontal force produced from 65,200 ft-lb of energy using a swing-bob type platen.

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

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

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

The manufacturer of the apparatus will provide the following:

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

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

CONTRACT PRICING WORKSHEET

Contract No.: FS12-11 **Date:** 1/20/2015

Agency:	City of San Diego	**Contractor:**	Pierce Manufacturintg
Contact:	Jeff Mitchell	**Prepared:**	Mark Smith
Phone:	619-573-1409	**Phone:**	920-832-3294
Fax:		**Fax:**	920-832-3080
Email:	JJMitchell@sandiego.gov	**Email:**	Msmith@piercemfg.com

Prod. Code:	**WD10**	**Description:**	**One Heavy Duty Rescue**

A. Product Item Base Unit Price Per Contractor's H-GAC Contract: $ 504,850.00

B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description if applicable.

Description	Cost	Description	Cost
		ISL 400 to DD13 500 HP engine	$ 25,368.00
		LED compartment	$ 3,282.00
		Two visor lights	$ 3,344.00
		15kw generator	$ 29,101.00
		Intercom system	$ 12,504.00
		LED scene lights x 7	$ 12,775.00
		Federal Q2B	$ 3,474.00
		Subtotal From Additional Sheet(s):	$ 78,790.00
		Subtotal B:	$ 168,638.00

Total Published Options $ 673,488.00

C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.

Description	Cost	Description	Cost
		Girand awnings	$ 13,809.00
		Mast for Weather pack	$ 2,421.00
		Eye Wash station	$ 2,432.00
		L-shaped C-Tech cabinet in cab	$ 2,249.00
		Subtotal From Additional Sheet(s):	$ 4,026.00
		Subtotal C:	$ 24,937.00

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B). 4%

D. Other Cost Items Not Itemized Above (e.g. Installation, Freight, Delivery, Etc.)

Description	Cost	Description	Cost
		Sales Tax 8%	$ 55,874.00
		Tire Fee	$ 10.50
		Subtotal D:	$ 55,884.50

E. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C+D) $ 754,309.50

Quantity Ordered: 1 X **Subtotal of A + B + C + D:** 754309.5 = **Subtotal E:** $ 754,309.50

F. H-GAC Fee Calculation (From Current Fee Tables) **Subtotal F:** $ 2,000.00

Description	Cost	Description	Cost
Subtotal of column	$ -	Subtotal of Column	$ -

Subtotal G: $ -

Delivery Date: **H. Total Purchase Price (E+F+G):** $ 756,309.50

HGACBUY

Pierce Manufacturing is pleased to submit a proposal to **City of San Diego** for a **Pierce® Heavy Duty Hazardous Materials Vehicle**. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

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 all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever 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 edition 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 five (5) 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 South Coast Emergency Vehicle Service 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 fifty (50) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, 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.

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 sheet metal enclosure, valve controls, piping and operators panel) and body 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.

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.

INSPECTION TRIP(S)

The bidder will provide three (3) factory inspection trip(s) for twelve customer representative(s). The inspection trip(s) 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.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. 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.

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.

FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

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.

ANGLE OF DEPARTURE

The angle of departure will be 12 degrees. This will be effective with the truck in a loaded state.

ANGLE OF APPROACH

The angle of approach will be 13.5 degrees. This will be effective with the truck in a loaded state.

WHEELBASE

The wheelbase of the vehicle will be 256 inches.

GVW RATING

The gross vehicle weight rating will be 49,800 lbs..

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 0.38" 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 0.25". 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 in-lb.

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

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000 psi yield strength 8630 steel and the lower control arm casting will be made of 55,000 psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000 psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing shall be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

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

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

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

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

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS
KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

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 XFE wide base tread, rated for 22,800 lb 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 RS-26-185, with a capacity of 27,000 lb.

TOP SPEED OF VEHICLE
A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 65 MPH.

REAR SUSPENSION
The rear springs will be Standens semi-elliptical, 3.00" x 52.00", 12 leaves main with a ground rating of 27,000 lb. Castings will be used for spring hangers with provisions for lubrication. The grease fittings will be 90 degree type and will be accessible without removing the wheels or cutting any sheet metal. The two (2) top leaves will wrap the forward spring hanger pin and the top leaf will wrap the rear spring hanger pin on both the front and rear suspensions.

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.

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

REAR TIRES
Rear tires will be four (4) Michelin 12R22.50 radials, 16 ply "all position" XZY 3 tread, rated for 27,120 lb maximum axle load and 65 mph maximum speed.

The tires will be mounted on 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud,11.25" bolt circle. The wheels will be Alcoa© part number 893602, hub piloted.

TIRE BALANCE
All tires will be dynamically balanced with 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 six (6) 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 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.

REAR HUB COVERS
A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

LUG NUT COVERS
Stainless steel lug nut covers will be installed on all lug nuts.

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

WHEEL CHOCKS
There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS
There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model 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 one in front and one behind rear wheel driver's side.

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 4S4M, anti-lock braking system. The ABS will provide a four (4) 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.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™, Disc Plus, Model EX225, disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Bendix®, Model BA-921, with 15.80 cubic feet per minute output at 1,250 rpm.

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 4,362 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, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)

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.

- Midland Pure Air Plus air dryer, Model N4250. Air dryer will consist of the following:

- Spin-on desiccant cartridge

- Coalescing filter that is replaceable and separate from the spin-on desiccant can

- 12 volt heated moisture ejector

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.

High pressure, wire braid reinforced flexible rubber air lines will be provided from the frame to each brake chamber.

The brake lines will not be painted.

AIR INLET/OUTLET

Two (2) air inlets/outlets will be installed with the female coupling located in the driver side and passenger side lower step well of cab. This system will tie into the "wet" tank of the brake system and include a check valve in the inlet line and an 85 psi pressure protection valve in the outlet line. The air outlet will be controlled by a needle valve.

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

The air inlet will allow a shoreline air hose to be connected to the vehicle. This will allow station air to be supplied to the brake system of the vehicle to insure constant air pressure.

AIR INLET FITTING

The fitting used for the air inlet will be a Amflo CP-20 brass fitting.

ADDITIONAL AIR TANK

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 BRAKE VALVE MOUNT SPECIAL

Rear air brake valves will be mounted with AVK fasteners or weld nuts on the rear cross member for servicing.. The valves on the front of the cross member will be extended out to allow removal of the nuts from the mounting studs.

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.

CHECKVALVE AT WET TANK

A check valve will be installed between the air dryer and wet tank.

ALL WHEEL LOCK-UP

An all wheel lock-up system will be installed which applies air to the front brakes and uses the spring brake at the rear.

The front wheel lock will be an air valve on the dash panel in place of the standard rocker switch. A "Front Wheel Lock" label will be installed to the right side of the valve control knob that is visible to the driver.

This will not be an electrical version.

TELMA COTROL HANDLE &LABELING

The telma control lever will be reduced in length by 50% and a label will be added for the control lever. Increase/Decrease

TELMA CONTROL BOX LOCATION

The Telma control box will be installed in the P3 lower rear compartment corner on the tank wall several inches of the floor.

TELMA ACTIVATION (AUTO-ON)

The Telma retarder will include a five (5)-position manual control. The set position of the hand lever will determine the activation level of the Telma, when the accelerator pedal is released. The brake pedal will activate the remaining stages.

The control handle will be located to the right of the transmission shift pad.

LABEL, AIR TANKS

There will be a stick-on style label provided on all of the chassis air tanks to identify the function a particular tank provided to the chassis (i.e. quick build up, isolated, chassis air supply, etc.).

AIR TANK DRAINS

Air tank drains shall be supplied for the air tanks that are difficult to drain do to the new chassis design. The drains shall be labeled at the drain valve ball valve on both sides and be installed in and easy to read location. Match units 24023 1-8 as completed at pickup. Label the drains "Front Service Drain" "Rear Service Drain" and Air Horn Tank Drain".

AIR SYSTEM FITTING

The air line at the turbo VPOD control module will be provided with a compression fitting.

ENGINE

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

Make:	Detroit™
Model:	DD13®
Power:	450 hp at 1800 rpm
Torque:	1550 lb-ft at 1200 rpm
Governed Speed:	2080 rpm
Emissions Level:	EPA 2013
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	781 cubic inches (12.8L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor
Coolant Filter:	Cartridge style with shut off valves on the supply and return line

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® focal mounted driveline retarder will be provided on the front of the differential.

The retarder will be the electromagnetic type. Stage one and two of the retarder will be activated when the drivers foot is taken off the accelerator, and stage three and four will be activated with the application of the brake pedal.

A four (4) light, 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.

ENGINE BRAKE

A engine compression brake will be installed with the controls located on the instrument panel within easy reach of the driver.

A control switch will allow the operator to select **EITHER** the Telma Retarder or engine compression brake. An additional control switch with high, medium and low setting will be provided.

The engine compression brake will be installed in such a manner that when the engine compression 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 side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine. The ember separator will be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the inlet of the selective catalytic reduction (SCR) device, and will be 5.00" in diameter. The exhaust system will include a diesel particulate filter (DPF) and an SCR device to meet current EPA standards. 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 tail pipe will be at a 45 degree angle rearward, extend a minimum of 3.00" past the side of the body, and will discharge the exhaust horizontally. The last 7.00" of the tail pipe will be free of any restriction of hangers or clamps to ensure an easy deployment of an exhaust extraction hose. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. The diffuser will include a 5.00" diameter tip for connection to an exhaust extraction system.

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

DEFLECTOR PLATE

A deflector plate will be provided for the Aftertreatment Control Module (ACM). The deflector plate will keep water and spray from direct contact with the ACM and harness plug in this area.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of approximately 1,352 square inches. ***Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly.*** The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. 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 assembly will include an integral de-aeration tank permanently mounted to the top of the radiator framework, with a readily accessible 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

Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

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

RADIATOR SKID PLATE

A lower radiator skid plate will be supplied for protection. The skid plate shall be constructed of .25" steel plate.

PETCOCK EXTENSION

The petcock will be extended so that the petcock can be accessed and the coolant can be emptied strait down to the ground.

FUEL TANK

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

A 0.75" drain plug will be located in a low point of the tank for drainage.

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

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 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 rearward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the engine fuel inlet behind a common hinged, spring loaded, polished stainless steel door on the driver side of the vehicle.

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, at the fuel tank.

FUEL COOLER

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

The fuel filler cap will have a retaining chain and holder provided on the fuel fill door.

FUEL DOOR LABEL

The fuel fill label, "Ultra Low Sulfur Diesel Fuel Only" will be provided on the inside of the fuel fill door.

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 Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

TRANSMISSION PROGRAM
The transmission will shift to neutral when parking brake is set.

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. The slip joint will be coated with Glidecoat® or equivalent.

STEERING
Dual Sheppard, Model M110, steering gears, 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 WHEEL
The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON HORN BUTTON
The steering wheel 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: San Diego

The second row of text will be: Fire Rescue

The third row of text will be: blank

TAG/LABEL
The oil tag plate will be provided. Reference part number 15547034.

LABEL VOGEL LUBE SYSTEM
A label will be installed on the vogel lube system stating the type of grease to be used (NLGI-00) and stating "Shop Fill Only"

CHASSIS LUBRICATION DRUM PUMP KIT CREDIT
A Vogel, Model #9900-004-002, drum pump kit will not be supplied with the system.

AUTOMATIC CHASSIS LUBRICATION
An SKF MonoFlex™ lubrication system for the chassis will be provided. A electronic control unit will activate the pump after an adjustable interval time. The control unit will control and monitor the pump operation and report any faults via an indicator light on the aerial operator position.

A pump supplies the lubricant to the lubricant distributors via the main feed line. The lubricant is then metered and fed to the lubrication points. This takes place after the pump operation time, through re-lubrication distributors. During the lubrication cycle, the lubricant is pumped into the feeders' storage chambers, where it is then stored. Only after the pressure is relieved in the main line, the lubricant is dispensed under spring tension to the lubrication points (re-lubrication effect).

The reservoir will be easily accessible for service. Reservoir will be protected from damage caused by anything that may be stored in the vicinity. Power cables and main lube line will have strain relief provided.

It will consist of a transfer system, one (1) pail of grease (NLGI-00) and five (5) lubrication points.

The lubrication system reservoir will be located roof on the apparatus.

- Independent suspension control Arm Pivot Points

-Rear Axle Slack Adjusters

-Rear Axle Brake Cam Screws

- Rear Suspension Spring Pins

- Rear Suspension Shackle Pins

-Walking Beam Pins (Tandem axle, if applicable).

SKID PLATES
Steel skid plates will be provided under the cab lift cylinders to protect them from damage. The plates will be bolted on to facilitate easy removal and replacement.

GUARD AIR HOSE WITH FIRE RESISTANT WRAP

Guards shall be provided at the drivers front corner of the cab to provide an enclosure for the air hoses goining from the junction block to the cab. The Synflex hose will be wrapped with fire resistant loom from the mnifold block to where it enters the cab.

WINCH

A Warn, multi-mount, 9,000 lb portable 12V electric winch will be provided.

The winch will mount to the vehicle receiver hitch and be held in place with a locking hardened pin.

The winch will be provided with 125 feet of .313" galvanized cable with a replaceable clevis hook.

A minimum of a 30' remote control will be provided.

A label will be placed on or near the receiver that states the maximum winch load rating and the maximum rope load rating that the receiver can support.

BUMPER

A one (1) piece, stainless steel bumper, minimum of 10.00" high, will be attached to the front of the frame.

A 9.00" channel will be mounted directly behind the bumper for additional strength.

The bumper will be extended 10.00" from front face of cab.

GRAVEL PAN

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

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) chrome tow eyes will be mounted through the front face of the bumper.

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

Tow eyes will be mounted directly to the bumper frame.

Cutouts will be provided in the front face of stainless steel bumper to allow tow eyes to extend out the front.

The tow eyes will be designed and positioned to allow up to a 9,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus.

PORTABLE WINCH RECEIVER

A portable winch receiver will be centered under the front bumper extension of the apparatus.

The winch receiver will be constructed of heavy steel tubing and reinforced to the bumper extension framework for the receiving portion. The winch receiver will be a class IV receiver. It will be extended to avoid any interference with the recessed Federal Q2B mounted in the center position.

Winch power will be provided at location.

CAB

The Arrow XT 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 20.00" raised roof, with an overall cab height of approximately 123.00". 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 floor to ceiling height inside the crew cab will be 74.00" in the center and 79.25" 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 an access door constructed in the same manner as the driver and passenger doors.

The crew cab access door will be provided on the passenger side only.

The cab will be a full tilt cab style.

A 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 0.50" aluminum. The top will be constructed of 0.19" 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.

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 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.

In the event of electrical failure, a manual hydraulic override will be provided.

Cab Lift Interlock
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 battery switch is in the on position. The cab tilt switch will be disabled if the parking brake is released or the ignition switch is turned on.

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.

SCUFFPLATE
A brushed stainless steel scuffplate will be provided on the vertical surface of the area above the floor in front of the officer. The scuff plate will be approximately 10.00" tall.

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

SIDE OF CAB MOLDING
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.

DOORS
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 door will be located on the side of the cab and will be constructed in the same manner as the forward cab doors. The crew cab door will measure a minimum of 34.88" wide x 75.75" 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.

ELECTRIC CAB DOOR LOCKS
The front driver and officer doors will have a door lock master switch. The master switches will control all cab door locks.

The rear cab doors will have the standard manual lock control.

There will be one (1) concealed switch located in an easily accessible chassis specific location that will unlock all the doors.

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 strut insert 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.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located 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 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" 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. The fender crowns will have a radius outside corner that will allow the fender crown to extend out further than the standard width crown, thus extending beyond the sidewall of the front tires and allow the crew cab doors to open fully.

INTERIOR CREW CAB DOOR HANDRAIL

A handrail will be provided on the interior crew cab door pan. The handrail will be mounted at a 45 degree angle. This is in addition to the standard crew cab door handle.

CREW CAB WINDOWS

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

One (1) additional sliding window, with screen, will be provided on the driver side of the crew cab. The window will measure 35.00" wide x 24.00" 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 door, roll-up windows

TRIM, WINDOW

The chrome locking trim in all the windows will be replaced by a solid black, rubber trim.

RAISED CAB ROOF COVERING

Horizontal surfaces, on the raised cab roof portion only, will be covered with bright aluminum treadplate. Edges and fastening screws will be properly caulked to prevent water from leaking under aluminum. Front and side warning lights will not be mounted on top of treadplate. The treadplate will extend and terminate next to the warning lights.

OVERHEAD CABINET

An overhead C-Tech cabinet will be provided. The cabinet will be L-shaped, and extend along the driver's side wall and across the front of the cab. The front cabinet will be split into two (2) equal sections with the driver's side being one single section.

The cabinet will have horizontally hinged lift up doors. Below each door section will be a recessed light on the underside of the cabinet. All aluminum cabinets will have dry erase writing surfaces, with the over-head-cabinets having a pneumatic door stay to hold the doors in the open position. There will be radius edging on all exposed corners.

The dimensions of the cabinet will be 14.00" high x 14.00" deep. The driver side will be 36.00" wide and the front section will be 74.00" wide. The front section will incorporate the raised roof slanted section into the rear of this cabinet.

CABINET, COMMAND CENTER

A two (2) drawer file cabinet will be provided under the desk top work surface. The bottom drawer will be large enough to hold a hanging file. The top drawer will be made as large as possible and still fit under the desk top.

The cabinet will be constructed of plywood covered with a white plastic laminate.

The overall dimensions will be 28.00" high x 16.00" wide x 18.00"deep.

A total of one (1) cabinet(s) will be provided.

COMMAND CHAIR

Installed in the command cab will be one (1) command chair.

Arm rests will be provided along with an adjustable back.

Lap style seat belts will be provided.

The chair will swivel and have forward and rearward adjustments. A 3.00" spacer at the base, with adjustment holes, will be provided for more flexibility with forward and rearward adjustment.

COMMAND DESK
An "L" shaped desk top work surface will be provided in the rear of the cab. The desk work surface will extend from the engine blister to the drivers side of the cab and back to the rear wall. A raised section will be added above the engine blister to the passenger's side wall for mounting equipment and as a standing work surface.

The desk top and work surface will be constructed of stainless steel with a backsplash. The backsplash will provide a mounting surface for electrical receptacles.

The dimensions of the desk top will be 89.00" wide x 24.00" deep in the forward section and 54.00" long x 18.00" deep on the side section.

The inside corners will have a smooth radius where the side connects to the front.

FLUORESCENT LIGHT
Four (4), 120 volt recessed fluorescent light(s) with two (2) 24.00" bulbs will be provided. The light(s) will be located in the ceiling and under the overhead cabinets.

SWITCH FOR INTERIOR LIGHTS
The interior lighting will be controlled by one (1) 12 volt rocker light switch, located at the command desk.

CAB INTERIOR
The left and right side dash and center console will be a flat faced design to provide easy maintenance and will be constructed out of painted aluminum.

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

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on 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 upholstery will be red.

CAB INTERIOR PAINT
A rich looking interior will be provided by painting all the metal surfaces inside the cab black, vinyl texture paint.

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 0.25" 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 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 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 each will be provided in the cab. The heaters will have a 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 19.10 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 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 (1) plenum directed to the front and one (1) 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 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.

SUN VISORS

There will be two (2) vinyl covered sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

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.

OPEN TOP STORAGE BIN

An open top bin, will be installed officer's side of dash. The bin will be 4.00" wide x 6.00" deep x 3.00" high. The bin will be constructed of .125" aluminum and will be painted to match the cab interior.

SEATING CAPACITY

The seating capacity in the cab will be five (5).

DRIVER SEAT

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt. 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 SEAT

A seat will be provided in the cab for the passenger. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will be provided with 6.00" double locking fore/aft slide adjustment. The seat back will be a high back style with 9 degree fixed recline angle and side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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 flip-up seat provided at the passenger side inboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be provided with 15.00" deep foam cushion designed with EVC (elastomeric vibration control). 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 be furnished with a three-point, shoulder type seat belt. 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 SIDE OUTBOARD SEAT

There will be one (1) forward facing foldup seat provided at the passenger side outboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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.

SEAT UPHOLSTERY

All seat upholstery will be maroon woven with black Imperial 1200 material.

EMBROIDERY, SEATS

The cab seats will be provided with custom embroidery. The Fire Department will provided a picture of the design at time of approval drawing return.

This option will be provided for the driver, officer, and five (5) seat positions in the crew cab. The SCBA seats will have the embroidery on the hinged outboard head rest of each seat, and the non SCBA seat will have it on the seat headrest.

FOOT REST ANGLE

A knurled handrail type will be provided for the officers position. The handrail will be mounted to the engine housing with a flat stanchion and a "U" shaped bracket. The handrail will extend the width of the officers seat area. The foot rest will be positioned approximately 4.00" from the forward wall.

SEAT BELTS

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

The belts will also include the Ready Reach® D-loop assembly to the shoulder belt system. The Ready Reach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 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 BELT MONITORING ON COMMAND ZONE COLOR DISPLAY

A seat belt monitoring screen will be provided on the Command Zone color display. The system will be capable of monitoring up to ten (10) seating positions in the cab with green and red seating icons illuminated as follows:

Seat OccupiedBuckledGreen Icon

Seat OccupiedUnbuckledRed Icon

Seat Not OccupiedBuckledRed Icon

Seat Not OccupiedUnbuckledNo Icon

The seat belt monitoring screen will become active on the Command Zone color display when:

The park brake is released:

And

There is any occupant seated but not buckled or any belt buckled without an occupant:

And

There are no other Do Not Move Truck conditions present. As soon as all Do Not Move Truck conditions are cleared, the seat belt monitoring screen will be activated.

The seat belt monitoring screen will be manually selected anytime the Command Zone color display is powered.

The seat belt monitoring screen will be accompanied by an audible alarm that will have a unique sound that shall be different then all other alarm sounds on the vehicle and will activate when a red seat icon condition exists and the parking brake is released. A "Seat Belt Alarm " Tag will be provided above the separate buzzer at mid dash height.

HELMET STORAGE, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 14.1.8.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, chrome LED spotlights located on the cab roof, match 28068. The spotlights will be mounted to the surface of the cab roof.

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

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver and one (1) within reach of the officer.

HAND HELD LIGHT

There will be four (4) Streamlight E-Spot FireBox Vehicle Mount Systems, Model 45865, LED hand held flashlights with an orange thermoplastic body provided.

The location will be mount under the forward facing seats.

The system will include the handlight, a charger and the vehicle mount system.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of 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 directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

CAB INTERIOR

The wrap-around style high impact ABS plastic cab dash fascia will be designed to provide unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

GAUGES

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

- Voltmeter Gauge (Volts):

    - Low volts (11.8 VDC)
        - Amber indicator on gauge assembly with alarm
    - High volts (15 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very low volts (11.3 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very high volts (16 VDC)
        - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel Level Gauge (Empty - Full in fractions):
    - Low fuel (1/8 full)
        - Amber indicator on gauge assembly with alarm
    - Very low fuel (1/32) fuel
        - Amber indicator on gauge assembly with alarm
- Engine Oil Pressure Gauge (PSI):
    - Low oil pressure to activate engine warning lights and alarms
        - Red indicator on gauge assembly with alarm
- Front Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm
        - Red indicator on gauge assembly with alarm
- Rear Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm.
        - Red indicator on gauge assembly with alarm
- Transmission Oil Temperature Gauge (Fahrenheit):
- High transmission oil temperature activates warning lights and alarm
    - Amber indicator on gauge assembly with alarm
- Engine Coolant Temperature Gauge (Fahrenheit):
    - High engine temperature activates an engine warning light and alarm
        - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. 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)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)
- The following red telltale lamps will be present:
- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

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

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp

will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up 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:

- Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
- Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.
- Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel back lighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the back lighting intensity. The third switch position increases the panel back lighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications:

- High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. 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.
- The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.
- 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 disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be 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.
- 4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.
- Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.
- Parking brake control: An air actuated push/pull park brake control valve will be provided.
- 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 four (4) switch panels in the engine tunnel console facing the driver, up to three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

A diagnostic panel will be accessible while standing on the ground and 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)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the

outside ambient temperature. The upper right section will display odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

- Officer Speedometer, A Class I digital display speedometer will be provided on the officer 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 steady tone alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Hatch Door Open
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed

- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated red whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

SPARE CIRCUIT

There will be one (1) 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 50 amps at 12 volts DC.

Power and ground will terminate passenger's side crew cab wall below desk, match 26298.

Termination will be a .38" isolated stud that is less than 1.38" in total length.

Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT
There will be seven (7) 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 isolated battery
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate two on the dash, two each side of the command desk, one on the rear of the side desk, two on the front face below the lab.
- 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.

18 GAUGE SPARE WIRE
There will be a one (1) pair of 18 gauge wires, one (1) with black insulation and one (1) with white insulation, included in a separate loom installed in the apparatus.

These wires will be routed from officer's overhead and extended to passenger's side crew cab wall below desk, match 26298.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

SPARE CIRCUIT
There will be one (1) 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 isolated battery.
- The negative wire will be connected to ground.
- Wires will be protected to 30 amps at 12 volts DC.
- Power and ground will terminate D2.
- Termination will be to a Blue Sea System DualBus, Model 2723, 5 gang, dual bus bar terminal block. The terminal block will include a cover.

Wires will be sized to 125% of the protection.

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

SPARE WIRE
There will be one (1) Belden Model 8723 060 cable installed in the apparatus.

This cable will be routed from passenger's side crew cab wall below desk, match 26298 and extended to switch panel above officer's match 26298.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

SPARE CIRCUIT

There will be one (1) 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 40 amps at 12 volts DC.

Power and ground will terminate passenger's side crew cab wall below desk, match 26298.

Termination will be with 3/8" studs and plastic covers.

Wires will be sized to 125% of the protection.

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

14 GAUGE SPARE WIRE

There will be a four (4) pair of 14 gauge wires, one (1) with black insulation and one (1) with white insulation, included in a separate loom installed in the apparatus.

These wires will be routed from behind driver's seat to reach horizonally on flat surface and extended to passenger's side crew cab wall below desk, match 26298.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

INFORMATION CENTER

An information center employing a 7.00" diagonal color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display
- Display can be changed to an available foreign language

OPERATION

The information center will be designed for easy operation for everyday use.

The page button will cycle from one screen to the next screen in a rotating fashion.

A video button will allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed will return the information center to the vehicle information screens.

