



Contract Pricing Worksheets

Rev 02-05-07

**NOTE: Purchase Orders are not valid unless a copy of the completed worksheet and the customer's order are faxed to HGACBuy at:
713-993-4548**

This Workbook contains three versions of HGACBuy's Contract Pricing Worksheet. One is for Standard Equipment / Services, one is for Catalog or Price Sheet type purchases, and the third is for Motor Vehicles only. See tabs at bottom to select appropriate Worksheet.

Please contact H-GAC staff about use of the worksheets if you have any questions.

**CONTRACT PRICING WORKSHEET**
For MOTOR VEHICLES Only**Contract No.:****FS12-15****Date Prepared:****2/28/2017****A. Product Item Base Unit Price Per Contractor's H-GAC Contract:**

Buying Agency:	Township of Berkeley, Bayville Fire Company	Contractor:	KME
Contact Person:	Gerd Trommer	Prepared By:	Doug Kelley
Phone:	732-244-7400 x1228	Phone:	570-669-5928
Fax:	N/A	Fax:	570-669-5123
Email:	gtrommer@twp.berkeley.nj.us	Email:	dkelley@kmeffire.com
Product Code:	MC06	Description:	KME Custom, 4-Door, Full-Title, Aluminum Cab, Alum Body, Single Axle, 2000 GPM Pump, 1000 Gal Tank-Flex Pumper

A. Product Item Base Unit Price Per Contractor's H-GAC Contract: \$ 335,376**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
KME-P011 Upgrade ULLH SCBA bracket to Secure All	\$1,510	KME-P057 Add 3" manual Extenda-Gun	\$1,635
KME-P203 Cab EMS Cabinet	\$2,218	KME-P063 Add Hurricane manual deck gun	\$2,367
KME-P013 Upgrade A/C to Overhead System	\$2,104	KME-P067 Add 1-1/2" front bumper discharge	\$2,454
KME-P020 Upgrade engine to Cummins ISL9 450 hp	\$6,902	KME-P051 Add additional 1-1/2" crosslay discharge	\$2,078
KME-P025 Upgrade electrical to Class 1 Es-Key	\$5,115	KME-P052 Upgrade crosslay to 2-1/2"	\$214
KME-P346 Promariner 40 amp Battery Charger	\$624	KME-P624 (3) triple storage bottle storage - body fender	\$4,305
KME-P389 Federal Signal Dual Camera System	\$1,622	KME-P625 (1) open storage compartment - body fender	\$1,250
KME-P398 FRC Brow Light	\$1,014	KME-P084 Upgrade officer side to full height / split depth	\$1,466
KME-P490 Federal Q2B Siren @ Cab Front	\$2,514	KME-P085 Upgrade ladder to enclosed storage	\$1,633
KME-P048 Add additional 2-1/2" Auxiliary Suction	\$985	KME-P097 Upgrade suction hose storage into body	\$175
KME-P053 Add 2-1/2" rear discharge	\$3,619	KME-P098 Upgrade compartment paint to Multispec	\$ 625
KME-P054 Add 2-1/2" hosbed discharge	\$1,833	Subtotal From Additional Sheet(s):	\$ 42,509
KME-P055 Add 3" deck gun discharge	\$2,122	Subtotal B:	\$ 92,893

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
Dealer Furnished Equipment	\$ 11,000	Upgrade body to Flex long body	\$ 159
Add (3) additional batteries	\$ 1,601	Two year base warranty	\$ 4,100
Change pump to Waterous CSU-C20-1500	\$ (283)	Subtotal From Additional Sheet(s):	\$ 84,053
Add booster reel	\$ 3,101	Subtotal C:	\$ 103,731

For this transaction the percentage is:**24%****D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C)**

Quantity Ordered:	1	X Subtotal of A + B + C:	532000	=	Subtotal D:	\$ 532,000	
HGAC \$2,000 included in Wildland Purchase for all units						Subtotal E:	\$ 2,000

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

Description	Cost	Description	Cost
Delivery (via driveway)	\$2,500		
Inspection Trips	\$1,500		
PDI / Service	\$4,000		
		Subtotal F:	\$ 8,000

Delivery Date: 11/24/2016**G. Total Purchase Price (D+E+F):**

\$ 542,000

B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description

Description	Cost	Description	Cost
KME-P101 Upgrade chassis paint to two tone	\$2,374	KME-P215 Cab EMS lighting, Amdor LumaBar	\$157
KME-P102 (11) adjustable shelves	\$4,246	KME-P250 (2) windshield defogger fans	\$402
KME-P103 (4) 250# floor mounted trays	\$3,028	KME-P251 (2) circulations fans for rear crew	\$383
KME-P107 (1) vertical divider	\$511	KME-P260 27" front bumper extension	\$1,288
KME-P112 Flooring material on all compts	\$1,069	KME-P270 Hosewell at center of bumper	\$624
KME-P113 Flooring material on (10) shelves	\$600	KME-P271 Velcro straps on well	\$173
KME-P114 Add 6 kW hydraulic generator	\$15,667	KME-P275 Hosewell on OS of bumper	\$624
KME-P508 FRC Pump Boss governor	\$1,966	KME-P276 Velcro straps on well	\$173
KME-P118 FRC 120 volt telescoping lights	\$1,790	KME-P347 Kussmaul air compressor	\$803
KME-P008 Upgrade driver seat to Bostrom air	\$464	KME-P352 3' long outlet strip	\$272
KME-P010 Upgrade officer's seat w/ SCBA	\$312	KME-P377 Blue Sea Fuse box	\$360
KME-P252 Add auxiliary manual cab lift	\$522	KME-P372 (3) 12 volt power ports	\$342
KME-P133 Custom cab roof treadplate overlay	\$997	KME-P391 Rear camera guard	\$121
KME-P134 Battery access doors	\$546	KME-P513 TFT intake relief valve	\$335
KME-P144 Locking cab door, out & in	\$731	KME-P518 (2) Waterous anode blocks	\$308
KME-P168 Stationary windows rear cab	\$134	KME-P521 Waterous OPM	\$641
KME-P179 Stainless steel cab fenderettes	\$546	Subtotal of Options Addtl	\$42,509

||C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.