A menu button will provide access to maintenance, setup and diagnostic screens.

All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- Exterior Ambient Temperature
- Time (12 or 24 hour mode)
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text.

PAGE SCREENS

The Information center will include the following screens:

- Load Manager Screen
    - A list of items to be load managed will be provided. The list will provide:
    - Description of the load
- Individual Load Shed Priority Screen
    - The lower the priority number the earlier the device will be shed should a low voltage condition occur
- Load Status Screen
    - The screen will indicate if a load has been shed (disabled) or not shed.
    - "At a Glance" color features are utilized on this screen

- Do Not Move Truck Screen
    - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:
        - Driver Side Cab Door
        - Passenger's Side Cab Door
        - Driver Side Crew Cab Door
        - Passenger's Side Crew Cab Door
        - Driver Side Body Doors
        - Passenger's Side Body Doors
        - Rear Body Door(s)
        - Ladder Rack (if applicable)
        - Deck Gun (if applicable)
        - Light Tower (if applicable)
        - Hatch Door (if applicable)
        - Stabilizers (if applicable)
        - Steps (if applicable)
- Chassis Information Screen
    - Engine RPM
    - Fuel Level
    - Battery Voltage
    - Engine Coolant Temperature
    - Engine Oil Pressure
    - "At a Glance" color features are utilized on this screen
- Active Alarms List
    - This screen will show a list of all active text messages. The list items text will match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

MENU SCREENS

The following screens will be available through the Menu button:

- System Information
    - Battery Volts
    - Pump Hours
    - Transmission Oil Temperature
    - Pump Engaged
    - Engine Coolant Level
    - Engine Oil Level
    - Oil level will only be shown when the engine is not running
    - Power Steering Level
- Display Brightness
    - Brightness
        - Increase and decrease

        - Default setting button
- Configure Video Mode
    - Set Video Contrast
    - Set Video Color
    - Set Video Tint
- Startup Screen
    - Choose the screen that will be active at vehicle power-up
- Date & Time
    - 12 or 24 hour format
        - Set time and date
- View Active Alarms
    - Shows a list of all active alarms
        - Date and time of the occurrence is shown with each alarm
    - Silence alarms
        - All alarms are silenced
- System Diagnostics
    - Module type and ID number
    - Module version
- Module diagnostics information
    - Input or output number
    - Circuit number connected to that input or output
    - Circuit name (item connected to the circuit)
    - Status of the input or output
    - Power and Constant Current module diagnostic information

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing vehicle information.

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

INTERCOM SYSTEM

There will be a five (5) position intercom system with dual radio interface capability and four (4) remote transmit buttons, two (2) each for the driver and officer, located on the dash each side. Three (3) crew cab positions at three (3) forward facing seats will have radio listen / intercom only.

The following David Clark components will be supplied with this system:

- Two (2) U3816 Dual Radio Interface Modules (Driver, Officer)
- Four (4) Remote Push To Transmit Kits
- One (1) U3800 Intercom Unit. (2 adjacent Crew)
- One (1) C3820 Power Cable
- One (1) U3801 Remote Headset Station (1 Crew)
- All necessary cables and connectors

RADIO / INTERCOM INTERFACE INCLUDED

All radio interfaced stations will have universal radio interfaces installed. The interface wiring will be routed within the cab to passenger's side crewcab wall .

UNDER THE HELMET HEADSET

There will be five (5) under the helmet, headset(s) provided at seating positions.

Each David Clark, Model H3442, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress
- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction

MOBILE RADIO MODEM INSTALLATION

There will be one (1) customer supplied modem(s) sent to the apparatus manufacturers preferred installer to be installed match 26298.

Specific shipping requirements will be followed.

TWO WAY RADIO SPEAKER INSTALLATION
There will be two (2) customer supplied two way radio speakers sent to the apparatus manufacturers preferred third party installer to be installed match 26298.

Specific shipping requirements will be followed.

TWO WAY RADIO INSTALLATION
There will be two (2) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed recessed in the cab dash. No antenna mount or whip will be included in this option. Specific radio shipping requirements will be followed.

PORTABLE RADIO CHARGER INSTALLATION
There will be four (4) customer supplied portable two-way radio chargers(s) sent to the apparatus manufacturers preferred radio installer to be installed on the engine housing. Specific shipping requirements will be followed.

COMPLETE MDT INSTALLATION
There will be one (1) customer supplied Mobile Data Terminal (MDT), Docking station, Mounting bracket, power supply, antenna, GPS, modem, and all cabling sent to the apparatus manufacturers preferred installer to be installed in front of the officer. Specific shipping requirements will be followed.

RADIO ANTENNA MOUNT
There will be four (4) standard 1.125", 18 thread antenna-mounting base(s) installed upper roof on the cab roof with high efficiency, low loss, coaxial cable(s) routed to crew cab compartment located the driver's side of the desk . A weatherproof cap will be installed on each mount.

RADIO ANTENNA MOUNT
There will be four (4) standard 1.125", 18 thread antenna-mounting base(s) installed behind the light bar on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the radio box. A weatherproof cap will be installed on the mount.

KNOX-BOX®
There will be a Knox-Box KeySecure 1, Model 2611, with key pad access. It will have a blue strobe light to warn when the master key is in an unsecured position. The box will be surface mounted and installed center the cab dash to match 26298, within the cab.

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

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

COMMAND ZONE CONTROL SYSTEM

A solidstate electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

Green LED indicator light for module power

Red LED indicator light for network communication stability status

Control system self test at activation and continually throughout vehicle operation

No moving parts due to transistor logic

Software logic control for NFPA mandated safety interlocks and indicators

Integrated electrical system load management without additional components

Integrated electrical load sequencing system without additional components

Customized control software to the vehicle's configuration

Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters

Complete operating and troubleshooting manuals

USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the Command Zone control system modules will meet the following specifications:

Module circuit board will meet SAE J771 specifications

Operating temperature from -40C to +70C

Storage temperature from -40C to +70C

Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

Text description of active warning or caution alarms

Simplified warning indicators

Amber caution light with intermittent alarm

Red warning light with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with an IBM compatible computer.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

VOLTAGE MONITOR SYSTEM

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs will consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The Command Zone control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

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

electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

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

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

ELECTRICAL HARNESSING INSTALLATION

All 12-volt wiring and harnessing installed by the apparatus manufacturer will conform to specification PM-QA W-101: Pierce manufacturing Wiring Harness Specification.

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

SAE J1128 - Low tension primary cable

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

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

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

NFPA 1901 - Standard for automotive fire apparatus

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

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

Wiring will be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. 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. 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

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.

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.

BATTERY SYSTEM

Five-(5) Optima 1000M 12 volt, 800 CCA, 110 min reserve capacity, batteries with a system rating of 4000 CCA at 0 degrees Fahrenheit and 550 minutes of reserve capacity.The batteries shall be provided with SAE posts.

ISOLATED BATTERY

One (1)-12 volt, Optima 1000M battery shall be provided for voltage sensitive components. A battery isolator that is appropriately suited for the battery capacity shall 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 Guest, Model 2304A, master battery switch, to activate the battery system, will be provided to the right side of the steering column on a special bracket.

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 0.188" 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.

The compartments will include formed fit heavy duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

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.

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/ AIR COMPRESSOR

A Kussmaul Pump Plus 1200, Model 091-9-1200, single output battery charger/air compressor system will be provided. A display bar graph indicating the state of charge will be included.

The automatic charger will maintain one (1) set of batteries with a maximum output current of 40 amps.

The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

The air compressor will be plumbed to the rear reserve air tank.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

Battery charger/compressor will be located in the front left body compartment.

The battery charger indicator will be diplayed through the window behind the driver seat. The display will be mounted on a bracket so that it is visible from outside the apparatus in the front lower corner of the window.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-159-30-120, 30 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include red weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline will be connected to sub feed box with all interior outlets (rear cab and body interior).

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

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

KUSSMAUL AUTO EJECT FOR SHORELINE

Quantity of one (1) additional shorelines will be provided to operate the dedicated 120-volt circuits on the truck without the use of the generator.

The shoreline receptacle (s) will be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade 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(s) will be connected to [Connection, Shoreline].

The shoreline(s) will be located driver's side above front wheel.

Mating connector bodies will also be supplied with the loose equipment.

AUTO TRANSFER SWITCH

To protect either the generator or external power source from back feed, an automatic relay system will be installed to switch the on line device between the generator and the external power source when it is connected for use.

The transfer switch will power the sub feed box.

ELECTRIC POWER FOR WINCH

Electric power provisions will be furnished for the portable winch from the chassis battery system.

The receiver plug will be located side of the body.

A total quantity of two (2) receptacles will be provided.

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.

SPECIAL LOCATION POWER & GROUND STUDS

All of the chassis power and ground studs will be mounted to the bottom of the chassis frame for easy accessibility.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

SEALED CHASSIS HARNESS END CONNECTORS

All end connecters that are not used and exposed to the elements will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
    - If enabled:
        - "Load Man Hi-Idle On" will display on the information center.
        - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
    - ON = not shed
    - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome housings on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be five (5) Truck-Lite amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) Truck-Lite, Model 19036Y, amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) Truck-Lite, Model 10006Y kit, amber LED beehive clearance/marker lights will be installed, one (1) on each outboard side of the cab roof, above the windshield.

FRONT CAB SIDE CLEARANCE/MARKER LIGHTS

There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as clearance/marker lights with the headlight switch and directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be a three (3) LED light bar used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

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

The lights will be mounted with a Whelen, Model 6ELANGE, chrome flange.

Two (2) Whelen Model 60C00VCR, LED backup lights with 6E or 64 flange kit will be provided.

LICENSE PLATE BRACKET

There will be one (1) license plate bracket mounted on the rear of the body.

A white LED light will 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.

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.

REAR STEP BUZZER

A buzzer button compartment will be installed at the rear of the body, on the driver's side. The rear step control will be a button installed into a handle control with a ten (10) foot length of coil cord and housed in a separate compartment with a latched, stainless steel door.

MARKER LIGHTS

There will be one (1) pair of amber and red, Britax, Model L427.203.L12, LED marker lights with rubber arm, located each rear lower corner. The amber lens will face the front and the red lens will face the rear of the truck and be the most rearward marker light.

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

WARNING LIGHT FLASH PATTERN

The flash pattern of all the exterior warning lights will be set to meet the certified California, Title XIII flash pattern by either the light manufacturer's default flash pattern or by a conversion change to the certified flash pattern.

LIGHT, INTERMEDIATE
There will be one (1) pair, of Truck-Lite, Model: 30080Y flange mounted amber LED light kits will be furnished, one (1) each side of the rear fender panel, in place of the standard directional/marker intermediate light. The light will double as a turn signal and marker light.

This installation will include a stainless steel cover.

INTERMEDIATE LIGHT
There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel.

SPECIAL PROGRAMING OF LIGHTS
Battery on, ignition on or off, brake on, marker or headlights off;

No perimeter/ground/step lights on unless the corresponding door or compartment door is opened;

Then only specific lighting in the area of the open door;

The rear tailboard 45 degree lights will come on with the R1 compartment door. The PS 45 dgree light will come on with the P1 compartment door. The DS 45 degree light will come on with the D1 compartment door.

Battery on, ignition on or off, brake on, and marker or headlights on ;

All ground/step lights on;

License plate light is to be treated as a step light when appropriate conditions are met;

Pump panel lights switchable on/off with headlights on and parking brake released. A parking brake interlock will not be provided for the pump panel lights.

CAB PERIMETER SCENE LIGHTS
There will be three (3) Truck-lite, Model 44308C, 4.00" white LED lights with Model 40700 grommets provided, one (1) for each cab and 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 four (4) Truck-Lite, Model 44042C, LED lights provided on the apparatus. Each light will consist of a 4.00" weatherproof LED light, rubber mount, and pigtail kit.

The lights will be mounted in the following locations:

- Two (2) lights will be provided under the rear body adjacent to the fuel tank. The lights will be mounted at a 45 degree angle to help to illuminate the side and rear areas.
- One (1) light will be provided under the driver side forward of the rear wheel.

- One (1) light will be provided under the front corner of the passenger side of the body. This light will be mounted at a 45 degree angle to shine light towards the side as well as the passenger side running board.

The lights will be activated in the following special manner:

When the battery switch is "on", the brake is "on", and marker lights are off, then no perimeter lights will be "on" unless the compartment door is opened. All underbody lights only on the side of the body corresponding with the open door will activate. The rear compartment door will control the rear (2) perimeter lights.

There will also be one master switch in the cab for all body perimeter scene lights.

STEP LIGHTS

Two (2) white LED step lights will be provided. The step lights will be provided at the rear walk through door of body.

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 controlled by the automatic door switch, that is located on the rear walk-in door.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

SPECIAL SWITCHING FOR SCENE LIGHTS

There will be two (2) 12V white lights located rear upper scene that will be activated when the emergency master switch is on and the vehicle is shifted into reverse. Both conditions will be required for the 12V white lights to turn on.

The lights will be deactivated if the emergency master switch is off, or if the vehicle is shifted out of reverse.

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP1, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA103 located one each side of the rear body.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

a switch at the driver's side switch panel

a switch at the rear of apparatus on the driver's side

no additional switch location

no additional switch location

These light(s) may be load managed when the parking brake is set

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP2, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA203 located passenger's side high on the body.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- a switch at the rear of apparatus on the passenger's side
- no additional switch location

These light(s) may be load managed when the parking brake is set

12 VOLT LIGHTING

There will be one (1) Whelen Pioneer PFP2, 12 volt LED floodlight(s) provided on the front visor, centered.

The painted parts of this light assembly to be white.

The light will be controlled by the following:

- a switch at the driver's side switch panel.
- a switch at the passenger's side switch panel.
- no additional switch location.
- no additional switch location.

These light(s) may be load managed when the parking brake is set.

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP2, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA203 located driver's upper body.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the rear of apparatus on the driver's side
- a switch at the passenger's side switch panel
- no additional switch location

These light(s) may be load managed when the parking brake is set

DOOR SWITCHES

There will be four (4) momentary switches installed in the overhead switch panel.

- Two (2) switches, one labeled "FRONT DOOR" and the other labeled "REAR DOOR" on the driver side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.
- Two (2) switches one labeled "FRONT DOOR" and the other labeled "REAR DOOR"on the officer side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.

Two power output wires and two ground wires will be supplied to the junction box.

The output wires will be terminated in one (1) 9.45" x 6.30" x 3.54" polycarbonate junction box painted job color installed on the roof at the splice box located rear face of body.

HEAVY DUTY RESCUE BODY CONSTRUCTION

The body will be built as a separate module prior to being mounted onto the substructure. The rescue body will be constructed of 5052 aluminum.The structural support framing and the gussets used will be of 2.00" (51 mm) square, .125" (3 mm) wall 6061 aluminum alloy tubing. All exterior body corners will be 3.00" (76 mm) radius aluminum, corrosion resistant alloy 6061 extrusions. Spacing of the 2.00" (51 mm) vertical supports will not exceed 14.00" (356 mm) on center. The roof and corner extrusions will be reinforced with interconnecting gusset supports at all stress points. The body will be properly welded into a unitized construction. Proper reinforcing and supports will be utilized throughout the entire construction process to ensure strength and rigidity.

The body will be supported by 2.00" (51 mm) x 2.00" (51 mm) x 0.25" (6 mm) wall aluminum tubing. The cross sill tubes will be spaced approximately 15.00" (381 mm) on center and interconnected to the body from front to rear.

A 1.00" (25 mm) x 3.00" (76 mm) aluminum bar will be used as a stringer and will be welded to the cross sills. The stringer will be used to mount the body to the chassis frame rails.

ROOF CONSTRUCTION

The roof will be integral with the body construction. The roof will be constructed of 0.125" (3 mm) bright aluminum treadplate and supported by 2.00" (51 mm) square 0.125" (3 mm) wall tubing welded in place approximately 12.00" (305 mm) on center. The roof will be further reinforced with 2.00" (51 mm) square gussets welded approximately every 48.00" (1219 mm). The roof perimeters will be constructed of a 3.00" (76 mm) radius extrusion with an integral drip molding. The roof extrusion will also have an inset allowing the roof panel to be recessed into the extrusion giving further support and sealing effect at the outside edge.

The roof panel will be welded to the roof extrusions and supports. All roof seams will be continuously welded.

BODY AND COMPARTMENT SUPPORT

The substructure for the body will not be integral with the body but will be a separate assembly.

The bottom of each lower compartment floor will be supported by an under slung steel angle grid that will be bolted to the chassis frame rails with grade 8 bolts in order to transfer major stress to the chassis frame and not through the body. The under slung support will be constructed of 0.50" (13 mm) x 2.50" (64 mm) x 2.50" (64 mm) steel angle vertical supports. Horizontal members will be 0.38" (10 mm) x 2.00" (51 mm) x 3.00" (76 mm) and 0.38" (10 mm) x 2.50" (64 mm) x 3.50" (89 mm) steel angle.

The complete substructure will be washed, primed and finish painted before being bolted to the chassis frame. A rubber coating will be applied over the painted under slung support structure for an additional corrosion barrier.

A 3.00" (76 mm) x 0.75" (19 mm) rubber liner will be placed on top of the chassis frame rails. The liner will be used to prevent metal to metal contact where the body stringer rests on the chassis frame rails.

The compartment floors will be bolted to the under slung substructure and the body will be secured to the chassis frame by a minimum of four (4) tie-down assemblies. Each tie-down assembly will consist of two (2) 2.00" (51 mm) x 6.25" (159 mm) x 0.75" (19 mm) steel plates and two (2) 14.00" (356 mm) long, 0.50" (13 mm) diameter steel rods. The tie-downs will be easily accessible so that the body may be removed.

EXTERIOR COMPARTMENTS

The exterior compartment layout, dimensions and requirements will be minimum specifications. The compartments will be constructed of 0.125" (3 mm)-corrosion resistant aluminum alloy, including all interior panels, floor and sides. The assemblies will be held inside fixtures while being welded.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door frame. Compartment door openings will be framed by flanges, the edges in 1.75" (44 mm) and bending out again 0.75" (19 mm), to form an angle.

All compartments will be supported on top, rear and bottom. The rear wall of each exterior compartment will be welded to the cross sills.

Drip protection will be provided over all door openings with an integral roof extrusion along with a bright finished aluminum extrusion over each door opening.

WHEEL WELLS

The rear fenders will be an integral part of the body sides and compartments. The inside of the fender will be fitted with a full circular inner fender liner.

All screws and bolts, which protrude into a compartment, will have acorn nuts at the ends.

BODY LENGTH

The length of the body will be 284.00" (7,214 mm).

BODY WIDTH

The width of the body will be 96.00" (2,438 mm). The interior area will be 91.00" (2,311 mm) wide from wall to wall.

Compartment Depth

Standard Depth

All standard depth side body compartments will measure 28.00" (711 mm) deep from the outside of the body to the rear compartment wall. The usable depth inside each side body compartment will be 26.00" (660 mm) deep.

Transverse
All transverse side body compartments will have a usable depth of 26.00" (660 mm) at the floor level. These compartments will extend over the frame rails through to the other side of the body.

BODY HEIGHT

The height of the body without any roof mounted items will be 100.25" (2,546 mm) high. The height in the interior of the body will be 75.00" (1,905 mm) high.

Additional options may reduce the overall height in the interior of the body. These include, but are not limited to the items listed in the table below.

Item	Change in Interior Height
Roof Mounted A/C with Ducting	-2.00" (51 mm)
Pierce Slide-out Room	-3.00" (76 mm)

ROOF CONFIGURATION

Non-Walk-In Roof Configuration

Recessed Light Mast

A transverse recessed area will be provided for a light mast in the forward section of the roof over the non-walk-in portion of the body. The recessed area will be approximately 12.00" (305 mm) deep x 52.00" (1321 mm) wide x 88.00" (2235 mm) long. The recessed area will be constructed of 0.125" (3 mm) bright aluminum treadplate and will have two (2) 1.00" (25 mm) diameter drain holes. The drains will be routed to drain below the body.

Recessed Generator

A recessed area will be provided for a generator in the forward section of the roof over the non-walk-in portion of the body. The recessed area will be sized appropriately to fit the selected generator. The body will be provided with additional structure to support the weight of the generator. Provisions will be provided as needed to provide proper airflow for the generator. The recessed area will be constructed of 0.125" (3 mm) bright aluminum treadplate with two (2) 1.00" (25 mm) diameter drain holes provided in the recessed area. The drains will be routed to drain below the body.

Walk-In Roof Configuration

The roof over the walk-in portion of the body will be flat without any recessed items.

ROLL-UP DOOR, SIDE COMPARTMENTS

There will be ten (10) compartment doors installed on the side compartments, double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by A&A Manufacturing (Gortite).

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of the door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit (plus 82 to minus 40 degrees Celsius). Side, top and bottom seals will be provided to resist ingress of dirt and weather and will be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit (plus 148 to minus 40 degrees Celsius). Hardened plastic will not be acceptable.

A polished stainless steel lift bar with locking key latches to be provided for each roll-up door. The keys to be Model J236 for all compartment doors. The lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Door(s) will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surfaces will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartment(s), the spring roller assembly will not exceed 3.00" (76 mm) in diameter. A roll-up door that retracts below the compartment ceiling (garage door style) will not acceptable.

The header for the roll-up door assembly will not exceed 4.00" (102 mm).

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

LEFT FORWARD COMPARTMENTS

First Compartment

The first compartment will be located directly behind the cab. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.50" (1283 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Second Compartment

The second compartment will be located behind the first compartment. The compartment dimensions will be 50.88" (1292 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1292 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm)

wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Third Compartment

The third compartment will be located behind the second compartment and directly ahead of the rear wheels. The compartment dimensions will be 50.88" (1292 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1292 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

Each compartment will be capable of holding 1,100 lb (499 kg). The area over the frame rails in each compartment will be capable of holding an additional 1,000 lb (454 kg).

LEFT OVER WHEEL COMPARTMENT

Located above the rear wheels will be a compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 39.13" (994 mm) high. The compartment will be partially transverse, with the forward half of the compartment extending through to the other side of the body. The area over the frame rails will be 31.25" (794 mm) wide x 39.13" (994 mm) high. The rearward half of the compartment will be 31.25" (794 mm) wide x 39.13" (994 mm) high. The compartment door frame opening will be 57.00" (1448 mm) wide x 36.25" (921 mm) high. The compartment clear door opening will be 54.50" (1384 mm) wide x 31.25" (794 mm) high.

Compartment Loading

The compartment will be capable of holding 1,200 lb (545 kg). The area over the frame rails will be capable of holding an additional 1,000 lb (454 kg).

LEFT REAR SIDE COMPARTMENT

Located behind the rear wheels will be the left rear side compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 66.88" (1699 mm) high. The compartment door frame opening will be 60.00" (1524 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 57.50" (1461 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The compartment will be capable of holding 1,400 lb (635 kg).

RIGHT FORWARD COMPARTMENTS

First Compartment

The first compartment will be located directly behind the cab. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.50" (1283 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00"

(1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Second Compartment

The second compartment will be located behind the first compartment. The compartment dimensions will be 50.88" (1292 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1292 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Third Compartment

The third compartment will be located behind the second compartment and directly ahead of the rear wheels. The compartment dimensions will be 50.88" (1292 mm) wide x 66.88" (1699 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1292 mm) wide x 49.25" (1251 mm) high. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

Each compartment will be capable of holding 1,100 lb (499 kg). The area over the frame rails in each compartment will be capable of holding an additional 1,000 lb (454 kg).

RIGHT OVER WHEEL COMPARTMENT

Located above the rear wheels will be a compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 39.13" (994 mm) high. The compartment will be partially transverse, with the forward half of the compartment extending through to the other side of the body. The area over the frame rails will be 31.25" (794 mm) wide x 39.13" (994 mm) high. The rearward half of the compartment will be 31.25" (794 mm) wide x 39.13" (994 mm) high. The compartment door frame opening will be 57.00" (1448 mm) wide x 36.25" (921 mm) high. The compartment clear door opening will be 54.50" (1384 mm) wide x 31.25" (794 mm) high.

Compartment Loading

The compartment will be capable of holding 1,200 lb (545 kg). The area over the frame rails will be capable of holding an additional 1,000 lb (454 kg).

RIGHT REAR SIDE COMPARTMENT

Located behind the rear wheels will be the right rear side compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 66.88" (1699 mm) high. The compartment door frame opening will be 60.00" (1524 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 57.50" (1461 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The compartment will be capable of holding 1,400 lb (635 kg).

REAR ENTRANCE TO BODY INTERIOR

The interior area will be 91.00" (2311 mm) wide from wall to wall. The interior counter height will be 41.25" (1048 mm) high over the exterior compartmentation.

Access to the interior area will be through a single door. The rear door entrance will be 34.00" (864 mm) wide x 80.00" (2032 mm) high. The rear door will be constructed of .090"-5052 aluminum with a full box pan design for strength and appearance. The door will be mounted flush with the exterior of the body. There will be a 20.00" deep stepwell extending into the interior of the body.

A flush mounted, chrome plated paddle type door handle will be provided on the exterior of the personnel entrance door. The Interior door handle will also have flush paddle handle.

The outside handle will be located near the bottom of the door, approximately 55.00" (1397 mm) from the ground, allowing an average height person the ability to open the door while standing on the ground. The inside door handle will be located approximately half way up the door in the center.

A chrome plated grab handle will be horizontally mounted on the inside of the access door to aid in closing.

The door hinge will be full length polished stainless steel with a .25" (6 mm) stainless steel pin. The hinge will be attached to the body and door with stainless steel screws or bolts. (hinges that are welded on will not be accepted.) Isolation tape will be furnished between the hinge and the door jam.

The rear door will be furnished with a chrome plated socket and plunger hold open device to hold the door in an open position.

The door will close on the non-hinged sides with two air cell, hollow core extruded rubber seals. One (1) seal will be fastened to the door lap and another larger seal fastened to the door opening flange. The bottom seal will be below the flush sweep out walkway. A closed cell rubber seal will be on the hinge side to provide a complete water tight walk-in rescue unit.

The door will have a sliding window 15.00" (381 mm) wide x 18.00" (457 mm) high with a sliding screen located at the top of the door. A second, non-sliding, 15.00" (381 mm) wide x 18.00" (457 mm) high window will be installed at the lower portion of the door.

Both windows will have tinted automotive safety glass.

INTERIOR CONSTRUCTION

Ceiling and Side Wall Construction

The ceiling and side walls (above countertop) will be insulated with a 0.25" (3 mm) double sided foil insulation and a 1.50" (38 mm) acoustical foam insulation. The side walls will then be covered with a brushed stainless steel overlay. The ceiling will be covered with a .25" plywood and gray Nevamar plastic laminate overlay.

All angles and corners will be properly trimmed to provide a smooth, pleasing appearance. All joints will be covered with extrusions.

The material on the ceiling and side walls will be secured with collared screws making them removable.

Countertop Construction

The interior horizontal surfaces (countertop) over the exterior compartments will be covered with 0.75" (19 mm) thick plywood and a brushed stainless steel overlay.

The countertop will be free of any bolts or screws in order to provide a smooth surface.

Interior Walkway and Floor Construction

The interior walkway sides (below countertop) will be lined with brushed stainless steel. The side walls of the walkway will extend up over the countertop creating a 1.00" (25 mm) lip at the edge of the countertop to prevent objects from sliding off the surface.

The interior floor will be constructed by welding a sheet to the cross sills of the substructure. There will be a .63" exterior grade plywood sub-floor mounted directly to the welded sheet. Fastened to the .63" sub-floor will be a .25" plywood overlay creating a finished subfloor for adhering the final floor material.

The final floor material will be **Lonseal Loncoin II Flecks** Gray Flecks non-slip vinyl installed on top of the plywood sub floor. The flooring will be rolled up the side walls 4.00" providing a vertical kick plate.

The floor will be installed so that a total seal is provided that will allow a complete wash down without any moisture penetrating the plywood sub floor.

ROOF HATCH COMPARTMENT

The roof of the apparatus will be modified to incorporate hatch compartment(s). The compartment will be constructed of aluminum tread plate and be an integral part of the roof assembly.

All compartment doors will hinge on the outboard side and be held open with gas cylinder struts. A chrome plated lift handle will be provided on each hatch door.

A 1.00" (25 mm) diameter drain will be provided in each compartment floor and will be routed to drain below the body.

The doors will activate the Do Not Move Truck Light when the battery switch is on and a door is open.

There will be a On Scene Solutions Model 73054, 54.00" (1,372 mm) long LED light strip mounted to the underside of each hatch door. The light will be activated when the battery switch is on and the doors are open.

The compartment(s) will be as large as possible and one each side hinged to the outside .

There will be two (2) provided.

LED INTERIOR CEILING LIGHTS
There will be four (4) Rom Model Durolumen R03851 white LED, 12 volt lights recessed in the ceiling of the body interior.

The lights will be equally distributed throughout the body interior providing light to the center walkway.

SWITCH FOR CEILING LIGHTS
The primary ceiling lights will be actuated by one (1) 12 volt rocker switch located near the area entrance.

ROOF VENT
There will be one (1) Fan-Tastic, Model 4000 R, three (3) speed, 12 volt roof fan(s) with intake / off / exhaust switch, removable screen, and lifetime guaranteed polycarbonate dome installed over lab area.

The vent will fit a standard 14" x 14" opening.

The performance of the vent will be as follows:

- High speed920 SCFM, 3 amps

- Medium speed653 SCFM, 2.29 amps

- Low speed478 SCFM, 1.86 amps

HEATING AND AIR CONDITIONING
There will be one (1) ,arctic white Coleman, 120 volt Mach 8 low profile air conditioning unit(s) installed on the body roof rear area . Each air conditioner will have cooling capacity of 15,000 BTU, heating capacity of 6000 BTU, and include a condensate pump and hose to prevent accumulation of condensate on the roof.

Control will be via A wall mounted digital thermostat capable of controlling the rooftop air conditioner with electric heat element .

Each unit will have an overall height of 8.25" and weigh 92 lbs.

OVERHEAD CABINET
The body interior will be furnished with an overhead cabinet. The cabinet will be constructed of powder coated light gray aluminum with anodized aluminum frames. The cabinet will be 17.00" high x 14.00" deep, with a maximum width of 84.00".

The cabinet will be provided with lift-up doors constructed of double pan construction with a powder coated gray finish. Each door will not exceed 30.00" in length and will have a clear door height of 12.75" high. Each door will be mounted on a full-length aluminum hinge. A full-length aluminum extruded rail will be provided at the bottom edge of each door. The rail will act as the latching mechanism as well as the handle for each door. Door stays will be provided on each door to hold the doors in an open position.

When space permits the overhead cabinet will be provided with a radius edge. The edging will provide a uniform finished interior appearance.

When radius edging is provided on the bottom of the cabinet, the cabinet will include under cabinet lighting. The lighting will consist of one (1) puck style light under each door opening. The light will be controlled by a switch mounted on an adjacent wall unless otherwise specified. When more than one (1) cabinet is mounted in the same location the cabinet lights will be controlled from a common switch.

A total quantity of one (1) overhead cabinet(s) will be provided driver's side.

WALL CABINET

The body interior will be furnished with wall cabinet(s). The cabinet(s) will be constructed of powder coated light gray aluminum with anodized aluminum frames. The cabinet(s) will be 29.00" high x 24.00" deep, with a maximum width of 48.00".

Each cabinet door will be made of double pan construction. The door(s) will be mounted on a full-length vertical aluminum hinge. A full-length aluminum extruded rail will be provided at the edge of each door. This rail will act as the latching mechanism as well as the handle for each door. Each door will not exceed 24.00" in width.

When space permits the cabinet(s) will be provided with a radius edge. The edging will provide a uniform finished interior appearance.

A total quantity of two (2) will be provided passenger's side.

WORK AREA FOR A HAZ-MAT LAB

A portion of the interior will be sectioned off to serve as a lab area for hazardous material analysis. The lab area will be up to 48.00" wide x the full height of the interior and will be provided with a full width counter top that is approximately 24.00" deep.

The counter top work surface will be covered with brushed stainless steel. The work surface will be provided with a 6.00" back splash on the back and sides and a 2.00" flange on the front to contain any potential spills. The front flange will be formed in a manner to provide a mounting area for a six (6) place terminal strip. A drawer that is 24.00" wide x 3.00" high x full depth of the work surface will be provided under the counter top. The drawer will be installed on slides with a positive latch provided to keep the drawer closed.

A stainless steel fabricated exhaust hood and fan vented to the exterior of the body will be provided above the lab countertop. The fan will be a Flow Sciences model FS4510 dual fan and filter housing designed into the exhaust hood with a FS4060 HEPA filter and FS4251 organic solvent filter bed. The fan motor will include a remotely mounted variable speed control, KB Electronics model KWBC-16 with threaded stem and jam nut. Controls will be mounted on a small control panel on the rear wall of the lab area. The exhaust hood will also contain a model FS1645 face velocity alarm. The filters will be easily accessible and removable for easy replacement.

Connected to the exhaust hood will be an acrylic splash shield. The splash shield will be the full width of the exhaust hood and work top surface. The top half of the splash shield will be fix mounted. The bottom half of the splash shield will slide up to allow work to be performed within the contained area. The bottom half will raise and latch in 4.00" increments. The entire hazardous material work area will be completely contained and sealed when the front acrylic shield is closed.

Four (4) 12 volt 4.00" round recessed lights will be provided in the ceiling, above the lab work surface area. The lights will be activated by the door switch and a switch located inside the lab area.

The lab area will be located front of the room

SINK, FAUCET AND EYE WASH STATION

There will be a sink and eye wash station provided in the interior of the body.

Sink

A small stainless steel sink will be recessed into the counter top and plumbed to supply and waste tanks. A metering faucet will be installed at the sink. All appropriate hoses that run from the tanks to the sink will be provided.

Eyewash Station

An eyewash station with drench hose will be provided and plumbed to supply and waste tanks. The eyewash station will be an Encon brand, counter mounted, handheld dual stream drench hose with built in eyewash. The eyewash will have an 8' rubber hose, an aluminum handle with squeeze valve and dual acetal heads with hinged covers.

Pump

A 12V self-priming flow controlled water pump will be provided and plumbed to the water system. The pump will be wired to activate when there is demand from the water system. The pump will be located in the best area for functionality and accessibility as determined by Pierce.

Water Tanks

There will be one (1) 50 gallon tank supplied for holding fresh water and one (1) 60 gallon tanksupplied for holding gray water. The fresh water tank will include a sight gauge to allow a person to view it from the outside of the body when filling with water

A male garden hose style connection with a shutoff valve will be provided for filling the fresh water tank.

The fill drains and the wastewater drain will be clearly labeled.

The water tanks will be located in the best area for functionality and accessibility as determined by Pierce.

CABINET SHELVING

Interior cabinet shelving will be provided.

Construction will consist of .188" thick aluminum formed to provide a 2.00" high wall around the perimeter.

Corners will be welded to provide a rigid unit.

Shelving will be secured within the cabinet by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

Shelving and mounting tracks will be painted to match the interior cabinets.

There will be two (2) provided one each side inside overhead Ctech cabinets.

COMPUTER NETWORK

The computer network will consist of one (1) Leviton, Model 69586-R24, rack mounted, 1RU 24-port recessed flat panel patch panel. Category 6 UTP cabling, which provides performance of up to 250 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), 1000BASE-T/1000BASE-TX (Gigabit Ethernet) and 10GBASE-T (10-Gigabit Ethernet), will be routed to workstations, printer / plotters, and I/O box.

There will be a total of five (5) , RJ45 ports provided one in the wall of the lab, one above the driver's side command desk at the rear, one each side above the forward facing command desk and one below the desk on the passenger's side . The following port colors will be used orange, .

There will be one (1) Cat6 cable patch cord provided for each device port and an equal number for patch panel connections.

USB 2.0 WALL PLATE EXTENDER

There will be one (1) TruLink® Universal Serial Buss (USB) type A female wall plate to USB type B female wall plate kit provided from rear lab hood to command cab area . The kit will allow for USB 2.0 with transfer rates up to 480Mbps to be extended beyond the 16.40' (5m) cable limitation, up to 328' (100m).

NETWORK PRINTER

There will be one (1) color inkjet printer, fax, scanner, copier with computer network interface located at the command desk with exact location determined at construction visit.

COMPUTER NETWORK SWITCH

There will be one (1) Allied Telesis, Model AT-FS708, eight (8) port unmanaged 10/100Mbs computer network switch with internal power supply provided. Auto-negotiating 10/100 ports will automatically detect speed and duplex modes of attached devices, enabling the switch to automatically configure for the best possible performance while non-blocking filtering and forwarding of traffic, provides even more performance. Each port will have Auto MDI/ MDI-X.

WIRELESS ROUTER

There will be a total of one (1) D-Link brand model DIR-825 wireless router(s) supplied and installed [Location].

The router(s) will use dual band technology that supports 2.4GHz & 5GHz wireless signals at the same time.and be backward compatible with 802.11g and 802.11a devices. The router will use intelligent QoS technology to prioritize internet traffic as well as wired and wireless network traffic and support Good Neighbor Policy to prevent interference with other wireless networks.

Features of the router will include:

- Four (4) Gigabit LAN Ports

- One (1) Gigabit WAN Port

- One (1) USB Port

- WPA™ or WPA2™ encryption

- Network Address Translation (NAT)

- Stateful Packet Inspection (SPI)

- VPN Pass-through / Multi-sessions PPTP / L2TP / IPSec

ELECTRIC AWNING

An electrically opening and closing awning with 120 volt electric motor will be supplied. The awning will be stored in a metal enclosure on the side of the body with end fairings for blending into the side of the body when not in use. The awning enclosure will be painted 107 .

A switch will be provided for easy push button convenience inside an adjacent forward compartment. A manual crank will be provided in the event of a power failure. A sensor will be provided to retract the awning automatically in high wind conditions.

The awning will span the full length of the body or a maximum of 22' 11.00". The awning will extend out 8' from the body. When fully extended, the awning will be self supported without the use of poles extending to the ground.

The awning will activate the Do Not Move Truck indicator circuit to alert the cab occupant(s) that the awning is not in the stowed position when the parking brake is released.

The awning will be red.

A total of two (2) will be supplied.

The awning will be installed both sides.

ENCLOSURE AROUND AIR CONDITIONER UNIT

An aluminum treadplate enclosure will be provided on the roof to protect the air conditioner unit from damage.

The enclosure will be a three (3) sided design with the top and the front side open. In order to provide proper airflow to the unit, depending on space restrictions either knockouts will be provided in the walls of the enclosure or the walls of the enclosure will be spaced away from the unit. The enclosure will be removable in order to provide adequate access for maintenance on the unit.

There will be a total of one (1) enclosure(s) provided for the air conditioner unit(s) located rear.

SIDE HITCH RECEIVERS

There will be one (1) hitch receiver installed through the body fender panel in front of the rear wheels on each side of the body. The hitch receivers will be constructed of heavy steel tubing and reinforced to the apparatus framework. The side hitch receivers will each be capable of retaining a portable winch with a rating of no more than 9,500 lb.

There will be stainless steel doors provide on the exterior of the body covering the ends of receivers in the fender area. The spring loaded hinged doors will have a flush latch provided to prevent them from opening while not in use. A stainless steel trim ring will be provided to prevent damage to the exterior finish around the opening.

Access to the side receiver pins will be provided through the compartment ahead of the receiver and through the fender liner. The liner access will have a small hinged door provided to prevent debris from entering the area of the retaining pin. The access inside the forward compartment will be provided with a rubber cover to prevent road dust from entering the compartment.

LADDER ZICO MODEL RL-2-6

A Zico model RL-2-6 Quic-Ladder will be provided at the rear of the body on the right side side. The ladder handrails will be constructed out of 1.25" heavy-walled aluminum tubing that is covered by black non slip coating. Each step will have a flat non-skid surface that is 3" deep x 15.5" wide. A swing-out and down extension section at the bottom of the ladder will be providedThe swing-out step will activate the "Do Not Move Truck" light in the cab when in the lowered position.

WEATHER STATION

There will be a side mounted telescoping pole with quick release weather sensor adapter located on the apparatus body on the driver's side of the rear entry door . The quick release adapter will activate the "Do not move" indicator in the cab with the sensor installed. The top of the pole will be at roof height when nested.

The following Coastal Environmental components will be provided:

- One (1) MTR-MAST-SIDE Side-mount telescoping mast with KamLock installed
- One (1) MTR-UP LIGHT Weatherpak VM "up" indicator circuit

TRIM BODY SEAMS

All body seams will be trimmed with the same material as the body construction and painted to match the body paint.

ADJUSTABLE HATCH COMPARTMENT DIVIDER
An adjustable hatch divider made of .12" aluminum will be provided. The divider will be fastened to aluminum tracks on both sides of the hatch interior to allow front to back adjustment.

A total of four (4) will be provided two in each hatch.

STORAGE RACK FOR SPARE SCBA BOTTLES
A storage rack will be provided P1 to hold 14 spare SCBA bottles. The rack will be built to hold the bottles 2 x 7.

The rack will be constructed of 0.12" aluminum. The inside of the rack will be left unpainted and the outside of the rack will be painted the same color as the compartment it is installed in. Each storage slot will angle to the rear of the rack in order to minimize the chances of the bottle falling out. A rubber bumper will be provided on the rear wall of each slot to absorb the shock of the bottle being placed into position. Scuff tape material will be applied to the inside of the each slot to reduce scratching on the bottle.

The inside dimension of each bottle slot will be 7.50" x 7.50".

RECESS FOR REEL
The compartment top and hatch compartment bottom will be modified to allow two (2) reel(s) to be recessed. A removable aluminum treadplate shelf will be installed on the reel bracket providing additional storage above the reel that is accessible from the hatch compartment opening.

Reels to be recessed above compartments D2 & P2.

ADJUSTABLE SHELF, SPECIAL SIZE
An adjustable shelf with a capacity of 500 lb (227 kg) will be provided. The shelf construction will consist of 0.188" (5 mm) aluminum with 2.00" (51 mm) high sides along the entire perimeter of the shelf. The shelf will be finished to match the compartment interior.

The shelf will be a special size as specified by the customer with a maximum depth of no more than 24.00" (610 mm) deep.

The dimensions of the shelf will be full width and depth.

The shelf will be infinitely adjustable by means of threaded fasteners that slide in an aluminum track.

A total of two (2) will be provided..

The shelf(ves) will be located one in P2, two in D1.

TOOLBOARD, TRANSVERSE
An aluminum toolboard will be provided and mounted in a slide-out tray in a transverse compartment (tray not included). The tool board will be a minimum of 0.18" thick with 0.20" diameter holes in a pegboard pattern, on 1.00" centers. A 1.00" x 1.00" aluminum square tube frame will be welded around the perimeter of the board for additional strength.

The toolboard will span the full depth of the transverse compartment and will be designed to be as tall as possible to fit in the specified mounting location.

The toolboard will be mounted on aluminum tracks to allow for side to side adjustment within the tray.

The total capacity rating of the toolboard will vary depending on the tray it is mounted in (capacity rating for this toolboard will match the capacity rating of the tray it is mounted in).

A total of two (2) toolboard(s) will be provided for the slide-out tray(s) located D3/P3.

SLIDE-OUT/TILT-DOWN TRAY, STANDARD DEPTH

A slide-out, tilt-down tray will be provided. The bottom of the tray will constructed of 0.188" (5 mm) thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends, and tracks. The corners will be welded to form a rigid unit.

The interior of the tray will be 3.00" (76 mm) high and as deep as possible for a standard depth compartment. The tray will be built to fit the width of the area where the tray is installed.

A spring loaded lock will be provided on each side at the front of the tray. Activating the locks will allow the tray to slide out approximately two-thirds of its length from the stowed position and tip 30 degrees down from horizontal. The tray will be equipped with ball bearing rollers for smooth operation.

Rubber padded stops will be provided for the tray in both the stowed and extended positions.

The capacity rating of the tray will be a minimum of 200 lb (91 kg) in the extended position.

The vertical position of the tray within the compartment will be adjustable.

There will be two (2) tray(s) provided D1, P1.

SLIDE-OUT/TILT-DOWN TRAY, 1/2 TRANSVERSE

A slide-out, tilt-down tray will be provided. The bottom of the tray will constructed of 0.188" (5 mm) thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends, and tracks. The corners will be welded to form a rigid unit.

The interior of the tray will be 3.00" (76 mm) high and approximately half the depth of a transverse compartment. The tray will be built to fit the width of the area where the tray is installed.

A spring loaded lock will be provided on each side at the front of the tray. Activating the locks will allow the tray to slide out approximately two-thirds of its length from the stowed position and tip 30 degrees down from horizontal. The tray will be equipped with ball bearing rollers for smooth operation.

Rubber padded stops will be provided for the tray in both the stowed and extended positions.

The capacity rating of the tray will be a minimum of 200 lb (91 kg) in the extended position.

The vertical position of the tray within the compartment will be adjustable.

There will be six (6) tray(s) provided D5, P5, D4, P4, D2, P2.

REAR BUMPER
A rear bumper will be provided that is a an integral part of the rear body substructure.

The bumper will be 8.00" deep x 90.00" wide

The bumper will have an aluminum treadplate deck with a 3.00" radius on each of the two (2) outside corners.

REAR WALL, BODY MATERIAL
The rear wall will be smooth and the same material as the body.

TOW EYES
Two (2) rear chrome plated tow eyes will be located at the rear of the apparatus and will be mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes will be radiused.

DOOR GUARD
ten (10) compartment doors will include an L-shaped guard designed to protect the bottom and interior side of the roll-up door from damage when in the retracted position and contain any water spray while the door is being opened. The guard will be fabricated from stainless steel and installed all compartments.

ELECTRIC DOOR LOCK MASTER CONTROL
The electric body door locks will be locked or unlocked through the cab controls.

In the event of loss of power, a manual override is available.

ELECTRIC DOOR LOCKS
There will be ten (10) door(s) located all side compartments equipped with electric locks. The locks will be wired battery direct. The switch for control will be located on the cab dash. In the event of loss of power, a manual override is available.

ROLL-UP DOOR TRIM
The exterior of the aluminum trim around the door opening will be painted job color.

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

COMPARTMENT LIGHTING
There will be ten (10) compartments with On Scene Solutions LED compartment light strips. The strips will be centered vertically along each side of the door framing. The compartments with these strip lights will be located all compartments.

Any remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

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

COMPARTMENT LIGHTING, ADDITIONAL

There will be two (2) On Scene Solutions, Model Night Stik LED light(s) provided in the compartment(s) located one in each upper hatch compartment on upper door edge when door is in the open position. Each light will be 54.00" in length.

Opening the compartment door(s) will automatically turn the compartment lighting on.

ADJUSTABLE SHELVES

There will be one (1) shelf with a capacity of 500 lb provided. The shelf construction will consist of .188" steel 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 location will be P1 under the air bottle compartments.

FULL TRANSVERSE ADJUSTABLE SHELF

An adjustable shelf will be provided for use in a transverse side body compartment. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides.

The shelf will span the full depth of the transverse compartment and will be as wide as possible for the specified mounting location.

The shelf will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

The shelf will have a load capacity of 500 lb.

A total of [Qty, Shelf] will be provided [Location, Shelf].

TRANSVERSE TWO (2) WAY SLIDE-OUT UTILITY TRAY

There will be four (4) slide-out trays provided for use in the transverse side body compartment(s).

Each tray will be a utility style tray that is rated for up to 500 lb in the extended position. The bottom of each tray will be constructed of 0.19" thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends and tracks. The corners will be welded.

Each tray will have 3.00" high sides, will span the full depth of the transverse compartment and will be as wide as possible for the designated mounting location.

Each tray will be supported with a minimum of six (6) ball bearing rollers. Each tray will slide out two thirds (2/3) of its length to either side of the apparatus.

Automatic locks will be provided for both the in and out positions. The trip mechanism for the locks will be located at the front of each tray for ease of use with a gloved hand.

The vertical location of each tray within the compartment will be adjustable.

The tray(s) will be located two in D4/P4, and two in D5/P5.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray(s) with 2.00" sides provided P1. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" aluminum with welded corners. The finish will be painted to match compartment interior.

Slides will be equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

TWO (2) WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY

There will be two (2) floor mounted utility slide-out tray(s) provided in compartments D3/P3. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" thick aluminum for the tray bottom and special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be painted to match compartment interior.

The tray will be 3.00" high x full depth of the transverse compartment x as wide as possible for the compartment.

The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length to either side of the apparatus.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

STANDARD DEPTH SLIDE-OUT FLOOR MOUNTED TRAY

There will be two (2) floor mounted slide-out tray(s) with 2.00" sides provided D4 and P4. Each tray will be rated for up to 500 lb in the extended position. The tray(s) will be constructed of 0.19" aluminum with welded corners. The finish will be painted to match compartment interior.

Each tray will be mounted on two (2) under mount, roller bearing type slides. Each slide will be rated at 250 lb with a factor of safety of two (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 slide will require no more than a 50 lb 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 the locks will be located at the front of the tray for ease of use with a gloved hand.

DRAWER ASSEMBLY

A slideout drawer assembly will be installed D3.

The clear dimensions of the first drawer starting at the top will be 3.25" with a face plate that is 4.00" high x 21.00" deep. The clear dimensions of the second drawer will be 3.75" with a face plate that is 4.00" high x 21.00" deep. The clear dimensions of the third drawer will be 4.75" with a face plate that is 5.00" high x 21.00" deep. Each drawer will be the same width and not exceed 48.00".

The drawers will have a capacity of 250 pounds.

The drawers will be mounted in a cabinet housing constructed of light gray powder coated aluminum with anodized aluminum frames. The housing will be 24.00" deep, and completely enclose the drawer.

A full-length aluminum extruded rail will be provided at the top edge of each drawer. This rail will act as the latching mechanism as well as the handle for each drawer.

There will be a total of one (1) provided.

VERTICAL DIVIDER

A .12" thick aluminum vertical compartment divider will be provided D2, P2. The divider will be secured in place with #10 self tapping screws.

A total of two (2) will be provided.

MATTING, COMPARTMENT TRAYS AND SHELVES

Dri-Deck rubber compartment matting will be provided in 19 compartments on the compartment trays and shelves.The locations are, all trays and shelves.

The Dri-Deck will be red, and .562" thick with holes in the decking to allow air to flow.

MATTING, COMPARTMENT FLOOR

Dri-Deck rubber compartment matting will be provided in two (2) compartments on the compartment floor. The locations are, hatch compartments.

The Dri-Deck will be red and .562" thick with holes in the decking to allow air to flow.

MATTING, COMPARTMENT FLOOR

Dri-Deck rubber compartment matting will be provided in four (4) compartments on the compartment floor. The locations are, D1, D5, P5,P3.

The Dri-Deck will be red and .562" thick with holes in the decking to allow air to flow. The leading edge of the matting will include the beveled edge.

FLOOR EXTENSION
There will be a compartment floor extension provided. The floor extension will extend from the area over the frame rails to within an inch of the compartment door. The floor extension will have a 2.00" vertical lip and a 1.00" return flange.

A total of two (2) will be provided and located one in each compartment D3 & P3.

RUB RAIL
The bottom edge of the side compartments will be trimmed with a bright stainless steel rub rail. The rub rail will be 2.00" high and extend 1.00" away from the body, with slanted ends to provide a pleasing appearance.

These 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 installed between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

STORAGE COMPARTMENT
A total of one (1) fender panel storage compartment(s) will be provided. on the passenger's side rear of wheel. Each compartment will be a triangular shaped compartment that maximizes the available storage space in the corner of the fender panel.

The floor of the compartment will be lined with rubber and will be furnished with a drain hole.

A stainless steel door with a chrome plated latch will be provided to contain the equipment. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

SWING DOWN STEP
A swing down style rear access step will be installed onto the rear tailboard. The step will swing up and stow above the tailboard in the "up" position and swing down for use as a stepping surface in the "down" position.

A chrome plated lift handle will be provided on the underside of the step to aid in raising and lowering the step.

The step will be provided with gas assist cylinders to secure the step in the up and down positions.

The step will be approximately 39.00" wide x 8.00" deep. The step will be fabricated from polished aluminum treadplate with a Morton Cass insert to provide a non-skid stepping surface.

When the step is in the "down" position, a text message will be displayed on the Vehicle Information Center multiplex display screen that reads "Rear Step Not Stowed".

When deployed, the step will meet the NFPA requirement for minimum stepping height from the ground.