[illegible]



Department: Sales Engineering
P73-1-F5
Weight Analysis Form

Original Issue Date: 12/20/2011
Revision: 2
Revision Date: 06/05/2012

DATE: 2/21/2017

BY: JJM

GSO: PROPOSAL

CUSTOMER - DEALER: BAYVILLE FD NJ

BODY STYLE: 172" FLEX LONG 3/16" ALUMINUM

CHASSIS MAKE & MODEL: 100"W KME PANTHER MFD 10" RR

WHEELBASE: 195

NUMBER OF PERSONNEL: 6

FRONT GVWR: 20000

REAR GVWR: 31000

TOTAL GVWR: 51000

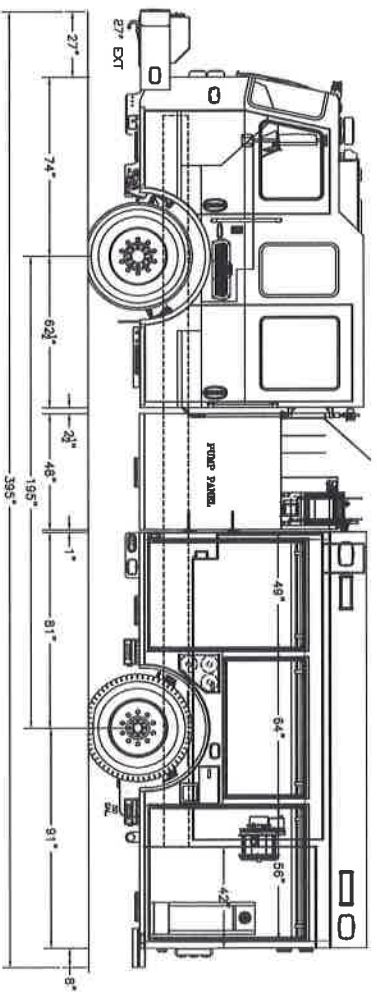
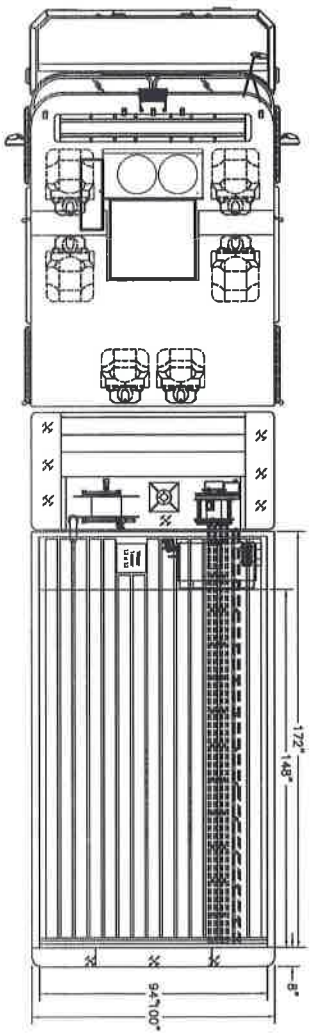
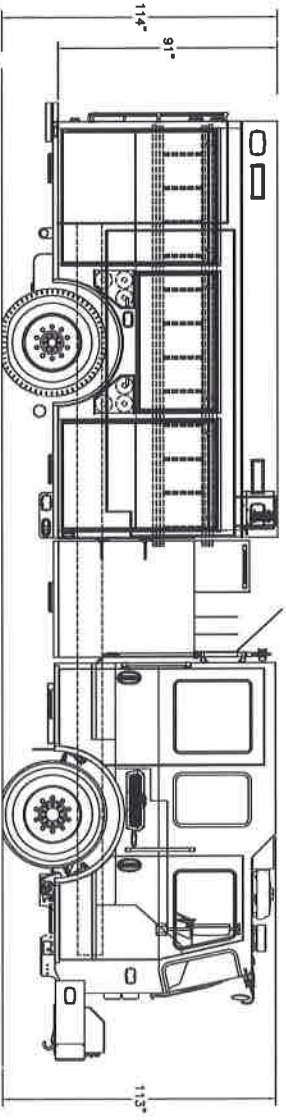
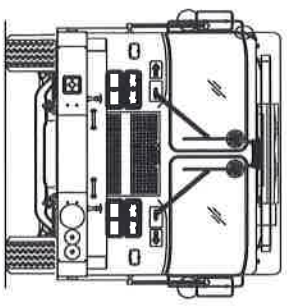
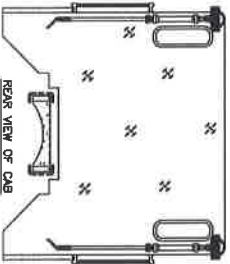
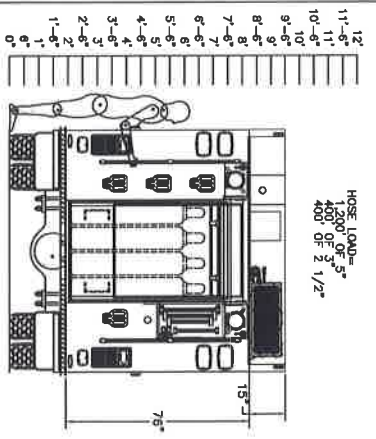
ITEM DESCRIPTION	ITEM DETAILS	ITEM WEIGHT	INCHES FORWARD OF REAR AXLE	WEIGHT ON FRONT AXLE	WEIGHT ON REAR AXLE
CHASSIS WEIGHT:		18719		14019	4700
PERSONNEL (DRIVER/OFFICER):	2	500	217	556	-56
PERSONNEL (CREW REAR FACING):	2	500	195	500	0
PERSONNEL (CREW FORWARD FACING):	2	500	156	400	100
BUMPER EXTENSION:		125	283	181	-56
BUMPER STORAGE WELL:	2	250	283	363	-113
CAB EMS CABINET:				0	0
PUMP WEIGHT:		1900	99	965	935
CROSSLAYS:	3	600	118	363	237
SPEEDLAYS:				0	0
DECK GUN:		80	99	41	39
FRONT SUCTION:			195	0	0
REAR SUCTION:			0	0	0
FRONT DISCHARGES:	1	75	195	75	0
REAR DISCHARGES:	1	100	0	0	100
TOP MOUNT PUMP PANEL:				0	0
REAR DIRECT TANK FILL:				0	0
HOSE REEL (INCLUDES HOSE):		250	99	127	123
WATER TANK (LOWER):	950	8455	17	737	7718
WATER TANK (UPPER):		0		0	0
FOAM TANK:		0		0	0
BODY WEIGHT:		3662	-5	-94	3756
EQUIPMENT ALLOWANCE:		2000	-5	-51	2051
LOCKER COMPARTMENT:				0	0
REAR STEP COMPARTMENT:				0	0
SCBA CYLINDER COMPT.:	0	0	0	0	0
HOSEBED (GENERAL):				0	0
HOSEBED (5"):	1200	1164	-5	-30	1194
HOSEBED (4"):		0		0	0
HOSEBED (3"):	400	320	-5	-8	328



Department: Sales Engineering
P73-1-F5
Weight Analysis Form

Original Issue Date: 12/20/2011
Revision: 2
Revision Date: 06/05/2012

DATE: 2/21/2017					
BY: JJM					
GSO: PROPOSAL					
CUSTOMER - DEALER: BAYVILLE FD NJ					
BODY STYLE: 172" FLEX LONG 3/16" ALUMINUM					
CHASSIS MAKE & MODEL: 100"W KME PANTHER MFD 10" RR					
WHEELBASE: 195					
NUMBER OF PERSONNEL: 6					
FRONT GVWR: 20000					
REAR GVWR: 31000					
TOTAL GVWR: 51000					
ITEM DESCRIPTION	ITEM DETAILS	ITEM WEIGHT	INCHES FORWARD OF REAR AXLE	WEIGHT ON FRONT AXLE	WEIGHT ON REAR AXLE
HOSEBED (2.5"):		0		0	0
HOSEBED (1.75"):	400	152	-5	-4	156
HARD SUCTION HOSES:	2	150	-5	-4	154
LADDERS:		214	-5	-5	219
GENERATOR:		190	66	64	126
LIGHTING:				0	0
SIDE DUMPS:				0	0
REAR DUMP:				0	0
PORTABLE WATER TANK:				0	0
Q2B:	1	33	283	48	-15
SIDE WELL:	2	250	106	136	114
CORD REEL IN DUNNAGE AREA:		125	99	63	62
CORD REEL IN SIDE REAR COMPT:		125	-66	-42	167
				0	0
4 DOT BOTTLES:	4	800	-66	-271	1071
CONTAINMENT FILL STATION		800	-78	-320	1120
				0	0
				0	0
		TOTAL		FRONT AXLE	REAR AXLE
SUB-TOTAL:		42039		17809	24230
2% SAFETY FACTOR (GVWR):		841		356	485
TOTAL:		42880		18165	24715
CHASSIS GVWR:		51000		20000	31000
WEIGHT DIFFERENCE:		8120		1835	6285
WEIGHT DISTRIBUTION (%):				42%	58%



CAB: 100" W KME PANTHER MFD 10" RR
ENGINE & TRANS: CUMMINS 19 450 HP/ALLISON 3000 EVS
AXLES: 20,000# FRONT/31,000# REAR
PUMP: WATEROUS CSU-C20-1500 GPM SINGLE STAGE PUMP
WATER TANK: 950 GALLONS POLY
BODY TYPE: 1/2" FLEX LONG 3/16" ALUMINUM
GENERATOR: ONAN 6,000 WATT PTO/HYD

THIS DRAWING IS A GENERAL
CONCEPTUAL AND MAY NOT
NECESSARILY REFLECT THE
FINAL DESIGN. ALL DIMENSIONS
SHOWN ARE APPROXIMATE. FOR
FINAL, OTHER DRAWINGS.