GARDEN HOSE OUTLET

An outlet terminating with a with a male .75" garden hose thread adapter and a quarter-turn valve will be provided. The discharge will be plumbed to an on-board water tank (not included with this option) and a 12 volt pump (not included with this option).

A total of one (1) outlet(s) will be provided rear of the body.

AIR HORN SYSTEM

There will be two (2) Grover, air horns provided and located in the front bumper, recessed to the outside of the frames. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

AIR HORN CONTROL

The air horns 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 air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

AIR HORN SWITCHING

The air horns will be the default from the horn ring when the battery switch is turned on. The electric chassis horns will be secondary.

ELECTRONIC SIREN

A Unitrol, model UTM-1, electronic siren and PA system will be provided. A Unitrol, model UNCT, noise-canceling microphone will be provided with the siren amplifier.

The siren will have the following features:

- Switch types: rocker and toggle.

- Panel lighting: adjustable when dashboard lights are dimmed.

- Horn Ring control: Built-in, automatic polarity compensation.

- Short-circuit protection.

- Internal programming switches: Field-adjustable internal switches permit selection of siren sounds and functions to suit personal preferences or local laws.

- Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound after five (5) seconds.

- Kill: stops siren sound when parking brake is set.

- Lock: - Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound on demand when horn ring or manual switch is pressed again.

- Sweep: Siren continuously changes three (3) sounds every six (6) seconds. The sequence is started and stopped on demand by pressing the horn ring or manual switch once.

NFPA 1901, Section 13.9.1.1 requires the siren manufacturer to certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens*.

Per the fire department specification, the siren and siren speaker come from separate manufacturers and a certification is therefore invalid. The apparatus will be non compliant to NFPA 1901 standards at time of contract execution.

Siren head will be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket will be capable of rotating a minimum of 180 degrees.

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.

SPEAKER

There will be two (2) speakers provided. The speakers will mount to the outside of the frame rails. Each speaker will be a Cast Products, model SA2403, 100 watt, inside-the-bumper mount, with trim bezel. Each speaker will be connected to the siren amplifier.

There will be one (1) speaker recessed in the passenger's side and one (1) speaker recessed in the driver's side of the front bumper.

AUXILIARY MECHANICAL SIREN

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

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

A second siren brake switch will be installed on the passenger side.

WARNING LIGHTS

There will be one (1) 72.00" Whelen Delta Model DISF72-A, lightbar mounted on the cab roof.

This lightbar will include the following in the upper section:

- One (1) red flashing LED module in the driver's side rear corner position
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) red flashing LIN12 LED module in the driver's side front outside position.
- One (1) red flashing LIN12 LED module in the driver's side front inside position.
- One (1) 794H traffic light controller in the center front position, national standard high priority.
- One (1) red flashing LIN12 LED module in the passenger's side front inside position.
- One (1) red flashing LIN12 LED module in the passenger's side front outside position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side rear corner position.

This lightbar will include the following in the lower section:

- One (1) dual white LR11 LED alley light modules in the driver's side end position.
- One (1) white flashing LIN6 LED module in the driver's side front outside corner position at a 45 degree angle.
- One (1) white flashing LIN6 LED module in the driver's side front inside angled position at a 45 degree angle.
- One (1) red flashing LIN6 LED module in the driver's side first outside position.
- One (1) red flashing LIN6 LED module in the driver's side second outside position.
- One (1) red steady burning TIR6 LED module in the center position.
- One (1) red flashing LIN6 LED module in the passenger's side second outside position.
- One (1) red flashing LIN6 LED module in the passenger's side first outside position.
- One (1) white flashing LIN6 LED module in the passenger's side front inside angled position at a 45 degree angle.
- One (1) white flashing LIN6 LED module in the passenger's side front outside corner position at a 45 degree angle.
- One (1) dual white LR11 LED alley light modules in the passenger's side end position.

There will be six (6) switches located in the cab on the switch panel to control this lightbar.

- One (1) switch located on the driver's side for all the warning lights.
- One (1) switch located on the driver's side for the traffic light controller.
- One (1) switch located on the driver's side for the driver's alley light.
- One (1) switch located on the driver's side for the passenger's alley light.
- One (1) switch located on the passenger's side for the passenger's alley light.
- One (1) switch located on the passenger's side for the driver's alley light.

The steady burning center light in the lower section will be activated with the front warning switch.

The dome colors to be red end, red, clear center, red and red end.

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

The white flashing LED's and the traffic light controller will be disabled when the parking brake is applied.

WARNING LIGHTS (CAB FACE)

Two (2) pair of Whelen Model 60RR6FRR red flashing LED lights with red lenses will be installed on the cab face, above the headlights, mounted in a common dual light housing.

There will be a switch located in the cab on the switch panel to control both sets of lights.

The flash pattern for the right side of these lights will flash separately from the left side of these lights.

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

DAYTIME RUNNING LIGHTS (HEADLIGHTS)

The low-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

There will be six (6) Whelen, Model 60*02F*R, flashing LED warning lights with chrome flanges located at the following positions:

- Two (2) Model 60RC6FCR, red LED and white LED lights with a clear lens located one (1) each side on the front cab corner.
    - The white LED portion of this light will be to the rear.
- Two (2) Model 60RR6FRR, red LED lights with red lens located behind the crewcab doors.
- Two (2) Model 60RR6FRR, red LED lights with red lens located over the rear wheels.

There will be a switch located in the cab on the switch panel to control the lights.

The white light will be disabled when the parking brake is set.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

SIDE WARNING LIGHTS

There will be four (4) Whelen, Model 3S*00F*R LED flashing lights provided.

The lights will be located outside lower corners on each door.

The color of the lights will be amber.

The color of the lenses shall be the same color as the LED's.

The lights will be with a Whelen, Model 3FLANGEC surface mount chrome flange.

Each light will be activated by the door jam switch of the associated door.

SIDE WARNING LIGHTS

There will be two (2) Whelen, part number 01-06864085RR, 7.12" high x 9.12" long x 1.38" deep flashing warning lights with red LED's and chrome trim provided one each side, front and high on body.

The lights will be controlled by a switch in the cab.

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

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen, Model 60RR6FRR, flashing LED warning lights with Whelen, Model 6EFLANGE, chrome flanges located at the rear of the apparatus.

The color of these lights will be red with a red lens.

There will be a switch, located in the cab on the switch panel to control these lights.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

REAR WARNING LIGHT(S)

There will be two (2) Whelen 60RR6FRR red LED , 4.12" high x 6.50" long light(s) with red lenses and chrome trim provided at the rear of the apparatus rear upper body.

The right side of the light will flash independently of the left side of the light.

The lights will be activated with the rear upper warning switch.

This light may be load managed when the parking brake is applied.

REAR AND SIDE UPPER ZONE WARNING LIGHTS

There will be four (4) Whelen, part number 01-06864085RR, 7.12" high x 9.12" long x 1.38" deep flashing warning lights with red LED's and chrome trim at the rear and side of the apparatus.

- One (1) on the driver's side, side of the apparatus as high and close the rear as practical.
- One (1) on the driver's side, rear of the apparatus as high and close to the outside as practical.
- One (1) on the passenger's side, rear of the apparatus as high and close to the outside as practical.
- One (1) on the passenger's side, side of the apparatus as high and close the rear as practical.

These lights will include red lenses.

The lights include a special flash pattern.

There will be a switch in the cab on the switch panel to control the lights.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen, Model TAL65, 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

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

The auxiliary warning mode will be activated with the emergency master switch.

This traffic directing light will be recessed at the rear of the apparatus as high as practical.

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

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

REFRIGERATOR

There will be a Norcold Model NR751BB, AC/DC 2.7 cubic foot refrigerator with black painted exterior installed in the apparatus at the command desk with exact location determined at construction visit.

There will be a 15 amp, 120 volt AC straight blade receptacle, powered from the shoreline, installed near this refrigerator to supply the AC power.

There will be a 10 amp 12 volt DC Deutsch plug and connector, powered with ignition, installed near this refrigerator to supply the DC power.

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 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 144.00" (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 degree 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 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (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 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (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 30.00" (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 Standard

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 an independent third-party certification organization.

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

There will be a Onan 12.0 kW, Model HDKCD, 120/240 volts AC, single phase 60HZ diesel powered generator provided.

The size of the generator will be 41.50" long x 24.50" wide x 27.00" high at 792 pounds.

Fuel Requirements

The fuel supply will be the chassis fuel tank or an additional tank, if so requested.

Exhaust

The muffler will be mounted outside the generator compartment and will discharge away from any operator's position.

Type of Cooling System

The generator will be liquid cooled with discharge and intake air from the bottom of the generator.

Cooling Requirements

The air outlet requirements will not be less than 51 square inches. The fresh air inlet will not be less than 216 square inches.

Shutdown:Low oil pressure and high engine temperature.

The continuous duty rating will be 10,984 Watts.

Generator Monitors

To properly monitor the generator performance and load demands during operation, the generator will be equipped with a full instrument and control package. This panel will be mounted adjacent to the load center. The following instruments will be installed in the panel:

- One (1) Voltmeter
- Two (2) Ammeters
- One (1) Frequency Meter
- One (1) Hour Meter
- One (1) "Power On" Green Indicator Light
- Two (2) Fuse Holders: With two (2) amp fuses for gauge protection

Operating Criteria

Rating at 104 degree F ambient. Intake and discharge cooling air from the bottom. Generator will be mounted to compartment floor that is unobstructed below the body.

The generator will be located in an area for air intake, discharge, and muffler from the bottom. Service side will be the front, at the compartment door opening.

GENERATOR LOCATION
The diesel generator will be installed on the roof of the body at driver's side. Special supports and ventilation will be provided under and around the generator to allow for proper generator operation.

ELECTRIC START PROVISION
Electric start provisions will be furnished for the generator from the chassis battery system.

GENERATOR REMOTE START
Generator preheat, along with a start and stop switch, will be provided near the circuit breaker box and in the command cab under the driver's side window. These switches will be in addition to the controls on the generator. A light will be provided to indicate that the generator is running.

CIRCUIT BREAKER PANEL
A circuit breaker panel will be installed in the D2. A directory for each breaker will be provided adjacent to the circuit breaker panel. Identification of circuits will be done in a durable manner that provides years of service.

GROUND FAULT CIRCUIT INTERRUPTER
The specified 220 volt, 50Hz option 30 amp outlets shall be supplied with a ground fault circuit interrupter (GFCI) circuit breaker.

The total quantity shall be two (2) circuit breakers.

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

GROUND FAULT CIRCUIT INTERRUPTER
The specified 120 volt option all 120 volt will be supplied with a ground fault circuit interrupter (GFCI) circuit breaker.

The total quantity will be 15 circuit breakers.

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

SUB FEED CIRCUIT BREAKER BOX
A Cutler Hammer sub feed box will be supplied with current limiting circuit breakers to protect the on board circuits when an auxiliary power source is used. The sub feed box will distribute power to specific circuits in the vehicle.

Location will be D2.

GENERATOR COVER
The generator will be totally enclosed with a cover constructed of .125" bright aluminum treadplate. The cover will be louvered to provide adequate ventilation and have any necessary access doors for maintenance or operation of the generator.

240-VOLT LIGHTING

A Will-Burt Night Scan Powerlite elevated lighting system, Model NS 3.0-4000 OPT, will be provided.

Mast will be operated with a 12-volt DC and 20 psi regulated air from the chassis air system.

All electrical cables will be internal of the mast for better protection.

Control for the mast and the lighting system will be a hand held wired remote unit. It will be operable with a single hand for turn/tilt, up/down, and on/off. Length of the control cord will be 25 feet. The mast will automatically stow with a one touch Auto Stow feature. The remote will be located D2.

Weight of the unit will not exceed 155 pounds.

Four (4), 1000-watt, 240-volt AC quartz halogen Optimum lights will be mounted on the mast in a weatherproof directional lighting system that will have the ability to rotate 385 degrees and tilt 330 degrees. The light heads will have a dual tilt function, where the left and right sides can tilt independently in different directions or together in the same direction.

A label will be provided at the operator's location to indicate mast operation instructions, warning information, extended tower height from the ground and bulb replacement data.

Tower "LOOK UP" Light

A self contained 12 volt floodlight will be provided on the light tower. The light will turn on automatically when the tower is raised and turn off when the tower is lowered.

A total of one (1) light tower will be provided front of the body.

ELECTRIC CORD REEL

Furnished with the AC electrical system will be a Hannay, Series 1600, cord reel wired for a four (4) conductor cord. 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 push button switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A captive roller assembly to 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 one each side of body d2/P2, .

CORD
Provided for electric distribution will be two (2) lengths, one (1) for each reel, of 200 feet of yellow 10/4 electrical cord. A Hubbell L14-20, 20 amp, 120/240 volt, twist lock connector body will be installed on the end of the cord.

PORTABLE JUNCTION BOX
There will be four (4)-120 vac, 15 amp, twist lock receptacles, and a locator/indicator light provided in an outlet box. The junction box construction will be weatherproof and have flip-up covers lined with soft neoprene rubber at each outlet opening. The junction box will be a Circle-D, model PF-51 G.

Color of the junction box will be yellow.

A Hubbell 5-20, 20 amp, 120 volt, straight blade connector body.

A total of two (2) will be provided.

JUNCTION BOX HOLDER
There will be an aluminum junction box holder installed adjacent to the cord reel. A total of two (2) will be installed reel adjacent.

120 VOLT RECEPTACLE
There will be two (2), 15 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with waterproof flip up cover(s) installed D2/P2 forward wall just inside the door frame. The NEMA configuration for the receptacles will be 5-15R.

The receptacle(s) will be powered from the on board generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

POWER OUTLET STRIP
There will be five (5) Sentrex Model M6S, 15.50" long x 2.00" wide x 1.75" deep surge protected receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided one in each passenger's side rear lab overhead cabinet , D2 with exact location determined at construction visit, driver's side rear lab below overhead cabinet., rear comand area with exact location determined at construction visit.

The strip(s) selected will be powered from the onboard generator through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

POWER OUTLET STRIP

There will be two (2) Sentrex Model M5S, 24.00" long x 2.00" wide x 1.75" deep surge protected receptacle strip(s) with five (5) 15 amp 120 volt AC straight blade 90 degree receptacles provided in each of the hatch compartments on the forward wall of the cord reel enclosure facing into the hatch compartment.

The strip(s) selected will be powered from the onboard generator through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There will be two (2), 15 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior cover plate installed one each side of the lab, facing rear on the face of sink compartment. The NEMA configuration for the receptacles will be 5-15R.

The receptacle(s) will be powered from the generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There will be four (4), 20 amp 120 volt AC three (3) wire twist lock receptacle(s) with waterproof flip up cover(s) installed one each side and rear of body. The NEMA configuration for the receptacles will be L5-20R.

The receptacle(s) will be powered from the on board generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

240 VOLT RECEPTACLE

There will be two (2), 30 amp 240 volt AC three (3) wire twist lock receptacle(s) with waterproof flip up cover(s) installed one each side rear of body. The NEMA configuration for the receptacles will be L6-30R.

The receptacle(s) will be powered from the on board generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition, section 10.5.1 will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- One (1) SCBA complying with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, for each assigned seating position, but not fewer than two (2), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.

- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).

- One (1) first aid kit.

- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front.

- Five (5) fluorescent orange traffic cones not less than 28" (711 mm) in height, each equipped with a 6". (152 mm) retro-reflective white band no more than 4" (152 mm) from the top of the cone, and an additional 4" (102 mm) retro-reflective white band 2" (51 mm) below the 6" (152 mm) band.

- Five (5) illuminated warning devices such as highway flares, unless the five fluorescent orange traffic cones have illuminating capabilities.

- One automatic external defibrillator (AED).

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 10.5.2 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 10.5.2 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom body will be thoroughly cleaned and prepared for painting. Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface will be removed or filled and then sanded smooth for a smooth appearance. All seams will be sealed before painting.

2. Chemical Cleaning and Treatment - The aluminum surfaces will be properly cleaned using a four (4)-phase, high pressure and high temperature acid etching system. All steel surfaces will be properly treated using a three (3)-phase, high temperature, cleaning/phosphatizing system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse of 25 parts per million solids or less, will be applied to final rinse all metal surfaces at the conclusion of the metal treatment process. This final rinse ensures all chemical residues are removed and that no minerals, (salts), from the water dry onto the metal surface and remain under the primers and topcoats. These salts can lead to blistering and under film corrosion.

3. Primer/Surfacer Coats - A minimum of two (2) mil dry, (.002), of two component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong

corrosion protective base coat and to smooth out the surface. The primer is a high solids and low VOC paint.

4. Hand Sanding to Ultra Fine Finish - The primer/surfacer coat is lightly sanded with mild abrasive paper to an ultra smooth finish. This hand finish process is critical to produce the smooth mirror like finish in the topcoat.

5. Sealer Primer Coat - A two (2) component sealer primer coat is applied over the sanded primer to again build toward the final smooth finish. This layer of primer sealer also gives additional corrosion protection.

6. Topcoat Paint - Two (2) coats of an automotive grade, two component acrylic urethane paint are applied to provide the lasting beauty and durability. The acrylic urethane topcoat contains a clear coat resin chemistry that creates the high gloss and depth of image. This type of topcoat provides the best resistance against acid rain and other more common chemicals.

7. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied. Lap style doors will be clear coated to match the body. Roll-up doors will not be clear coated and the standard roll-up door warranty will apply.

A cyclic corrosion test, (General Motors test GM-9540), of 40 cycles will be required before making changes to the exterior coating process. Exterior coating systems, (excluding the undercarriage components), must achieve a 1/16 or less maximum creep from the scribe for aluminum and an 1/8 or less maximum creep from the scribe for galvanneal after 40 cycles in the General Motors GM-9540 test.

Each batch of color topcoat, together with the finish painted vehicle, is tested for precise color match. Visual color match will be checked following ASTM D-1729, (American Standard Testing Methods), procedures using CIE, (International Commission on Illumination), D75 Northern Daylight light source. Instrumental color match will follow ASMT D-2244 procedures with a maximum delta E of 1.0 for whites, 1.4 for yellows, blues, greens and 1.5 for reds.

All removable items such as brackets, compartment doors, door hinges, trim, etc. will be removed and painted separately to insure paint behind all mounted items. Body assemblies that can not be finish painted after assembly will be finish painted before assembly.

The cab and the body will be painted 107 red .

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous body items, an isolation tape or gasket material will be used to prevent damage to the finish painted surfaces. A nylon washer will be installed under each acorn nut or metal screw that is fastened directly to a painted body surface.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State (his) regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

Topcoats and primers will be chrome and lead free.

Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.

Particulate emission collection from sanding operations must have a 99.99 percent efficiency factor.

Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.

Water from water wash booths will be reused. Solids will be removed mechanically on a continual basis to keep the water clean.

Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.

Empty metal paint containers will be cleaned, crushed and recycled to recover the metal.

Solvents used in clean-up operations will be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation will be used as fuel in off-site cement kilns.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be painted 107 red before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be painted are:

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure

- Air tanks
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

The E-coat process will meet the technical properties shown.

COMPARTMENT INTERIOR PAINT

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

The reflective band provided on the cab face will be at the headlight level.

CHEVRON STRIPING, REAR

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The entire rear surface will be covered.

The colors will be lemon yellow and ruby red reflective.

Each stripe will be 6.00" in width.

This will meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

REFLECTIVE STRIPE, CAB DOORS

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

REFLECTIVE STRIPE, HDR BODY DOOR(S)

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each body entry door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

The stripe will be provided on three (3) entry door.

This stripe will meet the NFPA 1901 requirement.

LETTERING
The lettering will be totally encapsulated between two (2) layers of clear vinyl.

LETTERING
Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, with outline and double shade will be provided.

LETTERING
There will be reflective lettering, 14.00" high, with outline and shade provided. There will be two (2) letters provided.

LETTERING
There will be genuine gold leaf lettering, 10.00" high, with outline and double shade provided. There will be 40 letters provided.

LETTERING
There will be reflective lettering, 10.00" high, with no outline or shade provided. There will be ten (10) letters provided.

EMBLEMS
An American flag emblem, 4.00" high x 7.00" wide, will be installed match 26098. The flag will appear to be moving in the wind.

MALTESE CROSS INSTALLATION
There will be one (1) pair of maltese crosses, comprised of genuine gold leaf material, provided and installed on front cab doors.

MANUAL, FIRE APPARATUS PARTS
Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

The manual will contain the following:

- Job number

- Part numbers with full descriptions

- Table of contents

- Parts section sorted in functional groups reflecting a major system, component, or assembly

- Parts section sorted in Alphabetical order

- Instructions on how to locate a part

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

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

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

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

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY

A Detroit Diesel **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

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

FIFTEEN (15) YEAR STRUCTURAL INTEGRITY

The Pierce heavy duty rescue apparatus body limited warranty certificate, WA0010, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

FIVE (5) YEAR GENERATOR WARRANTY

There will be a 5 year limited warranty provided for Onan hydraulic and Protec generators.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

Pierce manufacturing will provide a cab crash test certification with this proposal. The certification states that the cab must meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks

- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks

- Roof Crush

The cab will be subjected to a roof crush force of 100,000 lb. This value will be 450 percent of the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of ten (10) metric tons.

- Side Impact

The cab will be subjected to dynamic preload with a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of energy. This test will closely represent the forces a cab will see in a rollover incident.

- Frontal Impact

The cab will withstand a frontal force produced from 65,200 ft-lb of energy using a swing-bob type platen.

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

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The

bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

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

The manufacturer of the apparatus will provide the following:

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

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

HGACBuy	CONTRACT PRICING WORKSHEET For MOTOR VEHICLES Only	Contract No.:	FS12-13	Date Prepared:	1/20/15

This Worksheet is prepared by Contractor and given to End User. If a PO is issued, both documents ***MUST*** *be faxed to H-GAC @ 713-993-4548. Therefore please type or print legibly.*

Buying Agency:	City of San Diego	Contractor:	Pierce Manufacturing
Contact Person:	Jeff Mitchell	Prepared By:	Kevin Newell
Phone:	858/573/1409	Phone:	909-673-9900
Fax:		Fax:	909-673-9700
Email:	JJMitchell@sandiego.gov	Email:	kevin@southcoastfire.net

Product Code:	UA04	Description:	Pierce Arrow 4-door, tandem axle, 105 rear mounted ladder , 500#

A. Product Item Base Unit Price Per Contractor's H-GAC Contract: $804,930.00

B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description if applicable.
(Note: Published Options are options which were submitted and priced in Contractor's bid.)

Description	Cost	Description	Cost
		SEE OPTIONS TAB OF THIS WORKSHEET	$181,631.00
		Subtotal From Additional Sheet(s):	
		Subtotal B:	$181,631.00

HGACBuy
THE SMART PURCHASING SOLUTION

C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.
(Note: Unpublished options are items which were not submitted and priced in Contractor's bid.)

Description	Cost	Description	Cost
		SEE OPTIONS TAB OF THIS WORKSHEET	$5,187.00
		Subtotal From Additional Sheet(s):	
		Subtotal C:	$5,187.00

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B). **For this transaction the percentage is:** 0.53%

D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C)

Quantity Ordered:	2	X Subtotal of A + B + C:	991748	=	Subtotal D:	$1,983,496.00

E. H-GAC Order Processing Charge (Amount Per Current Policy) Subtotal E: $2,000.00

F. Trade-Ins / Other Allowances / Special Discounts / Freight / Installation

Description	Cost	Description	Cost
		Sales tax 8%	$158,679.68
		tire fee	$35.00
		Subtotal F:	$158,714.68

Delivery Date:	G. Total Purchase Price (D+E+F):	$2,144,210.68

Pierce Manufacturing is pleased to submit a proposal to **City of San Diego** for a **Pierce® 105' Heavy Duty Aerial Ladder.** The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

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 all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever 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 edition 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 five (5) 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 South Coast Emergency Vehicle Service 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 twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, 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.

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 sheet metal 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.

PUMP TEST

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

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.

INSPECTION TRIP(S)

The bidder will provide three (3) factory inspection trip(s) for twelve personnel customer representative(s). The inspection trip(s) 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.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. 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.

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 one (1) hard copy of these diagrams required for this unit.

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

Single truck order (no credit) in this order for multiple order credit.

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 143 inches.

MAXIMUM OVERALL LENGTH
The maximum overall length of the apparatus will be 486 inches.

ANGLE OF APPROACH
The angle of approach will be 13.5 degrees. This will be effective with the truck in a loaded state.

ANGLE OF DEPARTURE
The angle of departure will be 13.5 degrees. This will be effective with the truck in a loaded state.

WHEELBASE
The wheelbase of the vehicle will be 233.5.

GVW RATING
The gross vehicle weight rating will be 71,800 lbs.

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 0.38" 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 0.25". 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 in-lb.

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

FRONT NON DRIVE AXLE
The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000 psi yield strength 8630 steel and the lower control arm casting will be made of 55,000 psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000 psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing shall be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

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

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

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

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

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS
KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

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 XFE wide base tread, rated for 22,800 lb 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-46-160, tandem axle assembly with a capacity of 48,000 lb.

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

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
The rear suspension will be a Hendrickson HN FR VariRate spring system with an equalizing beam design that distributes the load equally between the two (2) axles. The ground rating of the suspension will be 48,000 lb.

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

REAR TIRES
The rear tires will be eight (8) XZY3 Michelin 12R22.50 radials, 16 ply all position tread, rated for 54,240 lb maximum axle load and 65 mph maximum speed.

The tires will be mounted on 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud-11.25" bolt circle. The wheels will be Alcoa part number 893602, hub piloted.

TIRE BALANCE
All tires will be dynamically balanced with wheel weights.

TIRE PRESSURE INDICATOR
NFPA 1901, 2009 Edition, section 4.13.4 requires each tire be equipped with a visual indicator or monitoring system that indicates tire pressure.

Per Fire Department specification, a tire pressure indicator is not on the apparatus as manufactured. This apparatus will be non-compliant to NFPA 1901 standards effective at time of contract execution.

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

HUB COVERS (REAR)
Realwheels, RW7715, foam mounted, stainless steel, high hat, hub covers will be provided on the rear axle hubs.

LUG NUT COVERS
Stainless steel lug nut covers will be installed on all lug nuts.

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, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS
There will be two (2) pairs of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model 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 match job number 24025.

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.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™, Disc Plus, EX225 disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Bendix®, Model BA-921, with 15.80 cubic feet per minute output at 1,250 rpm.