CUSTOMER APPROVAL:

NAME: _____
TITLE: _____
DATE: _____

DATE: 2-21-17
REVISED PROPOSAL
APPROVAL: _____
DATE: _____
REVISED PROPOSAL
APPROVAL: _____

ENGINEER AND APPROVAL: KME GROUP
SCALE: 1/8" = 1'-0"
DATE: 10-18-16
APPROVED BY: _____
KME CUSTOM PUMPER
BAYVILLE PD, NJ
PROPOSAL

KME GROUP
ONE INDUSTRIAL COMPLEX - HESOLBORNE, PA 15040

Houston Galveston Area Council # FS 12-15

PROPOSAL

KME is pleased to provide this proposal for a KME custom chassis Class "A" pumper. The proposal amount for the specified Custom Chassis Class "A" pumper is **\$542,000.00** (*Five hundred forty two thousand dollars 00/100*)

HGAC CONTRACT PURCHASE

The proposed unit is being purchased from K.M.E. Fire Apparatus under HGAC Buy Co-op number FS 12-15.

The proposed unit is listed on the K.M.E. Fire Apparatus price sheet as; **(MC06, KME Custom, 4-door, full tilt, Aluminum Cab, Aluminum Body, Single Axle, 2000 Pump, 1000 Gal Tank-Flex Pumper)**

GENERAL INFORMATION

The proposed apparatus will be constructed to withstand the severe and continuous use encountered during emergency firefighting services. The apparatus will be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained.

This proposal details the general design criteria of cab and chassis components, aerial device (if applicable), fire pump and related components (if applicable), water tank (if applicable), fire body, electrical components, painting, and equipment.

All items of these proposal specifications will conform to the fullest extent possible with the National Fire Protection Association Pamphlet No. 1901, latest edition, except as noted in the Statement-of-Exceptions.

KME will furnish satisfactory evidence of our ability to construct, supply service parts and technical assistance for the apparatus specified.

SINGLE-LINE RESPONSIBILITY

KME is a true "sole source" manufacturer. KME engineers, designs, manufactures, builds and paints our own fire apparatus cab, chassis, body, aerial devices and electrical systems. All work is done in KME owned and operated manufacturing facilities by KME direct employees. This capability provides consistent design and manufacturing procedures that will reduce warranty issues and provide ease in parts replacement.

PAINT PERFORMANCE CERTIFICATION

The proposed KME apparatus meets or exceeds the required Commercial Vehicle Paint Performance Standards.

DELIVERY TIME

KME is proposing to complete the apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by KME Fire Apparatus.

Delivery Time: 365 Calendar Days

DELIVERY PENALTY



Bayville Fire Company
Berkeley Township, New Jersey

Apparatus Specifications-
Custom Chassis, Class "A" Pumper

Ken Anderson

From: James Phillips <jphillips76@hotmail.com>
Sent: Thursday, March 09, 2017 6:01 PM
To: Ken Anderson; James Phillips
Subject: Re: Bayville questions from Town

Hi Chief,

Please see my replies to your questions below....

Please remember, due tot he station restrictions we are doing our best to make this large unit fit into the area provided. KME has SPO's into many of the vendors for specials to meet the requirements.

As always call me anytime.

Thank you,

Jimmy Phillips

***Please excuse any type-o's sent from tablet with wireless keyboard*

From: Ken Anderson <codeenforcement@twp.berkeley.nj.us>
Sent: Wednesday, March 8, 2017 9:07 AM
To: 'jphillips76@hotmail.com'
Subject: bayville

Good morning administrator went thru spec all is good he just had a few questions you can probably answer off the top of your head.

#1 page 1 shows 2000 gpm pump drawing is 1500 gpm just need to update pg 1 **Yes this is only the listing from the HGAC. In other words, if you were to look this unit up on the HGAC site, that is how is it listed. We changed from the 200 gpm to the 1500 gpm.**

#2 page 69 can they do an interlock or alarm for deck gun being raised. Just a question on it he just wasn't sure if it could done easily **Yes it is our standard.**

#3 page 1 just reflect the 950-1000 gal tank versus page 77 that shows 950-1000 they need to reflect same. **The tank size was made to accept a custom size due to your station requirements. The tank on any apparatus will vary to a slight degree, I only wanted to list this to be up front ahead of time.**

Besides that all is well give me a call I will explain any questions. Thanks

Houston Galveston Area Council # FS 12-15

Each day after 365 days that the apparatus is not delivered and accepted by the District there will be a One Hundred Dollar (\$100.00) per calendar day penalty. **NO EXCEPTIONS!!!!**

FAIR, ETHICAL AND LEGAL COMPETITION

In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (OEM) nor parent company of the OEM will have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this bid, KME and each person signing on behalf of any bidder, certifies, and in the case of a joint bid, each party thereof certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:

- The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for purpose of restricting competition, as to any matter relating to sell prices with any other bidder or any competitor.
- Unless otherwise required by law, the prices that have been quoted in this bid have not been knowingly disclosed by KME and will not knowingly be disclosed by KME prior to opening, directly or indirectly, to any other bidder or to any competitor
- No attempt has been made by KME to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.
- That all requirements of the law including amendatory provisions as to non-collusive bidding have been complied with.

MATERIAL AND WORKMANSHIP

All equipment furnished will be guaranteed to be new and of current manufacture, to meet all requirements of purchaser's specifications.