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
- A pressure protection valve will be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).

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.

- Midland Pure Air Plus air dryer, Model N4250. Air dryer will consist of the following:
- Spin-on desiccant cartridge
- Coalescing filter that is replaceable and separate from the spin-on desiccant can
- 12 volt heated moisture ejector

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.

High pressure, wire braid reinforced flexible rubber air lines will be provided from the frame to each brake chamber.

The brake lines will not be painted.

AIR INLET

One (1) air inlet with male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located in the driver side lower step well of cab. The inlet will be located in the rear of the step area in rear of the step light. 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

Two (2) air outlets will be installed with a female coupling and shut off valve, located in the driver side and passenger side lower step well of 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.

AIR INLET FITTING

The fitting used for the air inlet will be a Amflo CP-20 brass fitting.

ALL WHEEL LOCK-UP

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

ADDITIONAL AIR TANK

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.

CHECKVALVE AT WET TANK
A check valve will be installed between the air dryer and wet tank.

AIR CHECK VALVES
Bendix DC-4 double check valves will be used on the primary and secondary air tanks.

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.

ALL WHEEL LOCK-UP
An all wheel lock-up system will be installed which applies air to the front brakes and uses the spring brake at the rear.

The front wheel lock will be an air valve on the dash panel in place of the standard rocker switch. A "Front Wheel Lock" label will be installed to the right side of the valve control knob that is visible to the driver.

This will not be an electrical version.

TELMA COTROL HANDLE &LABELING
The telma control lever will be reduced in length by 50% and a label will be added for the control lever. Increase/Decrease

TELMA COTROL HANDLE &LABELING
The telma control lever will be reduced in length by 50% and a label will be added for the control lever. Increase/Decrease

LABEL, AIR TANKS
There will be a stick-on style label provided on all of the chassis air tanks to identify the function a particular tank provides to the chassis (quick build up, isolated, chassis air supply, etc.).

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

Make:	Detroit™
Model:	DD13®
Power:	500 hp at 1800 rpm
Torque:	1650 lb-ft at 1200 rpm
Governed Speed:	2080 rpm
Emissions Level:	EPA 2013
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	781 cubic inches (12.8L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor
Coolant Filter:	Cartridge style with shut off valves on the supply and return line

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, medium and low setting.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

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

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.

AIR CLAMPS CONSTANT TORQUE
All air clamps will be constant torque type clamps.

WIRE BRAIDED ENGINE OIL DIPSTICK
The engine oil dip stick will be wire braided for easy removal. The dip stick will be the same type as the transmission dip stick.

ENGINE STARTER
The engine starter will be interlocked so that the starter cannot be engaged when the engine is running.

ENGINE FOOT THROTTLE
The engine foot throttle will engage when the transmission is shifted into the neutral position. and the parking brake is set.

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

EXHAUST SYSTEM
The exhaust system will be stainless steel from the turbo to the inlet of the selective catalytic reduction (SCR) device, and will be 5.00" in diameter. The exhaust system will include a diesel particulate filter (DPF) and an SCR device to meet current EPA standards. 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 tail pipe will be at a 45 degree angle rearward, extend a minimum of 3.00" past the side of the body, and will discharge the exhaust horizontally. The last 7.00" of the tail pipe will be free of any restriction of hangers or clamps to ensure an easy deployment of an exhaust extraction hose. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. The diffuser will include a 5.00" diameter tip for connection to an exhaust extraction system.

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

EXHAUST WRAP
The exhaust pipe will be wrapped with a stainless steel exhaust wrap at the cross over 90 degree elbow 15.00" forward and 3.00" beyond the 90 degree bend to reduce the pipe temperature approximately 600 degrees.

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 1,396 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.

PETCOCK EXTENSION

The petcock will be extended so that the petcock can be accessed and the coolant can be emptied strait down to the ground.

FUEL TANK

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

A 0.75" drain plug will be located in a low point of the tank for drainage.

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

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

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

A 0.50" 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, brushed 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 COOLER

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

The fuel filler door will include a holder for the fuel fill cap.

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 Champ® shell and tube transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The cooler will have an aluminum shell and copper tubes. The cooler will be assembled using two (2) pressed in rubber tube sheets (one on each end), creating a reliable mechanical seal between the coolant and the oil. No brazed, soldered, or welded connections will be used to separate the coolant from the oil.

TRANSMISSION DIP STICK ACCESS

The transmission dip stick and tube will be positioned for easy access and removal in the cab access door opening. The top of the stick and tube will be painted Red with a label on the access door

TRANSMISSION PROGRAM

The transmission will shift to neutral when parking brake is set.

TRANSMISSION SHIFT MODE

The transmission mode button on the shifter will be blacked out.

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. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, 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 WHEEL

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

LOGO AND CUSTOMER DESIGNATION ON HORN BUTTON

The steering wheel 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: San Diego

The second row of text will be: Fire Rescue

The third row of text will be: Blank

CHASSIS LUBRICATION DRUM PUMP KIT CREDIT
A Vogel, Model #9900-004-002, drum pump kit will not be supplied with the system.

LABEL VOGEL LUBE SYSTEM
A label will be installed on the vogel lube system stating the type of grease to be used (NLGI-00) and stating "Shop Fill Only"

AUTOMATIC CHASSIS LUBRICATION
An SKF MonoFlex™ lubrication system for the chassis will be provided. A electronic control unit will activate the pump after an adjustable interval time. The control unit will control and monitor the pump operation and report any faults via an indicator light on the aerial operator position.

A pump supplies the lubricant to the lubricant distributors via the main feed line. The lubricant is then metered and fed to the lubrication points. This takes place after the pump operation time, through re-lubrication distributors. During the lubrication cycle, the lubricant is pumped into the feeders' storage chambers, where it is then stored. Only after the pressure is relieved in the main line, the lubricant is dispensed under spring tension to the lubrication points (re-lubrication effect).

The reservoir will be easily accessible for service. Reservoir will be protected from damage caused by anything that may be stored in the vicinity. Power cables and main lube line will have strain relief provided.

It will consist of a transfer system, one (1) pail of grease (NLGI-00) and five (5) lubrication points.

The lubrication system reservoir will be located match 23215 on the apparatus.

- Independent suspension control Arm Pivot Points

-Rear Axle Slack Adjusters

-Rear Axle Brake Cam Screws

- Rear Suspension Spring Pins

- Rear Suspension Shackle Pins

-Walking Beam Pins (Tandem axle, if applicable).

SKID PLATES
Steel skid plates will be provided under the cab lift cylinders to protect them from damage. The plates will be bolted on to facilitate easy removal and replacement.

GUARD AIR HOSE WITH FIRE RESISTANT WRAP

Guards shall be provided at the drivers front corner of the cab to provide an enclosure for the air hoses goining from the junction block to the cab. The Synflex hose will be wrapped with fire resistant loom from the mnifold block to where it enters the cab.

BUMPER

A one (1) piece, ten (10) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame.

The bumper will be extended 24.00" from front face of cab.

The bumper extension frame will be fabricated using .38" gussets welded to 2.00" x 5.00" steel tubing running front to back with .50" front and rear plates mounted to the chassis frame. Fabricated "U" shaped channel supports the weight of the bumper and provides the main strength in frontal crash. .25" steel is formed into "C" shaped backing plates for mounting of the bumper and providing protection to the cab.

The bumper extension's cross section is considered expendable, and a crush zone. The bumper is not intended for pushing other vehicles or objects.

Tow hooks/eyes located under the bumper extension are for straight pull only.

GRAVEL PAN

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

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 HOOKS

No tow hooks are to be provided. This truck will be equipped with a lift and tow package with integral tow eyes.

CAB

The Arrow XT 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 overall height (from the cab roof to the ground) will be approximately 103.00". 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 floor to ceiling height inside the crew cab will be 54.00" in the center and 59.25" 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 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 0.50" aluminum. The top will be constructed of 0.19" 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.

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 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.

The controls will be located in the drivers side cab step well.

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 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.

Cab Lift Interlock

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 battery switch is in the on position. The cab tilt switch will be disabled if the parking brake is released or the ignition switch is turned on.

CAB LIFT LABEL

A label will be provided on the side of the cab lift control. The label will read:

Cab Lift Operation

Battery "ON"

Ignition "OFF"

Ignition does not need to be "ON" to operate cab lift

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.

KICK PLATE

A brushed aluminum kick plate will be installed on the electrical access panel door on the officer side.

SCUFFPLATE

A treadplate scuffplate will be installed on the top edge of both rear facing seat risers. The scuffplate will be flanged to the front to protect the painted edge of the seat riser.

SIDE OF CAB MOLDING

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.

DOORS

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 61.75" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" 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 0.38" 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.

ELECTRIC CAB DOOR LOCKS

The front driver and passenger doors will have a door lock master switch built into the interior door latch that will control all front and rear side exit door locks. Each rear cab door will have its own lock control. Each door will have a keyed exterior lock mechanism built into the door handle assembly.

The lock system will include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system will use code hopping technology for high security and be FCC part 15 compliant.

One (1) additional momentary switch will be installed in passenger stabilizer control compartment that trigger the cab, crew cab and body compartment door locks

The lock switch on the instrument panel will be labeled "Master Lock"

DOOR LOCKS

All the cab door and body door locks will lock and unlock with a single switch at PS rear stabilizer compartment on the vertical outboard compartment wall. Switches will be Blank no label. The switch in the cab will be labeled "Master Locks" and have labels for "Lock and "Unlock"

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 strut insert 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.

STEP LIGHTS

There will be eight (8) Whelen, Model 0ACOEDCR, round LED step lights provided with 45 degree chrome bezels to direct the light downward.

The lights will be installed in the cab and crew cab at the following locations:

- Two (2) in the driver side front doorstep.
- Two (2) in the driver side crew cab doorstep.
- Two (2) in the passenger side front doorstep.
- Two (2) in the passenger side crew cab doorstep.

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

INTERIOR CREW CAB DOOR HANDRAIL

A handrail will be provided on each interior crew cab door pan. The handrails will be mounted at a 45 degree angle. These are in addition to the standard crew cab door handle.

CREW CAB WINDOWS

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

WINDOW TINT

Crew cab windows will be tinted with 44 percent light transmission tint. The following windows are included:

- Crew cab side windows

- Crew cab door, roll-up windows

- Rear opera windows (if applicable).

STORAGE COMPARTMENTS

Provided on each side of the cab, to the rear of the crew cab access doors, will be a storage compartment. The compartments will be 11.25" wide x 19.00" high x 13.00" deep.

A false floor will be added to the bottom of this compartment to create a sweep out floor. The false floor will decrease the dimensions of the compartment.

The doors will be painted aluminum, single pan construction with one (1) one D-ring handle slam style latch. Each door will have a gas strut placed horizontally to hold the door in the open position.

The compartment door will be tied to the "Do Not Move Truck" indicator when opened.

EQUIPMENT MOUNTING SHELVES

There will be two (2) shelves for permanent mounting of equipment provided.

Shelves will be mounted flat on top of the engine cover.

The shelves will be located on the driver's and passenger's side in the crew cab.

The shelves will be supported by cross bracing to keep the area under the shelves open. The shelves will be 26.50" long front to back and as wide as space allows from side to side. Shelves will extend from the front edge of the mux box on the driver's side and the front edge of the air tunnel on the passenger's side to the front edge of the crew cab door opening on each side.

Each shelf will have a 2.00" lip around edge.

Each shelf will be fabricated from .188" aluminum and will be painted to match the cab interior.

CAB INTERIOR

The left and right side dash and center console will be a flat faced design to provide easy maintenance and will be constructed out of painted aluminum.

The engine tunnel will be padded and covered with Imperial 1200 vinyl coated polyester.

The headliner will be installed in both forward and rear cab sections. Headliner material will be Imperial 1200 vinyl coated polyester. A sound barrier will be part of its composition. Material will be installed on an 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 upholstery will be maroon woven with black.

CAB INTERIOR PAINT

A rich looking interior will be provided by painting all the metal surfaces inside the cab black, vinyl texture paint.

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 0.25" 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 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 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 each will be provided in the cab. The heaters will have a 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, 24-volt DC customized air conditioning system will be furnished inside the cab and crew cab. A 19.10 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 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 (1) plenum directed to the front and one (1) 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 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.

SUN VISORS
There will be two (2) vinyl covered sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

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 lower hadle will be spaced out to allow proper hand clearence. 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.

OPEN TOP STORAGE BIN
An open top bin, will be installed match 23215. The bin will be 4.00" wide x 6.00" deep x 3.00" high. The bin will be constructed of .125" aluminum and will be painted to match the cab interior.

MAP BOX
A map box with four (4) bins, open from top, will be installed on the engine tunnel. The map box will be 24.00" wide x 30.00" deep x 8.00" high. The map box will be constructed of .125" aluminum and will be painted to match the cab interior.

The map box will be constructed to include a panel to enclose the space at the driver side rear edge of the engine tunnel between the map box bottom and engine tunnel.

The map box will have a permanent divider at 12.00" from the forward side of the box. The map box will have two (2) different permanent dividers splitting the compartment on each side of the permanent divider at 12.00" from the forward side of the box. A permanent divider will separate the forward portion of the map box into 11.00" wide on the driver side and 13.00" on the passenger side. The rear portion of the box will be split equally into 12.00" wide sections.

Each compartment will contain slots for movable dividers to be placed at half inch increments. The forward driver side compartment will have slots to insert dividers running forward to back. The remaining three (3) compartments will have dividers that run side to side. There will be a total of three (3) 13.00" wide dividers and 16 12.00" wide dividers.

A total of four (4) cutouts, 3.00" wide by 6.00" deep with a 3.00" curve radius will be supplied on the rear of the map box. The cutouts will terminate 2.00" from the bottom of the map box.

SEATING CAPACITY

The seating capacity in the cab will be five (5).

DRIVER SEAT

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt. 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 SEAT

A seat will be provided in the cab for the passenger. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will be provided with 6.00" double locking fore/aft slide adjustment. The seat back will be a high back style with 9 degree fixed recline angle and side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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 SIDE OUTBOARD SEAT

There will be one (1) forward facing, foldup seat provided at the driver side outboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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 SIDE OUTBOARD SEAT

There will be one (1) forward facing foldup seat provided at the passenger side outboard position in the crew cab. The seat back will be a high back style with 9 degree fixed recline angle. For optimal comfort, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and designed with EVC (elastomeric vibration control). 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 be furnished with a 3-point, shoulder type seat belt. 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.

MATTING IN EMS COMPARTMENT

Turtle Tile vinyl matting will be provided in two (2) EMS compartment shelves. Tile color will be red.

The matting will be .50" thick and be cross bonded by .25" diameter ribbed sections spaced for aeration.

COMPARTMENT LIGHTING

There will be two (2) single 9.00" On Scene Solutions, Model Night Stick, LED lights provided in the to the cieling of each open area. See Jpeg file in the job file..

A rocker switch and the crew cab doors will turn on the lighting on.

SEAT UPHOLSTERY

All seat upholstery will be maroon woven with black Imperial 1200 material.

SEAT EMBROIDERY

The seats in the cab and crew cab will be provided with custom embroidery. The Fire Department will determine what the embroidery will be by providing pictures at the time of order.

The embroidery will be provided on five (5) seats.

FOOT REST ANGLE

A knurled handrail type will be provided for the officers position. The handrail will be mounted to the engine housing with a flat stanchion and a "U" shaped bracket. The handrail will extend the width of the officers seat area. The foot rest will be positioned approximately 4.00" from the forward wall.

FOLD UP SEAT

In addition to the stationary crew cab seats one (1) fold up seat with a retractable 3 point seat belt will be provided on the rear wall in the center position. The seat will be lowered for head clearance in a flat roof cab.

The seat will be constructed of a heavy grade vinyl over foam rubber and will have the bottom covered with brushed stainless steel for a pleasant appearance when the seat is in the up position.

The seat will also include a 2.00" thick, foam rubber, back and head rest.

FORWARD FACING OUTBOARD SEAT

The forward facing seat frames will be shortened to allow 24.00 of clearance between the forward facing outboard seat and the rear facing seat riser. The seat frame will be modified to raise the seat approximately 3.00 to 4.00" off the floor of the rear of the cab. The seats will be fastened to the rear cab wall with Four (4) 3/8" grade 8 hex head bolts and AVK fasteners.

SEAT BELTS

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

The belts will also include the Ready Reach® D-loop assembly to the shoulder belt system. The Ready Reach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 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 BELT MONITORING ON COMMAND ZONE COLOR DISPLAY

A seat belt monitoring screen will be provided on the Command Zone color display. The system will be capable of monitoring up to ten (10) seating positions in the cab with green and red seating icons illuminated as follows:

Seat OccupiedBuckledGreen Icon

Seat OccupiedUnbuckledRed Icon

Seat Not OccupiedBuckledRed Icon

Seat Not OccupiedUnbuckledNo Icon

The seat belt monitoring screen will become active on the Command Zone color display when:

The park brake is released:

And

There is any occupant seated but not buckled or any belt buckled without anoccupant:

And

There are no other Do Not Move Truck conditions present. As soon as all Do NotMove Truck conditions are cleared, the seat belt monitoring screen will beactivated.

The seat belt monitoring screen will be manually selected anytime the Command Zone color display is powered.

The seat belt monitoring screen will be accompanied by an audible alarm that will activate when a red seat icon condition exists and the parking brake is released.

HELMET STORAGE, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 14.1.8.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker™, Model 30**4, chrome LED spotlights located on the cab roof, match 28068. The spotlights will be mounted to the surface of the cab roof.

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

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver and one (1) within reach of the officer.

HAND HELD LIGHT

There will be four (4) Streamlight E-Spot FireBox Vehicle Mount Systems, Model 45865, LED hand held flashlights with an orange thermoplastic body provided.

The location will be one each side below the outboard forward facing seats as far to the inside as possible with the bulb facing rear ward and one each side on the step up inside of the forward facing outboard seats bulb rear ward..

The system will include the handlight, a charger and the vehicle mount system.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of 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 directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

CAB INTERIOR

The wrap-around style high impact ABS plastic cab dash fascia will be designed to provide unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

GAUGES

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

- Voltmeter Gauge (Volts):
    - Low volts (11.8 VDC)
        - Amber indicator on gauge assembly with alarm
    - High volts (15 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very low volts (11.3 VDC)
        - Amber indicator on gauge assembly with alarm
    - Very high volts (16 VDC)
        - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel Level Gauge (Empty - Full in fractions):
    - Low fuel (1/8 full)
        - Amber indicator on gauge assembly with alarm
    - Very low fuel (1/32) fuel
        - Amber indicator on gauge assembly with alarm
- Engine Oil Pressure Gauge (PSI):
    - Low oil pressure to activate engine warning lights and alarms

        - Red indicator on gauge assembly with alarm
- Front Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm
        - Red indicator on gauge assembly with alarm
- Rear Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm.
        - Red indicator on gauge assembly with alarm
- Transmission Oil Temperature Gauge (Fahrenheit):
- High transmission oil temperature activates warning lights and alarm
    - Amber indicator on gauge assembly with alarm
- Engine Coolant Temperature Gauge (Fahrenheit):
    - High engine temperature activates an engine warning light and alarm
        - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. 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)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)
- The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

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

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up 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:

- Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
- Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.
- Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel back lighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not

affect the back lighting intensity. The third switch position increases the panel back lighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications:

- High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. 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.
- The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.
- 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 disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be 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.
- 4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.
- Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.
- Parking brake control: An air actuated push/pull park brake control valve will be provided.
- 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 four (4) switch panels in the engine tunnel console facing the driver, up to three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

A diagnostic panel will be accessible while standing on the ground and 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)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature. The upper right section will display odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

- Officer Speedometer, A Class I digital display speedometer will be provided on the officer 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 have two (2) labeles to read "Do Not Move Apparatus If Light Is On." the labels will be positioned one each side of the light facing the driver and officer so that they are easy to read.

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

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Hatch Door Open
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated red whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL
For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will 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 SWITCH
A PTO switch for the aerial with indicator light will be provided.

SPARE CIRCUIT
There will be two (2) 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 50 amps at 12 volts DC.

Power and ground will terminate one under each shelf on the PS crewcab wall see pictures.

Termination will be a .38" isolated stud that is less than 1.38" in total length.

Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT
There will be nine (9) 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 two between the driver and officer in switch panel #9, one on the side of dash facing the officer, three on the rear face of the driver's side crewcab shelf support. 3 added at pick -up installed in compartment P2..

Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT

There will be one (1) 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 20 amps at 12 volts DC
- Power and ground will terminate one in P1 rear ward at the shelf level
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125% of the protection

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

SPARE CIRCUIT

There will be four (4) 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 one adjacent to the each crewcab seat and one in D3 at the forward shelf level..

Termination will be with heat shrinkable butt splicing.

Wires will be sized to 125 percent of the protection.

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

14 GAUGE SPARE WIRE

There will be a pair of 14 gauge wires, one (1) with black insulation and one (1) with white insulation, included in a separate loom installed in the apparatus.

These wires will be routed from from the electrical distribution under the shelf on the PS crewcab wall and extended to switch paneles overhead above the officer.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

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 one each inside the crewcab seat box, one to the outside of the driver's seat risor, power is to be obtained from the PS crewcab wall.
- Termination will be with heat shrinkable butt splicing
- 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 one (1) 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 20 amps at 12 volts DC.

Power and ground will terminate in P2 rear wall bottom shelf.

Termination will be with heat shrinkable butt splicing.

Wires will be sized to 125% of the protection.

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

SPARE WIRE
There will be one (1) Belden Model 8723 060 cable installed in the apparatus.

This cable will be routed from electrical distribution under the shelf on the PS wall and extended to switch panels over the officer's position.

These wires will not be connected to any power source and will not be connected to the vehicle electrical system.

EMERGENCY LIGHT SWITCHES
The emergency light switching will work as follows: The emergency master switch must be activated for all emergency lighting to function.

The emergency master "saved states" feature will not be activated. This means that if the emergency master switch is on and individual switch is turned off. Then the emergency master is turned off, upon

turning the emergency master switch back on the individual switch which was previously turn off will turn back on.

All emergency lighting will be turned on whenever the emergency master switch is turned on.

Individual emergency light switches may be deactivated and/or reactivated after the emergency master switch is turned on.

Switches will be per the following: Emergency Master, Lightbar, Front Warning, Side Warning, Rear Warning, High Beam Flash will be combined with Front Warning, Upper & Lower Rear Warning will be combined under Rear Warning.

INFORMATION CENTER

An information center employing a 7.00" diagonal color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display
- Display can be changed to an available foreign language

OPERATION

The information center will be designed for easy operation for everyday use.

The page button will cycle from one screen to the next screen in a rotating fashion.

A video button will allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed will return the information center to the vehicle information screens.

A menu button will provide access to maintenance, setup and diagnostic screens.

All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition

- Exterior Ambient Temperature
- Time (12 or 24 hour mode)
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text.

PAGE SCREENS

The Information center will include the following screens:

- Load Manager Screen
  - A list of items to be load managed will be provided. The list will provide:
  - Description of the load
- Individual Load Shed Priority Screen
  - The lower the priority number the earlier the device will be shed should a low voltage condition occur
- Load Status Screen
  - The screen will indicate if a load has been shed (disabled) or not shed.
  - "At a Glance" color features are utilized on this screen
- Do Not Move Truck Screen
  - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:
    - Driver Side Cab Door
    - Passenger's Side Cab Door
    - Driver Side Crew Cab Door
    - Passenger's Side Crew Cab Door
    - Driver Side Body Doors
    - Passenger's Side Body Doors
    - Rear Body Door(s)
    - Ladder Rack (if applicable)
    - Deck Gun (if applicable)
    - Light Tower (if applicable)
    - Hatch Door (if applicable)
    - Stabilizers (if applicable)
    - Steps (if applicable)
- Chassis Information Screen
  - Engine RPM
  - Fuel Level
  - Battery Voltage

    - Engine Coolant Temperature
    - Engine Oil Pressure
    - "At a Glance" color features are utilized on this screen
- Active Alarms List
    - This screen will show a list of all active text messages. The list items text will match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

MENU SCREENS

The following screens will be available through the Menu button:

- System Information
    - Battery Volts
    - Pump Hours
    - Transmission Oil Temperature
    - Pump Engaged
    - Engine Coolant Level
    - Engine Oil Level
    - Oil level will only be shown when the engine is not running
    - Power Steering Level
- Display Brightness
    - Brightness
        - Increase and decrease
        - Default setting button
- Configure Video Mode
    - Set Video Contrast
    - Set Video Color
    - Set Video Tint
- Startup Screen
    - Choose the screen that will be active at vehicle power-up
- Date & Time
    - 12 or 24 hour format
        - Set time and date
- View Active Alarms
    - Shows a list of all active alarms
        - Date and time of the occurrence is shown with each alarm
    - Silence alarms
        - All alarms are silenced
- System Diagnostics
    - Module type and ID number
    - Module version
- Module diagnostics information
    - Input or output number
    - Circuit number connected to that input or output

- Circuit name (item connected to the circuit)
- Status of the input or output
- Power and Constant Current module diagnostic information

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing vehicle information.

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

INTERCOM SYSTEM

A five (5) position David Clark, Model U3800, intercom system with single radio interface capability at the driver position and dual radio interface capability at the officer position will be provided. Three (3) forward facing crew cab positions will have intercom / radio listen only capability.

The following components will be supplied with this system:

- One (1) U3815 Radio Interface Module (Driver)
- One (1) U3816 Dual Radio Interface Module (Officer)
- One (1) U3800 Intercom Unit (2 Adjacent Crew)
- One (1) U3801 Remote Headset Station (1 Crew)
- One (1) C3820 Power Cable
- All station interconnect wiring

RADIO INTERFACE NOT REQUIRED
The apparatus manufacturer will not provide a radio/intercom interface.

UNDER THE HELMET HEADSET
There will be five (5) under the helmet, headset(s) provided all locations.

Each David Clark, Model H3442, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress
- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction

HEADSET HANGERS
There will be five (5) headset hanger(s) installed Match mounting locations of 24023. The hanger(s) will meet NFPA 1901, Section 14.1.11, requirement for equipment mounting.

INTERCOM POWER ROUTING

The intercom DC power is to be routed to the PS crewcab wall under shelf.