All workmanship will be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

APPROVAL DRAWING

A detailed drawing of the apparatus will be provided to the Township of Berkeley, Bayville Fire Company for approval before construction begins. A copy of this drawing will also be provided to the manufacturer's representative. Upon Township of Berkeley, Bayville Fire Company approval, the finalized drawing will become a part of the total contract.

The drawing will show, but is not limited to, such items as the chassis make and model, major components, location of lights, sirens, all compartment locations and dimensions, special suctions, discharges, etc. The drawing will be a visual interpretation of the apparatus as it is to be supplied.

INSPECTION VISITS

KME will provide three (3) factory inspection trips to KME's facility. Transportation, meals, lodging, and other requisite expenses will be the bidder's responsibility.

Accommodations shall be for four (4) Fire Department representatives per trip.

Houston Galveston Area Council # FS 12-15

The factory visits shall occur at the following stages of production of the apparatus:

- Pre-construction / blueprint review.
- Midpoint completion of entire apparatus.
- Final inspection upon completion.

ASE-EVT INSPECTION

The customer will employ two (2) ASE-EVT master technicians to inspect the vehicle after the final inspection at the manufacturer's facility.

The manufacturer will allow a fully uninterrupted inspection by the technicians on the property of the manufacturer. Any issues that are found will be reported to the apparatus committee and reported accordingly.

The apparatus committee will decide if the issues are minor or major. If the issues are deemed major the technicians will re-visit the facility to inspect the repaired issue(s).

Travel arrangements less than 300 miles from the manufacturing facility will be via ground transportation.

The customer maintains the right to inspect the apparatus, within KME's normal business hours. At any other point during construction expenses incurred during non-specified visits will be the responsibility of the customer.

During inspection visits, the customer reserves the right to conduct actual performance tests to evaluate completed portions of the unit. Testing will be accomplished with the assistance and resources of the contractor.

DELIVERY

Delivery of the apparatus to the Fire Department will remain KME's responsibility.

A qualified and responsible representative of KME will deliver the apparatus to the Fire Department.

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

KME will supply at time of delivery, two (2) CD copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual will contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device.
- Wiring diagrams.
- Lubrication charts.
- Operating instructions for the chassis, any major components such as a pump and any auxiliary systems.
- Instructions regarding the frequency and procedures recommended for maintenance.
- Parts replacement information.

VEHICLE FLUIDS PLATE

Houston Galveston Area Council # FS 12-15

As required by NFPA-1901, KME will affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle:

A permanent plate in the driving compartment will specify the quantity and type of the following fluids used in the vehicle:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid
- Drive axle(s) lubrication fluid
- Air-conditioning refrigerant
- Air-conditioning lubrication oil
- Power steering fluid
- Cab tilt mechanism
- Transfer case fluid
- Equipment rack fluid
- Air compressor system lubricant
- Generator system lubricant

PRIMARY PLANT CONSTRUCTION

In order to insure top quality construction, maximum assembly line and engineering communication and the highest level of manufacturing supervision the entire apparatus will be built at KME's (headquarters) manufacturing facility.

FAMA MEMBERSHIP

KME Fire Apparatus is a leading and proud member of the Fire Apparatus Manufacturer's Association (FAMA).

U.S.A. MANUFACTURER

The entire apparatus will be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service.

QUALITY MANAGEMENT

KME is certified ISO 9001 at all company locations. KME received its certification from Eagle Registrations Inc. after they assessed the company's quality system and found it to be in full compliance with ISO 9001. Eagle is accredited as a registrar by ANSI-ASQ National Accreditation Board (ANAB), the organization responsible for qualifying registrars as competent to audit and certify organizations conforming to ISO 9001 or other management system standards.

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies from 130 countries. Its ISO 9001 standard is a quality assurance model made up of 20 sets of quality system requirements. This model applies to organizations that design, develop, produce, install, and service products.

Houston Galveston Area Council # FS 12-15

This business management system allows KME to monitor processes to ensure they are effective; keep adequate records; check output for defects, with appropriate and corrective action where necessary; regularly review individual processes and the quality system itself for effectiveness; and facilitate continual improvement.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body will meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces will be Alcoa No-Slip type. This material will be a minimum 3/16 (0.1875") in thickness. KME will supply proof of compliance with this requirement. All vertical surfaces on the body, which incorporate aluminum tread plate material, will utilize the same material pattern to provide a consistent overall appearance.

AMP DRAW REPORT

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

A written load analysis, which shall include the following:

- The rating of the alternator.
- The minimum continuous load of each component that is specified per: Applicable NFPA-1901.
- 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 shall be provided by the bidder per the applicable NFPA-1901.

COOPERATIVE PURCHASING

KME is pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid. The condition of such use by other agencies will be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with KME. Such tag-on's will be done so that the original purchasing agency has no responsibility for performance by either KME or the agency using the contract.

GENERAL APPARATUS DESCRIPTION "PUMPER"

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2016 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment

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- Chapter 18 Water Tanks
- Chapter 22 Line Voltage Electrical Systems
- Chapter 24 Air Systems

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry shall be visible to the driver.
- "Occupants will be seated and belted when apparatus is in motion" signs shall be visible from each seat.
- "Do Not Move Apparatus When Light Is On" sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).
- A label displaying the height, length, and GVWR of the vehicle shall be visible to driver.
- This label shall indicate that the fire department will revise the dimension if vehicle height changes while vehicle is in service.

CHASSIS DATA LABELS

The following information shall be on labels affixed to the vehicle:

Fluid Data

- Engine Oil
- Engine Coolant
- Chassis Transmission Fluid
- Pump Transmission Lubrication Fluid
- Drive Axle(s) Lubrication Fluid
- Air Conditioning Refrigerant
- Air Conditioning Lubrication Oil
- Power Steering Fluid
- Cab Tilt Mechanism Fluid
- Transfer Case Fluid (if applicable)
- Air Compressor System Lubricant
- Generator System Lubricant
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Maximum Tire Speed Rating

Chassis Data

- Chassis Manufacturer
- Production Number
- Year Built
- Month Manufactured
- Vehicle Identification Number

Manufacturers weight certification:

- Gross Vehicle (or Combination) Weight Rating (GVWR or GCWR)

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- Gross Axle Weight Rating, Front
- Gross Axle Weight Rating, Rear

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2016 NFPA Standard for Automotive Fire Apparatus.

PRINCIPAL APPARATUS DIMENSIONS & G.V.W.R. (ALL SIZES CARRY A +2" -2" TOLERANCE)

- OVERALL LENGTH: 395" (may reduce rear bumper to cut OAL down) *32.9 ft*
- OVERALL WIDTH: 100" (does not include bolt on items, mirrors, handles)
- OVERALL HEIGHT: 114" *9.5 ft*
- WHEELBASE: 195"

The axle and total weight ratings of the completed apparatus will not be less than the following minimum acceptable weight ratings:

- MINIMUM FRONT G.A.W.R.: 20,000 lbs.
- MINIMUM REAR G.A.W.R.: 27,000 lbs.
- MINIMUM TOTAL G.V.W.R.: 47,000 lbs.

KME will include the principal dimensions, front G.A.W.R., rear G.A.W.R., and total G.V.W.R. of the proposed apparatus. Additionally, KME will provide a weight distribution of the fully loaded, completed vehicle; this will include a filled water tank, specified hose load, miscellaneous equipment allowance in accordance with NFPA-1901 requirements, and an equivalent personnel load of 250 lbs. per seating position.

SEAT BELT ANCHOR TESTING

Each seat belt anchor shall be tested to withstand 3,000lbs of pull on both the lap and shoulder belt in accordance with FMVSS 210 section 4.2.

SEAT MOUNTING TESTING

Each seat mounting position shall be tested to withstand 20G's of force in accordance with FMVSS 207 section 4.2(c).

Both tests shall be performed and verified at a third party testing and evaluation center.

**** CAB AND CHASSIS ****

"PREDATOR"™ PANTHER" CAB TYPE

- FULL TILT
- CONTOUR WINDSHIELD

The cab shall be a custom tilt style, built specifically for fire service. The cab shall be a cab over engine design, with integral tilt mechanism and engine access from inside the cab.

Cab shall be designed, fabricated, assembled in its entirety, and installed on the frame rails in the manufacturer's factory. This requirement will eliminate any split responsibility in warranty and service.

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OPEN SPACE DESIGN

The cab interior shall be the "Open-Space" design with no wall, window or vertical support posts between the front and rear crew areas to allow direct communication, better visibility and air circulation in the cab.

CAB MATERIAL - ALUMINUM

The cab shall be fabricated from 5052-H 32 aluminum alloy, utilizing the minimum material thickness as follows:

- | | |
|--------------------------------|----------------------|
| • Cab side panels | 0.125 thick (1/8") |
| • Cab roof | 0.125 thick (1/8") |
| • Forward cab front sheet | 0.125 thick (1/8") |
| • Interior cab panels | 0.125 thick (1/8") |
| • Other panels | 0.125 thick (1/8") |
| • Cab doors | 0.1875 thick (3/16") |
| • Engine enclosure side panels | 0.250 thick (1/4") |

CAB - BASE CONSTRUCTION

Cab sub-frame shall be a welded assembly fabricated of 6063 structural aluminum alloy. This frame shall extend the full length and width of the cab and be secured to the chassis frame through two (2) rear urethane self centering load cushions, two (2) forward pivot brackets, and two (2) cab locks. The cab shall be of entirely welded construction.

The front cab wall shall be of double wall type construction, featuring an inner and outer panel.

CRASH TESTING CERTIFICATION

To ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

Furthermore, proof of testing and certification shall be provided that the cab, in accordance to SAE J2420 was front impact tested at 2.1 times the standard energy required in SAE J2420, thus exceeding the NFPA requirement.

This test shall be performed with no support immediately behind the cab, thus providing an authentic test result.

ROOF AND SIDE LOAD TESTING

The cab design will include additional third party testing to ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

The manufacturer shall provide proof that third party testing has been conducted to prove a static roof and a static side-load test has been completed. In these tests, a 120,000 pound static load was first applied to the roof. This test was followed by applying the same 120,000 pound static load to the side of the cab.

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These tests will be conducted per the SAE J2422, Cab Roof Strength Evaluation, protocol and the ECE R29, Uniform provisions concerning the approval of vehicles with regard to the protection of occupants of the cab of a commercial vehicle, protocol.

During both tests, the cab will withstand these loads without encroachment into the occupant survivable space and all doors remained closed during the test. The tests will be documented with photographs and real-time video in a report provided to the manufacturer.