COMPLETE MDT INSTALLATION
There will be one (1) customer supplied Mobile Data Terminal (MDT), Docking station, Mounting bracket, power supply, antenna, GPS, modem, and all cabling sent to the apparatus manufacturers preferred installer to be installed on the dash in front of the officer. Specific shipping requirements will be followed.

TWO WAY RADIO INSTALLATION
There will be two (2) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed to match 25024 per the shipping document.

No antenna mount or whip will be included in this option.

Specific radio shipping requirements will be followed.

MOBILE RADIO MODEM INSTALLATION
There will be one (1) customer supplied Motorola VRM-850 two way radio modem(s) sent to the apparatus manufacturers preferred installer to be installed to match 25024. Specific shipping requirements will be followed.

GPS ANTENNA INSTALLATION
There will be one (1) customer supplied GPS antenna(s) sent to the apparatus manufacturers preferred installer to be installed on the roof. The antenna coax cable(s) will be run from the antenna to on the roof and a connector provided, if necessary. Specific shipping requirements will be followed.

PORTABLE RADIO CHARGER INSTALLATION

There will be four (4) customer supplied portable two-way radio chargers(s) sent to the apparatus manufacturers preferred radio installer to be installed to match 25024. Specific shipping requirements will be followed.

TWO WAY RADIO SPEAKER INSTALLATION

There will be two (2) customer supplied two way radio speakers sent to the apparatus manufacturers preferred third party installer to be installed on the ceiling one each side.

Specific shipping requirements will be followed.

RADIO ANTENNA MOUNT

There will be two (2) standard antenna-mounting base(s), 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 seat and the additional mount(s) will be located one on the driver's side and one on the passenger's side. The cable(s) will be routed to the passenger side wall of the crewcab under shelf .

KNOX-BOX®

There will be a Knox-Box KeySecure 1, Model 2611, with key pad access. It will have a blue strobe light to warn when the master key is in an unsecured position. The box will be surface mounted and installed on the center of the cab dash, within the cab.

ELECTRICAL POWER CONTROL SYSTEM

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

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

COMMAND ZONE CONTROL SYSTEM

A solidstate electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

Green LED indicator light for module power

Red LED indicator light for network communication stability status

Control system self test at activation and continually throughout vehicle operation

No moving parts due to transistor logic

Software logic control for NFPA mandated safety interlocks and indicators

Integrated electrical system load management without additional components

Integrated electrical load sequencing system without additional components

Customized control software to the vehicle's configuration

Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters

Complete operating and troubleshooting manuals

USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the Command Zone control system modules will meet the following specifications:

Module circuit board will meet SAE J771 specifications

Operating temperature from -40C to +70C

Storage temperature from -40C to +70C

Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

The on-board information center will include the following diagnostic information:

Text description of active warning or caution alarms

Simplified warning indicators

Amber caution light with intermittent alarm

Red warning light with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with an IBM compatible computer.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

VOLTAGE MONITOR SYSTEM

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs will consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The Command Zone control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

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

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

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

ELECTRICAL HARNESSING INSTALLATION

All 12-volt wiring and harnessing installed by the apparatus manufacturer will conform to specification PM-QA W-101: Pierce manufacturing Wiring Harness Specification.

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

SAE J1128 - Low tension primary cable

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

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

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

NFPA 1901 - Standard for automotive fire apparatus

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

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

Wiring will be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. 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. 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

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.

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.

BATTERY SYSTEM

Five-(5) Optima 1000M 12 volt, 800 CCA, 110 min reserve capacity, batteries with a system rating of 4000 CCA at 0 degrees Fahrenheit and 550 minutes of reserve capacity.The batteries shall be provided with SAE posts.

ISOLATED BATTERY

One (1)-12 volt, Optima 1000M battery shall be provided for voltage sensitive components. A battery isolator that is appropriately suited for the battery capacity shall 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 Guest, Model 2304A, master battery switch, to activate the battery system, will be provided to the right side of the steering column on a special bracket.

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 0.188" 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.

The compartments will include formed fit heavy duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

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.

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/ AIR COMPRESSOR

A Kussmaul Pump Plus 1200, Model 091-9-1200, single output battery charger/air compressor system will be provided. A display bar graph indicating the state of charge will be included.

The automatic charger will maintain one (1) set of batteries with a maximum output current of 40 amps.

The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

The air compressor will be plumbed to the rear reserve air tank.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

Battery charger/compressor will be in compartment D2.

The battery charger indicator will be diplayed through the window behind the driver seat. The display will be mounted on a bracket so that it is visible from outside the apparatus in the front lower corner of the window.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul™, Model 091-55-20-120, 20 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include red weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

ALTERNATOR

A Leece-Neville, Model 4962PA, alternator will be provided. It will have a rated output current of 320 amps, as measured by SAE method J56. The alternator will feature an integral, self diagnostic regulator and rectifier. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

SEALED CHASSIS HARNESS END CONNECTORS

All end connecters that are not used and exposed to the elements will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
    - If enabled:
        - "Load Man Hi-Idle On" will display on the information center.
        - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
    - ON = not shed
    - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS
There will be four (4) JW Speaker®, rectangular LED lights mounted in the front quad style, chrome housing on each side of the cab grille:

- The outside light on each side will contain a Model 8800-12V - DOT/ECE LB LED, low beam module.
- The inside light on each side will contain a Model 8800 -12V - DOT/ECE HB LED, high beam module.

DIRECTIONAL LIGHTS
There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

CAB CLEARANCE/MARKER/ID LIGHTS
There will be five (5) Truck-Lite amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) Truck-Lite, Model 19036Y, amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) Truck-Lite, Model 10006Y kit, amber LED beehive clearance/marker lights will be installed, one (1) on each outboard side of the cab roof, above the windshield.

FRONT CAB SIDE CLEARANCE/MARKER LIGHTS
There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as clearance/marker lights with the headlight switch and directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING
There will be three (3) LED identification lights located at the rear installed per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical

- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

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, located each side rear corner. 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 and when the respective directional lights are activated.

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

The lights shall be mounted in a polished combination housing.

Two (2) Whelen Model 60C00WCR LED backup lights shall 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.

REAR STEP BUZZER
A buzzer button compartment will be installed at the rear of the body, in the driver's side aerial access steps. The rear step control will be a button installed into a handle control with a ten (10) foot length of coil cord and housed in a separate compartment with a latched, treadplate aluminum door. The compartment will be mounted in the lower step position when the steps are stored.

WARNING LIGHT FLASH PATTERN
The flash pattern of all the exterior warning lights will be set to meet the certified California, Title XIII flash pattern by either the light manufacturer's default flash pattern or by a conversion change to the certified flash pattern.

LIGHT, INTERMEDIATE
There will be one (1) pair, of Truck-Lite, Model: 30080Y flange mounted amber LED light kits will be furnished, one (1) each side of the rear fender panel, in place of the standard directional/marker intermediate light. The light will double as a turn signal and marker light.

This installation will include a stainless steel cover.

SPECIAL PROGRAMING OF LIGHTS
Battery on, ignition on or off, brake on, marker or headlights off;

No perimeter/ground/step lights on unless the corresponding door or compartment door is opened;

Then only specific lighting in the area of the open door;

The rear tailboard 45 degree lights will come on with the R1 compartment door. The PS 45 dgree light will come on with the P1 compartment door. The DS 45 degree light will come on with the D1 compartment door.

Battery on, ignition on or off, brake on, and marker or headlights on ;

All ground/step lights on;

License plate light is to be treated as a step light when appropriate conditions are met;

Pump panel lights switchable on/off with headlights on and parking brake released. A parking brake interlock will not be provided for the pump panel lights.

CAB PERIMETER SCENE LIGHTS
There will be four (4) Truck-lite, Model 44308C, 4.00" white LED lights with Model 40700 grommets provided, one (1) for the cab and 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 four (4) weatherproof lights provided on the apparatus.

There will be two (3) Truck-Lite, Model 44308C LED lights provided on the apparatus and mounted in the following locations:

- One (1) light will be provided under the left rear step area shining to the rear.
- One (1) light will be provided under the right rear step area shining to the rear.
- One (1) light will be provided under the right pump panel running board.

There will be one (1) Amdor LumaBar H2O, Model AY-9500-020, 20.00" white 12 volt DC LED strip light provided to illuminate the ground area for the pump operator's platform pull out step.

The perimeter scene lights will be activated by a cab door switch and at the pump panel.

STEP LIGHTS NOT REQUIRED
Step lights not required on front compartment bulkheads no pump.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

SIDE SCENE LIGHTS
There will be one (1) pair of Zico, Model ZQL-SS-H7614, scene lights installed in front of the rear tandems facing rear ward Label the switch "Backing Lights".

The lights will be controlled by a control from the driver side switch panel.

12 VOLT LIGHTING
There will be two (2) Whelen Model PFP2, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA203 located on the upper part of the cord reel boxes.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the driver's side switch panel

These light(s) may be load managed when the parking brake is set

12 VOLT LIGHTING
There will be two (2) Whelen Model PFP1, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA103 located one each side rear of body.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the following:

a switch at the driver's side switch panel

a switch at the rear of apparatus on the driver's side

These light(s) may be load managed when the parking brake is set

DOOR SWITCHES

There will be four (4) momentary switches installed in the overhead switch panel.

- Two (2) switches, one labeled "FRONT DOOR" and the other labeled "REAR DOOR" on the driver side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.
- Two (2) switches one labeled "FRONT DOOR" and the other labeled "REAR DOOR"on the officer side switch panel activated with the ignition switch and powered by an 8 amp circuit breaker.

Two power output wires and two ground wires will be supplied to the junction box.

The output wires will be terminated in one (1) 9.45" x 6.30" x 3.54" polycarbonate junction box painted job color installed on the roof at the splice box located on the cab roof.

WATER TANK

It will have a capacity of 500 gallons and will be constructed of polypropylene plastic in a rectangular shape.

The joints and seams will be nitrogen welded inside and out.

The tank will be baffled in accordance with NFPA Bulletin 1901 requirements.

The baffles will have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments.

The longitudinal partitions will be constructed of .38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding.

The transverse partitions extend from 4" off the bottom to the underside of the top cover.

All partitions interlock and will be welded to the tank bottom and sides.

The tank top will be constructed of .50" polypropylene.

It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

It will be supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions.

Two of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump will be provided at the bottom of the water tank. The sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated "cradle" assembly constructed of structural steel.

Sufficient crossmembers are provided to properly support bottom of tank.

Crossmembers are constructed of steel bar chsnnel or rectangular tubing.

Tank "floats" in cradle to avoid torsional stress caused by chassis frame flexing.

Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops are provided to prevent an empty tank from bouncing excessively while moving vehicle.

Tank mounting system is approved by the manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

The water tank fill dome overflow pipe will be shortened by 6.00" from the standard UPF construction dimension.

HOSE BED

The hose body will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

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

The hose body width will be 68.00" inside.

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

The hose bed will be located ahead of the ladder turntable.

The hose bed will be equipped with one (1) adjustable partition located in the center of the bed.

Hose removal will be via "chutes" at each side of the body under the turntable area whenever compartmentation is not selected in place of the "chute". The hose chutes will be enclosed with a full height smooth aluminum door with a spring hinge at the top of the door.

Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration.

The grating slats will be .50" x 4.50" with spacing between slats for hose ventilation.

Hose capacity will be a minimum of 500' of 2.5".

HOSE BED COVER

A cover will be provided to enclose the portion of the hose bed ahead of the aerial turntable between the standard depth compartment and the water tank. The cover will be constructed of aluminum treadplate.

The cover will have the ability to support 250lb.

The cover will be hinged towards the inside of the hose bed area and provided with D-ring handles and pneumatic stay arms.

TURNTABLE STEPS

Steps to access the turntable from the driver side and passenger side will be provided just behind the compartmentation. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The 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) Whelen, Model 01-066D068-00 round LED step lights with black bezels provided for each set of aerial turntable access steps.

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

COMPARTMENTATION
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.

DRIVER 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. The compartment will be blistered at the top inside corner to accommodate the electric motor of the cord reel.

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 18.00" wide x 23.00" high x 24.25" deep with a door opening of approximately 12.00" wide x 15.75" high" wide. A top-hinged horizontal lift up stainless steel door will be provided with pneumatic cylinders for payout of the cord. The three (3) sides of the door opening will have stainless steel scuffplates.

A cover to allow top access to the reel will be provided in the hatch compartment which will be located above these compartments.

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.

There will be one (1) compartment, below the turntable, with a roll-up door. The compartment will be approximately 39.38" wide x 18.38" high x 21.25" deep with a door opening of approximately 33.75" wide x 10.75" high.

COMPARTMENTATION, PASSENGERS SIDE

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. The compartment may be blistered at the top inside corner to accommodate the electric motor of a cord reel.

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 provided 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. The compartment will have a single pan stainless steel lift up style door. The door will have a flush, pawl type latch and (2) two pneumatic lift assist cylinders for payout of the electrical cord. The bottom edge and two (2) sides of the door opening will have stainless steel scuffplates.

Each compartment will have access to the top of cord reel. A cover for the reel will be provided in a different option for a hatch compartment to be located above.

There will be a notch in the rear wall of the compartment over the rear wheels to allow for a hose chute.

A full height roll-up door compartment, behind the rear wheels, will be 43.75" wide x 49.25" high x 21.25" deep inside the lower 29.75" and 12.00" deep in the upper portion. The clear door opening will be 40.75" wide x 41.62" high.

There will be one (1) compartment, below the turntable, with a roll-up door. The compartment will be 39.38" wide x 18.38" high x 12.00" deep with a door opening of 33.75" wide x 10.75" high.

ROLL-UP DOOR, SIDE COMPARTMENTS

There will be ten (10) compartment doors installed on the side compartments. The doors will be double faced aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by A&A Manufacturing (Gortite).

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

A polished stainless steel lift bar with locking key latches to be provided for each roll-up door. The keys to be Model J236 for all compartment doors. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Doors will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surfaces will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

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.

DOOR GUARD

There will be two (2) 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 D2, P2.

DOOR GUARD

nine (9) compartment doors will include an L-shaped guard designed to protect the bottom and interior side of the roll-up door from damage when in the retracted position and contain any water spray while the door is being opened. The guard will be fabricated from stainless steel and installed all doors except D2,P2.

ELECTRIC DOOR LOCKS

There will be ten (10) door(s) located side body doors equipped with electric locks. The locks will be wired battery direct. The switch for control will be located in the cab. In the event of loss of power, a manual override is available.

DOOR PULL STRAPS

two (2) compartment doors will be provided with 32.00" elastic pull straps secured to the mid length of the side compartment with footmans loop and the rear of the roll-up door D4, P4.

ROLL-UP DOOR TRIM

The exterior of the aluminum trim around the door opening will be painted job color.

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

COMPARTMENT LIGHTING

There will be ten (10) compartments with On Scene Solutions LED compartment light strips. The strips will be centered vertically along each side of the door framing. The compartments with these strip lights will be located all compartment doors.

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

COMPARTMENT LIGHTING, ADDITIONAL

There will be four (4) On Scene Solutions, Model Night Stik LED light(s) provided in the compartment(s) located one each side at the top of D6/P6 at cieling fore and aft and 1 each in D2 and P2 installed just to the rear of the door guards on the ceiling fore /aft.. Each light will be 27.00" in length.

Opening the compartment door(s) will automatically turn the compartment lighting on.

MOUNTING TRACKS

There will be six (6) sets of tracks for mounting shelf(s) in D1.3.4, P1,3,4. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be seven (7) shelves with a capacity of 500 lb provided. The shelf construction will consist of .188" aluminum with 2.00" sides. The shelf will have square corners that are welded. 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 location will be P1, P4, D1 two D4 two added at pick up one each in D3 and P3..

SLIDE-OUT/TILT-DOWN TRAY

There will be one (1) slide-out tray provided.

The capacity rating (in the extended position) will be 215 pounds minimum.

Approximately two-thirds of the tray will slide-out from its stored position and will tilt 30 degrees down from horizontal. The vertical position within the compartment will be adjustable.

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

The tray corners will be welded for strength and rigidity.

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

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

Rubber padded stops will be provided for both the in out tray position.

The tray(s) will be located in match 19168 reference photo P4.

TWO (2) WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted utility slide-out tray(s) provided D6/P6 match 25024. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" thick aluminum for the tray bottom and special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be painted to match compartment interior.

The tray will be 3.00" high x full depth of the transverse compartment x as wide as possible for the compartment.

The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length to either side of the apparatus.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be four (4) floor mounted slide-out tray(s) with 2.00" sides provided D1, P1, P4, P6. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior.

The trays will be designed for maximum compartment width and depth.

There will be two undermount-roller bearing type slides rated at 250lb each provided. The pair of slides will have a safety factor rating 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 50lb 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 the locks will be located at the front of the tray for ease of use with a gloved hand.

HATCH COMPARTMENT STORAGE

There will be two (2) hatch compartment(s) provided above the high side body compartments Drivers and officers side catwalks. Not these compartments shall be painted and be a integral part of the sheet metal of the side body compartments..

The compartment(s) overall inside dimensions will be approximately 120.00" long x 24.00" wide x 11.00" deep. A vertical divider will be provided to divide the compartment into two (2) sections. The forward section will cover and provide access to the cord reel above the front stabilizer. The rearward section on the driver's side will be for stokes storage. The rearward section on the passenger's side will be for general storage.

The driver's side hatch compartment will be sized accordingly for storage of a stokes basket. The size of the stokes basket will be 24.50 " W x 10" H x 86" L.

Each compartment will have two (2) lift-up, bright aluminum hatch style treadplate doors. The doors will have lipped edges with a rubber seal for weather resistance. The doors will be hinged on the inboard side.

The doors over the cord reels will have two (2) flush, pawl type latches and two (2) pneumatic lift assist cylinders.

The doors for each rear compartment section will include the following:

- One (1) chrome grab handle at the far rear outboard corner for opening and closing the compartment.

- Pneumatic struts will be provided at each end of the door to push the door open when extended over center and to hold it shut when retracted.

- A single butterfly latch will be provided at the far rear outboard corner of each door. The clear door opening width will be a minimum of 21.00"

The required lighting necessary to meet NFPA requirements will be provided to illuminate the compartment.

NFPA 1901, 2009 edition, section 15.7.1 states that platforms, steps, or permanently attached access ladders shall be provided so that fire fighters have access to all working and storage areas of the fire apparatus. Per the fire department design of this department, there is not sufficient access on the truck as manufactured, to this compartment. Therefore, the apparatus will be non-NFPA compliant at time of delivery.

BODY TRIM PIECE

Aluminum painted trim will be provided on the horizontal body seam above the compartments in place of the chrome/black moulding.The trim will be made of a material to match the body material as practical.

The trim piece will be installed with VHB tape.

MATTING, COMPARTMENT SHELVING

Turtle Tile compartment matting will be provided in 14 shelves. The locations are, shelf equipped compartments and all trays.

The color of the Turtle Tile will be red.

MATTING, COMPARTMENT FLOOR

Turtle Tile compartment matting will be provided in ten (10) compartments on the compartment floor. The locations are, non shelf equipped compartments and hatch compartments.

The Turtle Tile will be red and the leading edge of the matting will include the beveled edge. The beveled edge will be red .

REMOVABLE FLOOR

There will be two (2) piece(s) removable flooring installed over the cord reels, located with the each side above the cord reels in the upper hatch compartments. hatch compartment(s).Each section of flooring will fabricated from bright aluminum treadplate. The flooring will be fabricated to allow the fire department to store equipment in the hatch compartments, without damaging the cord reels.

Flooring will be made removable to allow servicing of the reels.

AIR BAG TRAY UNDERSIDE OF SHELF

One (1) partition will be bolted in in P6 on the bttom of the transverse tray. Each air bag tray will be 26.75" ID. wide x 2.75"ID high x 22"ID front to back and have a D/A sanded finish.

ZIAMATIC BRACKET MOUNTING BRACKET
One (1) partition will be bolted in PS of the transvers compartment tray to form a tee with the partition per photo.s. Bracket will be 27.25" high x 28.25" wide angled from the top to 12.00" out at the bottom x .188" thick and have a D/A sanded finish. See customer provided sketch and photo's.

BLADE TRAY UNDERSIDE OF SHELF
One (1) partition will be bolted in P1 per photo tray will have a mechanical turn stop and a closed back. Each blade tray will be 15.25" inside diameter wide x 1.625" inside diameter high x 15" front to back interior dimensions. The tray will have a D/A sanded finish.

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

SLIDE OUT TOOL BOARD
one (1) slide out aluminum tool board(s) will be provided.

It will be a minimum of .188" thick with .20" diameter holes in a pegboard pattern with 1.00" centers between holes.

The tool board will be 36" from the bottom of the tray floor.

A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard.

The tool board will be mounted to the floor of theslide out tray using a fixed mount.

installed in D6 to extend through to P6 just short of the SCBA mount.

RUB RAIL
The bottom edge of the side compartments will be trimmed with a bright stainless steel rub rail. The rub rail will be 2.00" high and extend 1.00" away from the body, with slanted ends to provide a pleasing appearance.

These 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.

HARD SUCTION HOSE
Hard suction hose will not be required.

HANDRAILS
One (1) handrail will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

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

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

- One (1) handrail will be provided above the driver's side pump panel only.

AIR PACK STORAGE

A total of two (2) specially designed compartment(s) will be provided and located one (1) on the driver's side and one (1) on the passenger's side centered between the tandem rear wheels. The compartment(s) will be approximately 24.00" wide at the top x 10.00" wide at the bottom with tapered sides. The compartment(s) will be approximately 10.00" high x 26.00" deep.

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 brushed 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 three (3) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the driver side forward of the rear wheels, on the passenger side forward of the rear wheels and on the passenger side rearward of the rear wheels. A brushed 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 one (1) 35', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder(s) provided.

ADDED EXTENSION LADDER

There will be a 40', three (3) section, aluminum, Duo-Safety Series 1525-A extension ladder with poles provided.

EXTENSION LADDERS, AERIAL

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

ROOF LADDER

There shall be one (1) 14' roof, aluminum, Series 775-A, special 16.00" width.

This ladder is non compliant to NFPA 1931, Chapter 4.2.2, "*Standard on Design of and Design Verification Tests for Fire Department Roof Ladders".*

Per Fire Department specification request of this ladder, the apparatus will be non compliant to NFPA 1901 standards at time of contract execution.

ADDED ROOF LADDER
There will be one (1) 20' wall, aluminum, Series 850-A provided.

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

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

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

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

A Gortite roll-up door will be provided at the rear, double faced, aluminum construction, an anodized satin finish and manufactured by A&A Manufacturing (Gortite). 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.

LADDER STORAGE LIGHTING
Two (2) LED lights will be used in place of the standard incandescent light in the torque box ladder storage compartment.

Special ladder storage shall be provided in the torque box to allow the storage of the following ladders:

Two (2) 35' 2-section

Two (2) 28' 2-section

two (2) roof ladders

A drop down door will be installed to keep the pike poles and ladder from contacting the roll-up door.Door will not catch on ladder rungs. See Photos.

DURA-SURF LADDER SLIDES
Black Dura-Surf friction reducing material will be added to the stainless steel slides, on the bottom horizontal surfaces, of the ladder storage rack.

REMOVABLE LADDER STORAGE RACK SECTION

There will be a section of the ladder storage rack that is removable for ease of maintenance. On the right hand side, the rear 85.00" will be removable. To accomplish this, the ladder rack will be designed into two separate sections.

6' PIKE POLE

Two (2) pike poles 6' long RH-6DA Nupla ventilation hook(s) with an aluminum D-grip handle will be provided and located shipped loose.

PIKE POLES - 12FT

There will be two (2) 12 foot Nupla YPD-12 pike pole(s) wih featherlight handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLES

two (2) Eight foot Nupla Pike Pole(s): "Featherlite" handles

PIKE POLE 6 FT

There will be two (2) Nupla 6 foot pike pole(s) with featherlight handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

ADDITIONAL PIKE POLE(S)

There will be one (1) 16 foot Nupla YPD-16 "Featherlight" pike pole(s) with fiberglass handles provided.

LABEL IN CAB

A label, indicating "Fuel Prime After Filter Change Only" will be provided next to the fuel primer switch in the cab.

AERIAL ROTATION OVERRIDE LABELS

There will be two (2) labels for the aerial rotation override. One (1) label will read "CCW ROTATION OVERRIDE" and one (1) label will read "CW ROTATION OVERRIDE". The labels will be located at the override controls.

FIRE PUMP

The fire pump will be a Hale APSH-50, 500 gpm, single (1) stage, midship mounted, centrifugal type.

Pump shall deliver the percentage of rated discharges at the pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.

- 100% of rated capacity at 165 psi net pump pressure.

-70% of rated capacity at 200 psi net pump pressure.

-50% of rated capacity at 250 psi net pump pressure.

Entire pump, both suction and discharge passages, will be hydrostatically tested to a pressure of 500 psi (34.5 bar).

Pump will be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the latest NFPA pamphlet #1901, and will be free from objectionable pulsation and vibration.

Pump body and related parts will be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (2041.2 bar).

The pump will have a precision balanced bronze alloy impeller, splined to the pump shaft with a double seal ring design that eliminates end thrust. Renewable double labyrinth type seal rings cast from solid bronze will be provided.A corrosion-resistant precision-ground, splined impeller shaft will be provided that is compatible with both packing and carbon ceramic mechanical shaft seals.

The pump transmission will have helical gears for quiet operation.

HYDRAULIC DRIVE SYSTEM

The hydraulic drive system will be comprised of a variable displacement piston type hydraulic pump, supplying a fixed displacement piston hydraulic motor. The displacement of the hydraulic pump will be controlled by a hydraulic circuit that uses the input from an electronic fire pump governor. The hydraulic system will have a properly sized Reservior, cooler, filter(s) and accessory components. The components will be mounted in the vehicle body to facilitate routine maintenance operations. The hydraulic drive design will be certified by manufacturer of the primary components as suitable for the intended use and duty cycle.

All components of the drive system will be readily available on the domestic hydraulic market (USA). The hydraulic drive system will be assembled by the apparatus manufacturer using standard mobile hydraulic components.

The PTO will be a 10 bolt SAE type mounted to the PTO opening of the vehicle's Allison transmission. The PTO will be rated for at least 20 percent more torque throughput than the air compressor drive system will demand.

NFPA COMPLIANCY

NFPA 1901, 2009 edition, section 16.2.3.1 states that if the pumping system is rated at 3000 gpm or less, it will be capable of delivering the following: one hundred percent of rated capacity at 150psi, seventy percent of rated capacity at 200 psi and fifty percent of rated capacity at 250 psi.

The configuration this pump is used on will not meet these rated capacities. Per fire department specification and request of this option, this apparatus will be non-compliant to NFPA 1901 standards effective at time of contract execution.

MECHANICAL SEAL ON PUMP

Only one (1) mechanical seal will be required on the suction (inboard) side of the pump. The mechanical seal will be two (2.00) inches in diameter and will be spring loaded, maintenance-free, and self-adjusting.

The mechanical seal construction will be a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat with a Teflon backup seal.

PUMP TRANSMISSION

Pump transmission will be tested at the pump manufacturer's factory. The gearbox drive shaft will be heated treated chromium steel. All gears will be high quality electric furnace chrome nickel steel.

Drive shafts will be a minimum of 1.50" diameter hardened and ground alloy steel. All shafts will be ball bearing supported.

The water pump will be driven by a hot shift PTO will be located on the chassis transmission.

An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. Interlock system will be designed to allow stationary pumping only.

PUMP SHIFT

A pump shift will be provided within easy reach of the driver for engagement of the PTO driven pump. The shift will include the indicator lights as mandated by NFPA. The pump shift control will be illuminated to meet NFPA requirements.

AUXILIARY COOLING SYSTEM

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

INTAKE RELIEF VALVE

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

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

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

Control will be located behind an access door at a side pump panel.

PRESSURE GOVERNOR

A pressure sensing pump governor (PSG) system will be provided.

The pressure governor system will be connected to the hydraulic control circuit of the water pump drive. A pressure transducer will be installed in the water discharge manifold on the pump. The pressure transducer will communicate the water pressure to the pressure governor. The governor will have a dial that indicates the approximate water pressure that will be produced by the water pump. The dial, when operated will set the water pressure delivered by the water pump. Upon the water pressure reaching the desired set point, as monitored by the pump operator, by way of a pressure gauge, at the release of the dial, the pressure governor will monitor the water pressure and manipulate the hydraulic control circuit to maintain the proper water pressure. The governor, by way of the hydraulic control circuit, will increase and decrease the water pump speed to maintain the proper pressure.

A single station governor system will be provided, and will consist of one station at the pump operator's panel.

A programmable pump cavitations protection feature will be provided which will allow the governor to control the upward speed change of the water pump, or will return the hydraulic drive to a low speed idle if the pump can develop no pressure, such as when the water tank empties.

The full range of pump performances will be attainable, once the vehicle drive engine has reached a minimum speed. That minimum speed will be 1,500 rpm. Speeds below the stated speed will result in lowered pressures and volumes, deliverable from the water pump, but no change in the function of controlling pressure rise above the governor set point.

PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer.

PUMP MANUALS

Two (2) pump manuals from the pump manufacturer will be furnished in compact disc format with the apparatus. The manuals will cover pump operation, maintenance, and parts.

PLUMBING

All inlet and outlet plumbing, 3.00" and smaller, will be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. If hose is used, it must have a minimum burst rating of 1,000 psi and be equipped with high pressure couplings. Larger inlets and

outlets will be threaded or welded black iron pipe. Small diameter secondary plumbing such as drain lines will be stainless steel, brass or hose.

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

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

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

VALVES

All ball valves will be Elkhart Unibody series. Seats will be self-adjusting for minimum operating torque and maximum abrasion resistance. The Elkhart valves will have an automatic locking feature to hold the ball in any throttle position at any operating pressure. The valve body design will allow any actuator to be mounted to the body.

RIGHT SIDE INLET

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

Inlet valve location will be outside the pump panel.

ANODE, INLET

A pair of replaceable sacrificial .75" magnesium anodes will be provided in the water pump to protect the pump from corrosion. One (1) will be placed in the inlet side of the pump and the other in the discharge side of the pump.

INLET CONTROL

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

INLET BLEEDER VALVE

A 0.75" ball type bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a handwheel type knob for the control extended to the outside of the panel. The water, that is discharged by the valve, will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with heavy duty piping and an electrically controlled 3.00" full flow inline valve. An open/close switch and a lighted position indicator will be remotely located at the operator's panel. The tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

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

TANK REFILL
A 1.50" combination tank refill and pump re-circulation line will be provided, using an electrically controlled quarter-turn full flow ball valve.

FRONT BUMPER CROSSLAYS
There will be two (2) 1.50" discharge outlets piped to the front of the apparatus and located in the front bumper extension.

The front hose bed will have a hose capacity of 200' of 1.75" double jacket cotton-polyester hose.

The rear hose bed (closest to the cab) will have a hose capacity of 200' of 1.75" double jacket cotton-polyester hose.

The hose beds will run from side to side in the bumper extension. The ends of the beds will be closed to contain the hose. Drain holes will be provided in the bottom of each hose bed.

Plumbing will consist of 2.00" piping and flexible hose with a 2.00" full flow ball valve controlled at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The discharges will terminate with a 1.50" NST with 90 degree swivel. The swivel will be located in the bottom of the hose beds and will swing from side to side.

There will be Class 1 automatic drains provided at all low points in the plumbing.

FRONT CROSSLAY COVER
A bright aluminum treadplate cover will be provided over the full width crosslay(s). The cover will be attached with a stainless steel hinge at the rear.

The cover will be secured with a D-ring latch on each side in the closed position and a pneumatic stay arm on each side will hold the cover in the open position.

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

The caps will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDERS
A .75", quarter turn type, bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves may be used with some outlets where appropriate.

The valves will be located behind the panel with a handwheel type control extended to the outside of the side pump panel. Bleeders will be located in a horizontal line at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

DISCHARGE OUTLET CONTROLS

The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve or an indicator will be provided to show when the valve is closed.

There will be four (4) discharge outlets that have Elkhart UBEC electric valve controllers provided. These outlets will be located crosslays, tank fill, tank to pump. The controller unit will provide position feedback with a 10 LED display that indicates closed to fully open status. The controller will be completely sealed with two (2) button open and close valve position.

FOAM SYSTEM

A foam system will not be required on this apparatus.

PUMP COMPARTMENT

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

It will be 42.25" wide x the height of the cab x 24.50" deep in the lower area and transverse in the top portion of the compartment.

The door opening will be 39.25" wide x 56.38" high.

The transverse portion of the compartment will vary depending on chassis and engine combination.

The transverse portion will require additional modification for the pump mounted between the frame rails.

PUMP PANEL CONFIGURATION

The pump panel configuration will be laid out per the following special instructions pump panel to be installed a a 45 degree in the front corner of compartment D6. Note the layout per Brian Van Daalwyk. 25024MPP..

PUMP OPERATOR'S PLATFORM

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

The front edge and the top surface of the platform will be made of DA finished aluminum with a Morton Cass insert.

The platform will be approximately 13.75" deep when in the stowed position and approximately 22.00" deep when extended. The platform will be 35.00" wide. The platform will lock in the retracted and the extended position.

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

PUMP OPERATOR'S PLATFORM PERIMETER LIGHT

There will be an Amdor LumaBar H2O, Model AY-9500-020, 20.00" white 12 volt DC LED strip light provided to illuminate the ground area.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of brushed stainless steel and mounted at a 45 degree angle in the front corner of the compartment in place of the pump house, to allow easy identification of the gauges and controls and to eliminate glare.

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

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion:

- Class 1 Enfo 4 System: With LED display of the engine oil pressure, engine temperature and engine rpm. A warning alarm will be provided for these items.

- Tachometer: Electric

- Voltmeter

Also provided at the pump panel will be the following:

- Master Pump Drain Control

GAUGES, VACUUM AND PRESSURE

The pump vacuum and pressure gauges will be digital LED manufactured by Class 1.

The gauges will display pressure from 0 to 600 PSI, and intake from minus 30 in Hg to 600 PSI.

The display will incorporate super bright LED digits at least 0.5" high.

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

PRESSURE GAUGES

No pressure gauges are required when using the Elkhart UBEC controllers.

PRESSURE DISPLAY

There will be four (4) Elkhart Unibody model UBEC2 display(s) provided for per panel layout. The pressure display will contain solid state electronics with soft-touch buttons for operation to read pressure, 10 light LED read out, two button open closed valve position capability with red, yellow, and green LED valve position indicator lights. The unit will be in a water resistant brass housing and will come with all required installation cables and harnesses.

WATER LEVEL GAUGE

A Fire Research, Model WLA2000 series electric water level gauge will be provided on the operator's panel, that registers water level by means of 9 LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180 degree of clear viewing.

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

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

AIR HORN SYSTEM

Two (2) Grover 2040 rectangular air horns will be provided and located behind the front bumper. A hole will be provided for each horn. The bell of the horn will not protrude through the bumper face. 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

The air horns 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 air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

AIR HORN SWITCHING

The air horns will be the default from the horn ring when the battery switch is turned on. The electric chassis horns will be secondary.

ELECTRONIC SIREN

A Unitrol, model UTM-1, electronic siren and PA system will be provided. A Unitrol, model UNCT, noise-canceling microphone will be provided with the siren amplifier.

The siren will have the following features:

- Switch types: rocker and toggle.

- Panel lighting: adjustable when dashboard lights are dimmed.

- Horn Ring control: Built-in, automatic polarity compensation.

- Short-circuit protection.

- Internal programming switches: Field-adjustable internal switches permit selection of siren sounds and functions to suit personal preferences or local laws.

- Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound after five (5) seconds.

- Kill: stops siren sound when parking brake is set.

- Lock: - Five (5) second override: siren changes to Yelp or Hetro (from Wail or Hi-Lo) when horn ring or manual switch is pressed once. Siren automatically returns to preset sound on demand when horn ring or manual switch is pressed again.

- Sweep: Siren continuously changes three (3) sounds every six (6) seconds. The sequence is started and stopped on demand by pressing the horn ring or manual switch once.

NFPA 1901, Section 13.9.1.1 requires the siren manufacturer to certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens*.

Per the fire department specification, the siren and siren speaker come from separate manufacturers and a certification is therefore invalid. The apparatus will be non compliant to NFPA 1901 standards at time of contract execution.

Siren head will be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket will be capable of rotating a minimum of 180 degrees.

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.

SPEAKER

There will be two (2) speakers provided. Each speaker will be a Whelen, Model SA314A with SACSTFMP trim, 100-watt, cast aluminum with natural finish. Each speaker will be connected to the siren amplifier.

There will be one (1) speaker recessed in the passenger's side and one (1) speaker recessed in the driver's side of the front bumper.

AUXILIARY MECHANICAL SIREN

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

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be mounted on the front grille, partially recessed. The motor will be mounted behind the front grille and will include a reinforcement plate for mounting.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

A second siren brake switch will be installed on the passenger side.

The siren and traffic contoller will be mounted as close together as practical to optimize the driver's and officer's vision. Reference 19153.

LIGHTBAR (CAB ROOF)

There will be a Whelen Model DISDFDMN lightbar mounted on the cab roof above the cab doors. This lightbar shall be split into two (2) separate 19.125" lightbars, a driver's side lightbar and a passenger's side lightbar. The white lights in both of the lightbars will alternately flash between lightbars.

Each lightbar will include the following in the upper section:

- One (1) front red flashing LED warning light.
- One (1) front corner red flashing LED warning light.
- One (1) rear corner red flashing LED warning light.

Each lightbar will include the following items in the lower section:

- One (1) front red flashing LED warning light.
- One (1) front white flashing LED warning light.
- One (1) front corner white flashing LED warning light.
- One (1) side facing dual LED alley lights.
- One (1) rear corner red flashing LED warning light.

There will be five (5) switches in the cab on the switch panel to control both lightbars:

- One (1) switch to control the warning lights.
- Two (2) switch to control the driver's side alley light.
- Two (2) switch to control the passenger's side alley light.

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

The alley lights man be load managed when the parking brake is set.

TRAFFIC LIGHT CONTROLLER

There will be a GTT, Model 792* strobe Opticom traffic light controller with national standard high priority remote mounted on the front edge of the cab driver side cab roof.

The Opticom traffic light controller will be activated by a cab switch with emergency master control.

The Opticom traffic light controller will have no momentary activation switch.

The Opticom traffic light controller will be disabled when the parking brake is applied.

LIGHTBAR MODIFICATIONS

The steady red LED lights in the quads will be wired to the front warning switch.

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WARNING LIGHTS (CAB FACE)

Two (2) pair of Whelen Model 60RR6FRR red flashing LED lights with red lenses will be installed on the cab face, above the headlights, mounted in a common dual light housing.

There will be a switch located in the cab on the switch panel to control both sets of lights.

The flash pattern for the right side of these lights will flash separately from the left side of these lights.

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

DAYTIME RUNNING LIGHTS (HEADLIGHTS)

The low-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

Eight (8) Whelen flashing LED warning lights with chrome flanges shall be located at the following positions:

Two (2) Model 60RC6FCR red and clear lights with a clear lens , one (1) each side on the bumper extension

The white portion of this light will be to the rear.

Two (2) Model 60RR6FRR red lights with red lens to the rear of the crew cab doors per print.

Four (4) Model 60RR6FRR red lights with red lens 1 on each side stabilizer cover per print.

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

The white light will be disabled when the parking brake is set.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

SIDE WARNING LIGHTS

There will be four (4) Whelen, Model 3S*00F*R LED flashing lights provided.

The lights will be located interior on each door.

The color of the lights will be amber.

The color of the lenses shall be the same color as the LED's.

The lights will be with a Whelen, Model 3FLANGEC surface mount chrome flange.

Each light will be activated by the door jam switch of the associated door.

REAR ZONE LOWER LIGHTING
There will be two (2) Whelen, Model 60RR6FRR, flashing LED warning lights located at the rear of the apparatus.

The color of these lights will be red with a red lens.

There will be a switch, located in the cab on the switch panel to control these lights.

The flash pattern of these lights will be set so the right side of the light flashes separate from the left side.

REAR AND SIDE ZONE UPPER WARNING LIGHTS
There will be six (6) Whelen LED warning lights with Whelen, Model 6EFLANGE, chrome flanges provided.

- Two (2) Model 60RR6FRR, red lights with red lenses will be provided at the rear on the upper rear bulkhead as high and as far apart as practical.
- Two (2) Model 60RR6FRR, red lights with red lenses will be provided at the rear on the upper rear bulkhead under the above lights. The right side of these lights will flash independently of the left side of these lights.
- One (1) Model 60RR6FFR, red lights with red lenses will be provided to the side of the driver's side rear of the apparatus facing the driver's side of the apparatus.
- One (1) Model 60RR5FFR, red lights with red lenses will be provided to the side of the passenger's side rear of the apparatus facing the passenger's side of the apparatus.

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

TRAFFIC DIRECTING LIGHT
There will be one (1) Whelen, Model TAL65, 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

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

The auxiliary warning mode will be activated with the emergency master switch.

This traffic directing light will be mounted on top of the body below the turntable with a treadplate box at the rear of the apparatus.

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

The electronic siren will be located above the traffic directing light control head.

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

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 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 144.00" (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 degree 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 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (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 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (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 30.00" (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 Standard

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 an independent third-party certification organization.

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 AC (alternating current) electrical power system. The generator will be a Harrison, Model 10.0MAS-16R/D-11011/15/1, 10,000 watt hydraulic driven unit.

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

The hydraulic engagement supply will be operational at any time (no interlocks).

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

Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel will be furnished and mounted near the circuit breaker panel.

GENERATOR LOCATION

The generator will be mounted in the match 19168. The flooring in this area will be either reinforced or constructed in such a manner that it will handle the additional weight of the generator.

GENERATOR START

There will be a switch provided on the cab instrument panel to engage the generator.

GENERATOR REMOTE START

There will be one (1) remote start switch provided in the cab switch panel and at the turntable control panel to engage the hydraulic generator PTO and field. A light at each switch location will be provided to indicate that the generator is running.

CIRCUIT BREAKER PANEL

The circuit breaker panel will be located left front of D2 on the inside wall. match 19168.

240 VOLT LIGHTING

The apparatus will be equipped with a through compartment, bottom raise, telescoping flood light The light will be a Fire Research Model FC512-M15 with a Focus lamp head. The lamp head will be 240 volt, 1500 watts, with a 6.3 amp draw and have an output of 35,000 lumens. The lamp head will swivel 360 degrees left or right and tilt up and down.

All wiring used up to the junction box will be a minimum of 14 gauge 3 wire cable that is properly supported and protected from damage.

A total of Two (2) will be provided one each front corner of the transverse compartment. Add bracket to the bottom of the outter light pole to stabilize the light pole..

ELECTRIC CORD REEL

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 72.00" above the operators standing position.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A Nylatron guide to 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 one each side above the front outriggers.

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

CORD

Provided for electric distribution will be two (2) lengths, one (1) for each reel, of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. A Hubbell L5-30, 30 amp, 120 volt, twist lock connector body will be installed on the end of the cord.

PORTABLE JUNCTION BOX

There will be four (4)-120 vac, 15 amp, twist lock receptacles, and a locator/indicator light provided in an outlet box. The junction box construction will be weatherproof and have flip-up covers lined with soft neoprene rubber at each outlet opening. The junction box will be a Circle-D, model PF-51 G.

Color of the junction box will be yellow.

A Hubbell L5-30, 30 amp, 120 volt, twist lock connector body.

A total of two (2) will be provided.

ROLLER GUIDES

A set of three captive rollers will be installed just inside the lift up stainless steel compartment door in the compartment above the front stabilizers on both sides of the appartus. The roller guides will be installed on the inside walls and on the floor of the compartment forming a "U" shape around the compartment interior. The roller guides will not interfere with the stainless steel lift up pan door in the closed position.

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:

- 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 side(s) where the stabilizers have been fully deployed.

The system will also have a manual override to comply with NFPA 1901.

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.

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 #107 Red.

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 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 folding steps will be provided at the tip of the ladder. An additional set of folding steps will be provided at the base of the fly section. The steps will be bright finished, non-skid with a black coating. Each step will incorporate an LED light to illuminate the stepping surface.

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.

HAT MOUNTING BRACKET

Mounting shall be provided near the end of the fly section of the aerial ladder for one (1) Intercom and tip light

The bracket shall be sized to hold a Intercom bracket , Tip light and nozzels on the drivers side of the tip.

TEMPORARY SCABBARD AT END OF AERIAL

There will be a total of one (1) vent saw scabbard(s) provided. The scabbard(s) will be mounted on each side of the aerial tip. The scabbard(s) will be DA finished.

LADDER STORAGE MOUNTING BRACKETS

There will be D/A finished brackets provided near the end of the fly section of the aerial for mounting a roof ladder.

The mounting brackets will accommodate a 14' Duo-Safety 775-A, 16.00" wide roof ladder as determined by the type of aerial device and the available space.

TURNTABLE ROTATION MOTORS COVER W/TREADPLATE

The turntable rotational motor covers will have full treadplate covers to protect from boot scuffs.

INFORMATION CENTER

There will be an information center provided. The information center will operate in temperatures from -40 to 185 degrees Fahrenheit. The information center will employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD will have a minimum 400nits rated, color display. The LCD will be sunlight readable. The LCD display will be encased in an ABS, black plastic housing with a gray decal. There will be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

OPERATION

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

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an amber background color will indicate a caution condition and a red background color will indicate a warning condition.

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

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

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

PAGE SCREENS

The Information center will include the following pages:

The Aerial Main and Load Chart page will indicate the following information:

- Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols.

- Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.

- Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time.

- Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph will flash.

- The Aerial Load Chart will indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable).

- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

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

- Aerial Hydraulic Oil Temperature will be indicated with symbol and text. At a glance features will be utilized.

- Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. At a glance features will be utilized.

- The following calculations will be indicated on a representative vehicle symbol:

- Aerial Device Extension length.

- Aerial Device Height indicating the height of the aerial device tip from the ground.

- Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.

- Aerial Device Angle indicating the angle from the vehicle which the device is at.

- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Level Vehicle page will indicate the following information:

- The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.

- The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.

- Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:

- Outrigger stowed indicated with a silver pan located close to the vehicle

- Outrigger fully extended indicated with a fully deployed green outrigger

- Outrigger short-jacked indicated by a yellow outrigger partially deployed

- Outrigger not set indicated by a red outrigger that is not set on the ground

- A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system. The following status will be indicated in the text box:

- Deployed status will indicate all outriggers are properly set on the ground at full extension

- Shortjacked status will indicate one or more outriggers are set on the ground but not fully extended.

- Not Set status will indicate one or more outriggers is not properly set on the ground.

- Stowed status will indicate all outriggers are stowed for vehicle travel.

- A bedding assist alert will indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick.

- *At A Glance* color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

MENU SCREENS

The following screens will be available through the Menu button:

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

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

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

The Set Startup screen allows setting of the screen that will be active at vehicle power-up.

The Set Date and Time screen has a 12- or 24-hour format, and allows setting of the time and date.

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

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

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

Button functions and button labels may change with each screen.

LOWER CONTROL STATION

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

- Level assist switch

- Override switch to override microprocessor

- Emergency power unit switch

AERIAL DEVICE CONTROL STATION

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

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

TURNTABLE CONTROL STATION

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

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

- Electric controls for elevation, rotation, extension/retraction

- Intercom controls

- Tip tracking light switch

- Emergency power unit switch

- Operator's load chart

TURNTABLE WORK LIGHTS

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

HIGH IDLE

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

STABILIZERS

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

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

The stabilizer control box will include the following:

- One (1) green power indicator light for stabilizer control that will be illuminated when the aerial master and "PTO" switches in the cab are activated.

- Four (4) electric toggle switches for stabilizers: each toggle switch will control the extend/retract and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.

- Auto leveling assist switch: The outrigger control system will incorporate a computerized self leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically level the truck. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.

-One (1) electric toggle switch for the engaging the emergency power unit.

- One (1) red "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.

- Four (4) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.

- Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

Each toggle switch will activate the engine fast idle automatically.

Manual override will be supplied for each stabilizer control valve.

A "Stabilizers Not Stowed" indicator 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.

STABILITY ALARM

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

STABILIZER SCENE LIGHTS

A 4.00" diameter, clear floodlight will be mounted at each stabilizer, to illuminate the surrounding area. The light will activate with the aerial master switch.

STABILIZER PINS

The stabilizer jacks will have holes for the stabilizer pins.

ALUMINUM DOOR, STABILIZER CONTROL BOX

A vertical hinged smooth aluminum door will be provided over each stabilizer control box. The door will be hinged outboard.

FULL WIDTH ACCESS DOOR FOR STABILIZER OVERRIDE VALVE

The rear access door for the stabilizer manual override will be full width between the tow eyes.

STABILIZER SKID PLATE, REAR STABILIZER

A skid plate will be supplied on the rear stabilizer to keep the unit from bottoming out on pavement.

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 105' heavy duty ladder shall utilize a microprocessor-based control system. The system shall consist of the following components:

A tethered stabilizer control shall be provided. The tethered control shall be weatherproof and oil resistant. A Super Bright LED indicator light shall be labeled on a metal photo panel for each function. The electrical connection at the tethered control shall be permanently attached by a strained relieved coil cord that shall allow the operator to move 14ft away from the electrical connection for operation.

- Remote Stabilizer Controls
- Weatherproof and oil resistant
- One (1) green "power" indicator light
- One (1) red "stabilizer not stowed" indicator light
- One (1) electric toggle switch for auto level assist
- One (1) electric toggle switch for the emergency power unit
- One (1) electric toggle switch for each stabilizer to control:
- Extend/retract function
- Raise/lower function
- One (1) green "stabilizer fully extended" indicator light for each stabilizer
- One (1) green "firm on ground" indicator light for each stabilizer

Control System Modules

Each of the control system modules shall be configured as follows:

- Sealed to a NEMA 4 rating
- Operating range from -40 degrees F to 185 degrees F (-40 degrees C to 85 degrees C)
- Communicate using J1939 data link
- Two (2) diagnostic LED light
- One (1) green light that illuminates when module has power (B+) and ground
- One (1) red light that flashes to indicate the module is capable of communicating via the data link
- Ground matrix identification system

The following control system modules shall be used:

Control Module

- Main controller for the system
- RS232 connection allows for computer diagnostics

Power Module

- Built-in fault sensing
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 15A continuous per output
- Circuit protection based on actual current draw (not affected by heat)

Constant Current Module

- Built-in fault sensing
- Four (4) analog inputs
- Eight (8) digital outputs
- Pulse width modulating (PWM) capable
- 4A continuous per output
- Circuit protection based on actual current draw (not affected by heat)

Input Module

- 16 software selectable (digital or analog) inputs

Output Module

- 16 digital outputs

Input/Output Module

- Eight (8) software selectable (digital or analog) inputs
- Eight (8) digital outputs

SPOTLIGHTS

There will be four (4) Unity, Model AG-S-P46SLC, white,12 volt DC LED spotlights furnished.

- One (1) will be mounted on the driver's side of the base section of the ladder.
- One (1) will be mounted on the passenger's side of the base section of the ladder.
- One (1) will be mounted on the driver's side tip of the ladder.
- One (1) will be mounted on the passenger's side tip of the ladder.

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

NFPA 1901, 2009 edition, section 19.18.6 A spotlight of not less than 75,000 beam cp (75,000 lumen per steradian) or a floodlight on not less than 10,500 lumens shall be provided on the apparatus by

which the operator shall be able to observe the effect of the stream from the ladder pipe or monitor nozzle.

The lights at the tip have less than 10,500 lumen output. Per fire department specifications and request of these lights, this apparatus shall be non-compliant to NFPA 1901 standards effective at time of contract execution.

AERIAL LOCATOR LIGHT, STROBE

There will be two (2) Whelen Model RSB02ZCR blue 12 volt flashing LED lights installed at the aerial tip facing out when the aerial boom is in the stowed position. There will be one (1) light on the driver's side and one (1) light on the passenger's side. The light will be activated when the aerial device is lifted from the cradle.

STABILIZER WARNING LIGHTS

There will be four (4) Whelen®, Model 60*02F*R, LED flashing warning lights with Whelen, Model 6EFLANGE, chrome flanges installed, one (1) on each stabilizer cover panel.

- The front stabilizer pan lights will be red Super LED/red lens each side
- The rear stabilizer pan lights will be red Super LED/red lens each side

These lights will be provided with a flange.

These warning lights will be activated by the same switch as the side warning lights.

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.