DIMENSIONS - MEDIUM FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

- | | |
|---|--------------------------------|
| • Overall width | 100" |
| • Inside width across ceiling | 92" |
| • Front area floor to ceiling | 61" |
| • Crew seat area width | 92" |
| • Outer crew seat risers to rear wall | 42" |
| • Centerline front axle to back of cab | 62-1/2" |
| • Centerline axle to front of cab | 74" |
| • Top of front seat to ceiling | 44" (depending upon seat type) |
| • Seat back to steering wheel | 22" (depending upon seat type) |
| • Inside width (door to engine enclosure) | 27" (driver's side, at floor) |
| • Inside width (door to engine enclosure) | 24" (officer's side, at floor) |
| • Floor to top of engine enclosure | 27" |
| • Front cab floor to top of center dash | 34-3/4" |

Glass Area Dimensions:

- | | |
|----------------------------------|------------------|
| • Windshield (Contour) | 3,422 sq. in. |
| • Front door window, retractable | 743 sq. in. each |
| • Rear door window, retractable | 875 sq. in. each |
| • Fixed side windows | 620 sq. in. each |

Cab Entry Door Width Dimensions

- | | |
|------------------------|----------|
| • Forward door opening | 40" wide |
| • Rear door opening | 37" wide |

Cab Entry Step Dimensions

- | | |
|------------------------------|--------------------|
| • Forward door recessed step | 32" wide x 9" deep |
| • Rear door recessed step | 32" wide x 9" deep |

Cab Entry Door Height Dimensions

- | | |
|------------------------|--------------|
| • Forward door opening | 76-1/4" high |
| • Rear door opening | 85-1/4" high |

CAB ROOF

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The roof will be of a split level design with radius edges for an aesthetic, streamline appearance. The roof shall be constructed the same material as the main structure and shall be internally reinforced using framing which shall span the entire width and length of the cab for maximum structural integrity. This shall allow the roof to support personnel and roof mounted equipment without the need for additional reinforcement.

The cab roof over the rear crew area shall be raised ten (10) inches higher than the front driver and officer area. The front face of the raised roof section shall be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design shall allow for additional interior height in the rear crew area.

The rear crew area doors shall be "Vista-Style", extending full height to the radius edge of the raised roof.

Approximate dimensions:

- Crew area floor to ceiling 64"
- Top of crew seat to ceiling 46" (depending upon seat type)

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, an integral drip rail shall be furnished on each side of the cab roof. The drip rail shall extend the full length of the cab roof.

STEPWELL BATTERY ACCESS DOOR

The battery access door(s) shall be 1/8" aluminum tread plate, drop down door with thumb latches at the rear driver's side cab step well.

CAB DOORS

Four (4) side-opening doors shall be provided. The cab doors shall be totally aluminum construction with an extruded aluminum frame and an aluminum outer door skin. Doors shall be full height from the step to the cab roof extrusion and enclose the step area when the doors are closed.

The forward cab door opening shall be a minimum of 40" wide, and the rear cab door opening shall be a minimum of 37" wide. The rearward cab doors shall have a radius cutout allowing the door opening to protrude forward over the cab wheel well, while providing full access to the rear crew area.

There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 6" wide belting material shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

Each of the forward entrance steps shall be a minimum of 8-1/2" deep with the floor board recessed a minimum of 5" to avoid "shin knocking". Each step shall be a bolt-in cast aluminum step.

Each of the rear entrance steps shall be a minimum of 8-1/2" deep. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each step shall be fabricated as an integral part of the cab construction. The cab step risers shall be painted to match the cab exterior color.

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Each lower step shall be a bolt-in cast aluminum step.

DOOR LATCHES

A semi-recessed chrome plated pull handle, capable of operating with a gloved hand, shall be provided on the exterior of each cab door. Heavy-duty, bright finish cast paddle latches shall be provided on the interior of each cab door. Door latch mechanisms which utilize spring steel clamps shall not be considered due to their tendency to both rust and break. The interior door latch cables are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.

LOCKING CAB DOORS

Each exterior cab door shall be equipped with keyed locks. The cab doors shall be capable of being locked from the outside with a key and from the inside with a control in each interior paddle latch.

The specified door lock cylinder/s shall be equipped with #2001 key/s.

DOOR WINDOWS

Each side cab door shall have a tinted retractable window operated by a hand crank mechanism. The window track shall be designed into the door frame extrusion, which shall be extruded with a track groove to house a window track and seal. The window shall be capable of being removed from an access slot designed in the bottom of the door frame.

DOOR WINDOW TRIM

Each side cab door window shall be designed with a custom extruded trim plate, which shall conform to the perimeter of the window opening in each door. The trim plate shall extend from the edge of the door skin to the window and shall have a silver anodized finish.

INNER DOOR PANELS

The cab door interior panels shall be covered with a one piece, brushed stainless steel panel, full height. The panel shall be 16 gauge stainless steel with a brushed finish and shall be designed to allow easy access to the inner door.

DOOR WARNING - CHEVRON (DEALER INSTALLED)

Four (4) Chevron reflective signs shall be installed on the lowest portion of the inner door panels, one (1) on each door. These chevrons shall cover at least 96 in².

EXTERIOR CAB WALL OVERLAY

A bright finish aluminum tread plate overlay shall be provided over the entire exterior rear cab wall. The tread plate overlay shall be sealed with caulking around the edges to prevent moisture from getting between the cab and the overlay.