120 VOLT LIGHTING, TIP OF LADDER

One (1), Fire Research Corp, S75, 750 watt, 120 volt light(s), will be provided at the tip of the ladder. The light(s) will be located on the driver side only.

The lights will be mounted on brackets to keep the tip of the ladder as narrow as possible. The quartz lights will on top of the bracket with the Collins light on the bottom side of the bracket.

Light(s) will be 120 volts.

Light(s) shall be labeled "120V Tip Light" and have and on/off indicator light and be switched at the lighthead and turntable

2-WAY AERIAL COMMUNICATION SYSTEM

There will be a Fire Research model ICA900-112 two-way intercom system provided. The control module will be located on the turntable operator console, provided there is room, and have 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 control module push-to-talk button is pressed.

Each intercom unit will be weatherproof.

RAISED AERIAL PEDESTAL

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

RESCUE LIFTING SYSTEM

A rescue lifting attachment will be provided. The lifting attachment will mount to the aerial egress and will consist of a pair of nylatron pulleys mounted to a stainless steel shaft. The pulleys will be adjustable from side to side and will have a total lifting capacity of 500 pounds, regardless of whether one (1) or both pulleys are being utilized.

ROPE TIE BAR AT BASE SECTION, RESCUE LIFTING SYSTEM

A removable bracket shall be supplied at the rear of the base section, attached between the left hand and right hand rear hand rails. The bracket shall provide Lyfe Pulley rope tie off and/or guide points spaced 5.75" apart, centered between the rear hand rails. The bracket shall be designed to be easily removable and not interfere with a fully retracted ladder assembly when attached to the base section. A storage box for the bracket shall be provided on the outside rear of the base section.

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.

SPECIAL COLOR, BOOM SUPPORT

The boom support will be painted job color.

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 ECCO Model 6200 amber strobe lights provided at each side of the tip of the base section of the aerial device.

STABILIZER SCENE LIGHTS

There will be one (1) Truck-Lite, Model 44308C 4.00" LED, scene light installed on each stabilizer to illuminate the surrounding area. These lights will be installed in place of the standard lights. A total of four (4) lights will be installed.

The stabilizer lights will be switched to turn on with the body perimeter lights or the aerial master switch.

INCLINOMETER
One additional inclinometer will be provided to indicate the degree of elevation of the truck.

This inclinometer will be located on the opposite side of the standard inclinometer.

CHAIN, AERIAL TURNTABLE
A chain 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
An Akron, model 3578 monitor with stow and deploy will be provided at the tip with a Akron 1250 gpm Model 1577.

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.

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 4.00" NST inlet to the aerial waterway will be provided at the rear of the apparatus. It will be furnished with a 5.00" FNPT x 4.00" FNST swivel chrome plated adapter with a chrome plug and chain. There will also be a single 2.50" outlet located at the rear adjacent to the 4.00" inlet. The 2.50" outlet will be furnished with a 2.50" ball valve and will terminate with a 2.50" MNST with a chrome cap. A 1.5" 1/4 turn ball valve will be supplied for a drain at the rear of the plumbing.

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.

2.50" AUXILIARY OUTLET AT AERIAL TIP

An auxiliary hose connection outlet will be supplied at the tip of the aerial ladder. It will be located on the left hand side of the aerial waterway.

Flow to the auxiliary outlet will be supplied by 2.50" piping. A 2.50" gate valve with a non-rising stem and crank handle will be supplied. A cap and chain will be provided.

Flow to the aerial waterway monitor will be controlled by a 4.00" aluminum butterfly valve with a non-rising stem and crank handle. The valve will be located at the monitor inlet.

A 200 psi relief valve and a .75" automatic drain valve will be supplied in the waterway at the tip.

STACKED TIPS AT AERIAL TIP

A set of Elkhart ST-194 stacked tips will be mounted at the aerial tip. The tips will be mounted with a 3.50" chrome screw plate.An Akron #337 adapter, 3.50" x 2.50", will be provided.

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.

QUICK LOCK WATERWAY INDICATOR LIGHT

An LED indicator lights and audible alarm will be located on the turntable control console to indicate when the quick lock waterway is latched in the operating position with indicator light and unlatched in the other position with indicator light.

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.

SAFETY VIDEO(S), ADDITIONAL

one (1) additional apparatus safety video, in DVD format will be provided. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus. Safety procedures for the following will be included: vehicle pre-trip inspection, chassis operation, pump operation, and maintenance.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the

LOOSE EQUIPMENT PROVIDED WITH APPARATUS

D3000	1	Dyna	Generator, Portable, 3000 watt
392200462010	1	AMKUS	Tool, Rescue, Chain Package
70120G512050	1	AMKUS	Tool, Rescue, (GH2S2-XL) Power Unit
220200001000	1	AMKUS	Tool, Rescue, HD Cutter, AMK-22
100004751700	1	AMKUS	Tool, Rescue, Ram Extension, 10'
110200372000	1	AMKUS	Tool, Rescue, Ram, AMK-20R, 20"
110200374000	1	AMKUS	Tool, Rescue, Ram, AMK-40R, 40"
110200376000	1	AMKUS	Tool, Rescue, Ram, AMK-60R, 60"
300204461000	1	AMKUS	Tool, Rescue, Spreader, AMK-30CX
2.5 NHF x 2.5 NHF	1	REDHEAD	Adapter, 2.5" double female (Style 35)
4 NHM x 4 NHM	1	REDHEAD	Adapter, 4" double male (Style 36)
017106	1	PARATECH	Axe, Pry, Crash Axe
SKU 24180	1		Bar, Hooligan, Leather Head Tools
531	4	Gemtor	Belt, Ladder Man's
240	1	Amerex	Extinguisher, Fire, Water, 2.5 Gallon
EFC-50	1	RAMFAN	Fan, Ventilation, Electric
GF-165	2	RAMFAN	Fan, Ventilation, Gas

TS 420	1	STIHL	Saw, Rescue
MS 461	2	STIHL	Saw, Chain
616	1	Council Tools	Axe, Flat Headed 32" curved handle
180PP	2	Council Tools	Bar, Pry, Pinch Point Crowbar
404WNB	2		Come-Along, Little Mule
12350WB50L515W	4		Cord, Electrical, 50' (NEMA L5-15)
4006	2		Cutter, Seatbelt Quick-cut rescue tool
1675-6	1	MILWAUKEE	Drill, "Hole-Hawg", 1/2"
PR1000FG	1	Council Tools	Hammer, Sledge, 10 pound
RH-6DA	2	NUPLA	Hook, Roof, 6'
P7406	1	Werner	Ladder, 6', "A" Frame
KPI-22	1	PARATECH	Air Bag, Maxiforce, 22"
	2	REDHEAD	Spanner, 4" Hose (Style 101)
JSA-200	1	JUNKIN	Stretcher, Plastic, Litter Basket
JSA-300	1	JUNKIN	Stretcher, Wire, Litter Basket
SV970200	1	SURVIVAIR	Vacuum, Wet, "Salvage Master"
331	1	Amerex	Extinguisher, Fire, CO2, 15 lbs 10.B.C.
L1312	4	Designers Edge	Floodlights
SKU 177119	1	REDHEAD	Wrench, Hydrant
2535600	2	Ames	Shovel, Round nosed
2672300	2	Ames	Shovel, Scoop
2535700	2	Ames	Shovel, Square nosed
	1	Scott	Bag, RIC, (Rit-Pak III)

10097247	1	MSA	Camera, Thermal Imaging, Evolution 5200
200332-58	4	SCOTT	SCBA, Air-Pak 4500 psig, NxG2
M3536A	1	Phillips	Heartstart monitor
103-14A	1	Desert Diamond	Blades, Rescue Saw, 1 set
	1	MILWAUKEE	Sawzall, Corded, (Super Sawzall Electric)
	2	MILWAUKEE	Sawzall, Batteries (28v Battery)
	1	MILWAUKEE	Sawzall, Blades, Metal (5788 18tpi), Wood (5035 5tpi)
CTC-6002	1		Rescue 42 Struts Truck Kit
EZ-L5-15P	4		Plug Accessories, NEMA Twist lock
KPI 17	1	PARATEC	Airbag, 17" Maxiforce
KPI 12	1	PARATEC	Airbag, 12" Maxiforce
	1	PARATEC	Airbag, Regulator, Maxiforce (Control package G2)
60P36C	4	Council Tool	Axe, Pickheaded
	1		K Tool Kit
12127	4		Axe, Scabbard
	1		ResQDisc, Save A Life Disc
9CUKO	1		Air Chisel, Ajax Rescue Kit
04616	2		Ratchet Straps 2", Keeper 2" Ratchet
	1		T.I.C. Spare Battery, MSA Rechargeable Lithium Ion Battery Pack
10107602	1	Altair	4x Multi Gas
BUP337	1	Bushnell	Binoculars, Bushnell 7X50mm
PMMN4045B	4	Motorola	800 MGZ Collar Mic
200388-01	2	Scott	Tool Adapter

304564-01	4	Scott	Amplifier, Voice Amps
DC68GOS	2		Debris Carrier 6X8
EM810	1	3D Equipment	Decontamination Shower
1VEH8	1	Speedaire Compressor	Air Chuck Coil
ATAHCWG-T	1	Source	Dual Angle Tire Inflator
PF175X50YEN	8		Hose, 1-3/4", 50'
PF25X50YEN	10		Hose, 2-1/2", 50'
1737	2		Nozzle, Turbojet, 200 SOM Select O Flow
2129	2		Shut Off Butt, 1-1/2"
0536	1		Nozzle, 1-1/2" Cellar
APX 5000	1	Motorola	Radio, Mobile, 800 Mhz remote head
TK-790	1	Kenwood	Radio, Mobile, VHF remote head
XTS 5000	4	Motorola	Chargers, Portable Radio
CF31	1	Panasonic	Docking station for mobile data computer #CF-WEB301M
CF-LNDDC120	1	LIND	Power Supply
	1		GPS Logix Modem L5500 cellular router with 2 antennas

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition, section 9.8.2 and 9.8.3 will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- 800 ft (240 m) of 2.50" (65 mm) or larger fire hose, in any combination.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose, in any combination.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) playpipe with shutoff and 1.00" (25 mm), 1.125" (29 mm), and 1.25" (32 mm) tips.
- One (1) SCBA complying with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) salvage covers, each a minimum size of 12 ft × 14 ft (3.6 m × 5.5 m).
- Four (4) combination spanner wrenches mounted in brackets fastened to the apparatus.
- Two (2) hydrant wrenches mounted in brackets fastened to the apparatus.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.

- One (1) rubber mallet, for use on suction hose connections, mounted in a bracket fastened to the apparatus.
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*.
- One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components.*
- One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983*, Standard on Fire Service Life Safety Rope and System Components.*
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 9.7.2 requires a minimum of 20 ft of suction hose or 15 ft of supply hose.

Hose is not on the apparatus as manufactured. The fire department will provide suction or supply hose.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 9.8.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 9.8.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

AXE, FLATHEAD, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, Section 9.8.3 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

AXE, PICKHEAD, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, Section 9.8.3 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

WIRING SCHEMATIC

One (1) laminated 34" x 44" drawing of the detailed wiring schematic will be provided for the 120/240-volt electrical system.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom body will be thoroughly cleaned and prepared for painting. Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface will be removed or filled and then sanded smooth for a smooth appearance. All seams will be sealed before painting.

2. Chemical Cleaning and Treatment - The aluminum surfaces will be properly cleaned using a four (4)-phase, high pressure and high temperature acid etching system. All steel surfaces will be properly treated using a three (3)-phase, high temperature, cleaning/phosphatizing system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse of 25 parts per million solids or less, will be applied to final rinse all metal surfaces at the conclusion of the metal treatment process. This final rinse ensures all chemical residues are removed and that no minerals, (salts), from the water dry onto the metal surface and remain under the primers and topcoats. These salts can lead to blistering and under film corrosion.

3. Primer/Surfacer Coats - A minimum of two (2) mil dry, (.002), of two component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong

corrosion protective base coat and to smooth out the surface. The primer is a high solids and low VOC paint.

4. Hand Sanding to Ultra Fine Finish - The primer/surfacer coat is lightly sanded with mild abrasive paper to an ultra smooth finish. This hand finish process is critical to produce the smooth mirror like finish in the topcoat.

5. Sealer Primer Coat - A two (2) component sealer primer coat is applied over the sanded primer to again build toward the final smooth finish. This layer of primer sealer also gives additional corrosion protection.

6. Topcoat Paint - Two (2) coats of an automotive grade, two component acrylic urethane paint are applied to provide the lasting beauty and durability. The acrylic urethane topcoat contains a clear coat resin chemistry that creates the high gloss and depth of image. This type of topcoat provides the best resistance against acid rain and other more common chemicals.

7. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied. Lap style doors will be clear coated to match the body. Roll-up doors will not be clear coated and the standard roll-up door warranty will apply.

A cyclic corrosion test, (General Motors test GM-9540), of 40 cycles will be required before making changes to the exterior coating process. Exterior coating systems, (excluding the undercarriage components), must achieve a 1/16 or less maximum creep from the scribe for aluminum and an 1/8 or less maximum creep from the scribe for galvanneal after 40 cycles in the General Motors GM-9540 test.

Each batch of color topcoat, together with the finish painted vehicle, is tested for precise color match. Visual color match will be checked following ASTM D-1729, (American Standard Testing Methods), procedures using CIE, (International Commission on Illumination), D75 Northern Daylight light source. Instrumental color match will follow ASMT D-2244 procedures with a maximum delta E of 1.0 for whites, 1.4 for yellows, blues, greens and 1.5 for reds.

All removable items such as brackets, compartment doors, door hinges, trim, etc. will be removed and painted separately to insure paint behind all mounted items. Body assemblies that can not be finish painted after assembly will be finish painted before assembly.

The cab and the body will be painted #107 RED .

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous body items, an isolation tape or gasket material will be used to prevent damage to the finish painted surfaces. A nylon washer will be installed under each acorn nut or metal screw that is fastened directly to a painted body surface.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State (his) regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

Topcoats and primers will be chrome and lead free.

Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.

Particulate emission collection from sanding operations must have a 99.99 percent efficiency factor.

Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.

Water from water wash booths will be reused. Solids will be removed mechanically on a continual basis to keep the water clean.

Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.

Empty metal paint containers will be cleaned, crushed and recycled to recover the metal.

Solvents used in clean-up operations will be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation will be used as fuel in off-site cement kilns.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be painted 107 before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be painted are:

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Fuel tank

- Castings
- Individual piece parts used in chassis and body assembly

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

The E-coat process will meet the technical properties shown.

PAINTED AIR CONDITIONING COVER AND MOUNTS

The cover of the air conditioning condenser and the mounting feet will be painted to match the color of the cab roof.

COMPARTMENT INTERIOR PAINT

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

AERIAL DEVICE PAINT COLOR

The aerial device paint procedure will consist of a six (6) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point will be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.

2. Primer/Surfacer Coats - A two (2) component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. All seams will be caulked before painting.

3. Hand Sanding - The primer/surfacer coat will be lightly sanded to an ultra smooth finish.

4. Sealer Primer Coat - A two (2) component sealer primer coat will be applied over the sanded primer.

5. Topcoat Paint - Urethane base coat will be applied to opacity for correct color matching.

6. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied.

Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. will be supplied as received from the vendor.

Removable items such as brackets will be removed and painted separately to ensure paint coverage behind all mounted items.

The aerial device (turntable and ladder sections) will be painted white 10 using the six (6) step finishing process.

The support structure, rotation motor, components below the rotation point and the stabilizers will be cleaned, caulked, primed and painted high gloss black.

The tip of the ladder willl be painted a contrasting color for high visibility.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

The reflective vinyl band will be provided across the front bumper.

CHEVRON STRIPING, REAR

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors and the rear bumper will not be covered.

The colors will be ruby red and lemon yellow reflective.

Each stripe will be 6.00" in width.

This will meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface will be covered with chevron striping.

REFLECTIVE STRIPE ON STABILIZERS, IPOS

There will be 4.00" wide alternating lemon yellow and ruby red reflective chevron stripes provided on the forward and rear facing sides of all four (4) aerial stabilizers. The stripes will be angled at a 45 degree angle.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

REFLECTIVE STRIPE, CAB DOORS

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

LETTERING

The lettering will be totally encapsulated between two (2) layers of clear vinyl.

LETTERING

Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, with outline and double shade will be provided.

LETTERING

There will be reflective lettering, 2.00" high, with no outline or shade provided. There will be eight (8) letters provided.

LETTERING
There will be genuine gold leaf lettering, 12.00" high, with outline and double shade provided. There will be 32 letters provided.

LETTERING
There will be reflective lettering, 9.00" high, with no outline or shade provided. There will be six (6) letters provided.

LETTERING
There will be reflective lettering, 5.00" high, with no outline or shade provided. There will be three (3) letters provided.

LETTERING
There will be reflective lettering, 14.00" high, with no outline or shade provided. There will be two (2) letters provided.

DECAL INSTALLATION
There will be one (1) pair of decals furnished by the fire department and applied by the apparatus manufacturer.

EMBLEMS
An American flag emblem, 4.00" high x 7.00" wide, will be installed between the front doors and the crewcab window,the of the flag is to level with the top of the window. The flag will appear to be moving in the wind.

MALTESE CROSS INSTALLATION
There will be one (1) pair of maltese crosses, comprised of genuine gold leaf material, provided and installed cab doors.

MANUAL, FIRE APPARATUS PARTS
One (1) custom parts manual for the complete fire apparatus will be provided in hard copy with the first of the four (4) completed units.

One (1) compact disc (CD) will also be provided with the first of the four (4) completed units that will include all of the information from the above manual.

The manual will contain the following:

- Job number

- Part numbers with full descriptions

- Table of contents

- Parts section sorted in functional groups reflecting a major system, component, or assembly

- Parts section sorted in Alphabetical order

- Instructions on how to locate parts

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

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the factory website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

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

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

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY
A Detroit Diesel **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

STEERING GEAR WARRANTY
A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY
The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor Wabco™ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP
The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

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TRANSMISSION WARRANTY
The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

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

WATER TANK WARRANTY
A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY
A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

PUMP WARRANTY
A Hale pump limited warranty certificate, WA0248, is included with this proposal.

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TEN (10) YEAR PUMP PLUMBING WARRANTY
The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY
The Pierce device limited warranty certificate, WA0052, is included with this proposal.

AERIAL SWIVEL WARRANTY
An Amity five (5) year limited swivel warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

HYDRAULIC SYSTEM COMPONENTS WARRANTY
Aerial hydraulic system components will be provided with a five (5) year material and workmanship limited warranty.

HYDRAULIC SEAL WARRANTY
Aerial hydraulic seals will be provided with a three (3) year material and workmanship limited warranty.

A copy of the warranty certificates will be submitted with the bid package.

AERIAL WATERWAY WARRANTY
An Amity ten (10) year limited waterway warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FOUR (4) YEAR PRO-RATED PAINT AND CORROSION
A Pierce aerial device limited pro-rated paint warranty certificate, WA0047, is included with this proposal.

TWO (2) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY
A Harrison Hydra-Gen limited warranty certificate, WA0051, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

Pierce manufacturing will provide a cab crash test certification with this proposal. The certification states that the cab must meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks

- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks

- Roof Crush

The cab will be subjected to a roof crush force of 100,000 lb. This value will be 450 percent of the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of ten (10) metric tons.

- Side Impact

The cab will be subjected to dynamic preload with a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of energy. This test will closely represent the forces a cab will see in a rollover incident.

- Frontal Impact

The cab will withstand a frontal force produced from 65,200 ft-lb of energy using a swing-bob type platen.

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

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

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

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
    - The nameplate rating of the alternator.
    - The alternator rating under the conditions specified per:

        - Applicable NFPA 1901 or 1906 (Current Edition).
    - The minimum continuous load of each component that is specified per:
        - Applicable NFPA 1901 or 1906 (Current Edition).
    - Additional loads that, when added to the minimum continuous load, determine the total connected load.
    - Each individual intermittent load.

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

DOCKET SUPPORTING INFORMATION CITY OF SAN DIEGO **EQUAL OPPORTUNITY CONTRACTING PROGRAM EVALUATION**	DATE: May 22, 2015
SUBJECT: Fire Apparatus Contract	

GENERAL CONTRACT INFORMATION

Recommended Contractor: Pierce Manufacturing (Not Certified, M Cauc)

Amount of this Action: $8,932,849.04

Funding Source: City of San Diego

Goal: N/A

SUBCONTRACTOR PARTICIPATION

There is no subcontractor participation associated with this action.

EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE

Equal Opportunity: Required.

Pierce Manufacturing submitted a Work Force Report for their Outagamie County employees dated, March 10, 2015, indicating 1,726 employees in their Administrative Work Force. The Administrative Work Force indicates under representation in the following categories:

Latino, American Indian, Filipino, and Female in Mgmt & Financial, Professional, and Administrative Support
Asian, American Indian, Filipino, and Female in Technical
Black, Latino, Asian, American Indian, Filipino, and Female in Operative Workers
Black in Professional
Latino, Filipino, and Female in Crafts
Latino in Laborers

Based on the under representations in the workforce noted above, staff has an approved Equal Employment Opportunity (EEO) Plan on file as of May 11, 2015. Staff will continue to monitor the firm's efforts to implement their EEO plan.

This agreement is subject to the City's Equal Opportunity Contracting (San Diego Ordinance No. 18173, Section 22.2701 through 22.2708) and Non-Discrimination in Contracting Ordinance (San Diego Municipal Code Sections 22.3501 through 22.3517).

ADDITIONAL COMMENTS

MM

The City of San Diego
COMPTROLLER'S CERTIFICATE

CERTIFICATE OF UNALLOTTED BALANCE

ORIGINATING BUS. AREA NO.: CC 3000007916
2113

I HEREBY CERTIFY that the money required for the allotment of funds for the purpose set forth in the foregoing resolution is available in the Treasury, or is anticipated to come into the Treasury, and is otherwise unallotted.

Amount: _____

Purpose: _____

Date: _____ By: _____
COMPTROLLER'S DEPARTMENT

ACCOUNTING DATA									
Doc. Item	Funded Program	Fund	Grant Number	G/L Account	Functional Area	Business Area	Fund Center or Cost Center	Internal Order or WBS Element	Original Amount
								TOTAL AMOUNT	

FUND OVERRIDE ☐

CERTIFICATION OF UNENCUMBERED BALANCE

I HEREBY CERTIFY that the indebtedness and obligation to be incurred by the contract or agreement authorized by the hereto attached resolution, can be incurred without the violation of any of the provisions of the Charter of the City of San Diego; and I do hereby further certify, in conformity with the requirements of the Charter of the City of San Diego, that sufficient moneys have been appropriated for the purpose of said contract, that sufficient moneys to meet the obligations of said contract are actually in the Treasury, or are anticipated to come into the Treasury, to the credit of the appropriation from which the same are to be drawn, and that the said money now actually in the Treasury, together with the moneys anticipated to come into the Treasury, to the credit of said appropriation, are otherwise unencumbered.

Not to Exceed: $8,932,849.04

Vendor: Pierce Manufacturing

Purpose: Authorize the Mayor or his designee to execute the contracts with Pierce Manufacturing to provide fire apparatus to the San Diego Fire Department.

Date: May 28, 2015 By: Robert Barreras Robert Barreras
COMPTROLLER'S DEPARTMENT

ACCOUNTING DATA									
Doc. Item	Funded Program	Fund	Grant Number	G/L Account	Functional Area	Business Area	Fund Center or Cost Center	Internal Order or WBS Element	Original Amount
1		720011		560045	OTHR-00000000-GG	2113	2113140012		$8,932,849.04
								TOTAL AMOUNT	$8,932,849.04

CC-361 (REV 7-09)

FUND OVERRIDE ☐

CC 3000007916

Psychiatric

Emergency

Response

Team

PERT is funded by the County of San Diego
HHSA & the MHSA Act

PERT MISSION

To provide effective and compassionate crisis intervention to individuals living with mental illness in the community who come to the attention of law enforcement, to access appropriate services and to optimize outcomes through on-scene assessments and referrals.

PERT GOALS

- Prevent unnecessary incarceration and/or hospitalization of mentally ill individuals.
- Provide alternative care in the least restrictive environment.
- Provide a coordinated and comprehensive system-wide approach.
- Allow police patrol units to return to service sooner.

REGIONAL PERT ACADEMY

- POST Certified
- 3-Days/24 Hour
  - All Sworn Law Enforcement
  - Limited non-sworn personnel (Dispatchers)
- Main Topics
  - Mental Health Recognition
  - De-escalation Techniques
  - Available Resources

ADDITIONAL PERT TRAINING

- 1-Day/8 Hour POST Certified PERT Academy
- Quarterly Training Day (10 hours)
- On-Going Line Up/Briefing Training
- Community Outreach/Training

THE PERT TEAM

- Licensed Mental Health Clinician and an Officer.
  - Each contribute particular skills and expertise.
  - Each receives preparatory and ongoing specialized training.
  - SDPD currently staffs 10 PERT teams.
  - Expansion Funding (MHSA & Public Safety Group) Impact for FY 2015-2016
    - 10 additional PERT teams (SD County wide locations to be determined by PERT Coordinating Council)
    - An increase of training days from 22 to 45

PERT

- 1 in 4 people will experience mental health issues within their lifetime.
- Law enforcement is often the first responder to the mental health crisis.
- Law enforcement has seen an increase of mental health calls by 110% since 2008.

110% increase 2008-2015 YTD

Year	Suicide, Mental Health , & PERT Calls
2008	8,988
2009	9,641
2010	10,833
2011	11,892
2012	13,770
2013	14,072
2014	16,100
2015 (Jan. – March)	4,196

San Diego Police Department
Suicide, Mental & PERT Calls by Division
January 2015 through March 2015

Division	Count	% of Total
Central	994	24%
Eastern	372	9%
Mid-City	545	13%
Northeastern	264	6%
Northern	415	10%
Northwestern	83	2%
Southeastern	547	13%
Southern	312	7%
Western	648	15%
Unknown	16	0%
Citywide	**4,196**	**100%**

ACCESSING A PERT TEAM

- **COMMUNITY**
  - Call SDPD Emergency/Non-Emergency line
    - Request a PERT unit (if available)
  - PERT unit is not available
    - Request a PERT trained officer

- **LAW ENFORCEMENT**
  - Request Through Dispatch
  - Referral Form

QUESTIONS ?

PERT (619) 276-8112