WINDSHIELD/GLASS

A two piece, symmetrical, safety glass windshield shall be provided on the cab for the driver and officer providing a clear viewing area. The windshields shall be full width to the center of the front cab support for each side and provide the occupants with a panoramic view. To provide enhanced peripheral vision on each side of the cab, the windshield and cab structure shall be designed with radius corners,

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which provide a minimum of 8" of glass area, measured from the glass face to the side edge near the door post. The windshield shall consist of three (3) layers; the outer light, the middle safety laminate and the inner light. The thick outer light layer shall provide superior chip resistance, the middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage and the inner light shall provide yet another chip resistant layer.

The windshield will be a contour design with 3422 sq. in. of area for improved visibility and style. The windshield glass shall be designed so it can be used on either the driver or officer side. Single piece windshields that utilize epoxy or that are bonded to the cab structure shall not be acceptable.

WINDSHIELD WIPERS AND WASHER

Dual, electric operated, pantographic type windshield wipers shall be provided. One (1) electric drive motor shall be provided for each wiper.

Wipers shall have "HI/LO" and "INTERMITTENT" operating speeds. "HI/LO" speeds shall be controlled by a steering column control, within the turn signal control stem. "INTERMITTENT" operation shall be controlled by a twist switch within the control on the steering column. The wipers shall be of the self-parking type.

Windshield washers shall be electric operated wet-arm type with a 3/4 gallon washer fluid reservoir, mounted inside the engine enclosure and readily accessible through the engine hatch at the rear of the engine enclosure. The washer control shall be integral with the intermittent wiper control switch.

There shall be individual removable panels on the front face of the cab for access to the wiper motor assemblies.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Windshield wipers shall survive testing in excess of 3 million cycles in accordance with section 6.2 of SAE J198 "Windshield Wiper Systems – Trucks, Buses and Multipurpose Vehicles". The bidder shall certify that the wiper system design has been "Third party tested" and that the wiper system has met this criterion.

CAB SIDE VIEWING WINDOWS

A fixed, tinted window with 620 sq. in. of glass area shall be provided on each side of the cab behind the forward cab doors. This window will be the same height as the window in the rear cab door for maximum visibility.

STATIONARY VIEWING WINDOWS

Two (2) 22"H x 6"W stationary viewing windows shall be provided on the rear wall of the cab, one (1) each side, at the outboard edge. Each window shall be installed with a rubber gasket.

DARK TINTED REAR WINDOW GLASS

The windshield and the forward cab door glass shall be provided with standard DOT green automotive tint. The side cab windows to the rear of the front doors, the rear cab door windows and any rear viewing windows shall be equipped with a dark automotive tint.

GRAB HANDLES

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Four (4) 1-1/4" diameter x 28" long, knurled bright anodized aluminum handrails shall be provided, one (1) at each cab door entrance. Grab rail stanchions shall be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets shall be provided between each stanchion base and the cab surface.

INTERIOR GRAB RAILS

Grab rails shall be provided to assist in entry and exiting of the cab. Each grab rail shall be a cast aluminum "D" style handle that shall have a wheelabrated finish and shall be located in the following locations:

- One (1) 11" long, horizontally mounted, on each front cab door on the upper interior door panel
- One (1) 12" long, vertically mounted, on the officer's side "A" post
- One (1) 11" long, horizontally mounted, on each rear cab door on the interior door panel
- One (1) 30" long, horizontally mounted, on each rear cab door, located approximately 8" above the bottom of the window opening
- Three (3) 12" long, vertically mounted, one (1) on the driver's side cab interior on the "A" post and one (1) each side of the cab interior on the "C" post in the crew area

FRONT CAB GRILL (SQUARE)

A square mirror finished stainless steel grille shall be installed to allow for maximum air flow to the charge air cooler and the radiator.

A center nameplate will be included in the grill.

AIR INTAKE/OUTLET

Two (2) shaped, mirror finished stainless steel air inlets/outlets shall be provided horizontally above the wheel well opening, one on each side of the cab. The grilles shall be equipped with a mesh screen to serve as a secondary ember separator. The design shall permit proper ducting of air through the engine compartment and cooling system.

ENGINE AIR INTAKE SYSTEM

The left side inlet, used for the air intake to the air cleaner, shall be equipped with dual ember separators for separating burning embers from the air intake system. This system shall be such that particles larger than .039 inches (1 mm) in diameter cannot reach the air filter element.

No part of the air intake system for the engine shall be lower than the top of the frame rails to ensure the vehicle can navigate pooled water without any part of the air intake system being exposed to water when the vehicle is stopped or in motion. Chassis designs, which the engine air intake system is lower than the frame rails shall not be acceptable!

CAB WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well

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liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion.

CAB FENDERETTES

The cab wheel well openings shall be trimmed with replaceable, bolt-in, polished stainless steel fenderettes. The fenderettes shall be secured to the cab with stainless steel threaded fasteners along the internal perimeter of the wheel well. Dissimilar metal tape and black vinyl trim molding shall be used where the cab and fender meet.

FRONT MUD FLAPS

Heavy duty, black rubber type mud flaps shall be provided behind the front wheels.

RETRAC MIRRORS, HEATED, REMOTE CONTROL with 8" CONVEX

Two (2) Retrac 613275 mirrors shall be furnished, one on each front cab door. Each mirror shall have a 19 x 8 flat glass viewing area mounted in a chrome plated housing. All heads shall be electrically heated. The upper flat glass portion shall be electrically controlled from the driver's seating position and the lower convex sections shall be manually adjustable.

The stainless steel loop mounting bar shall be installed on the forward portion of each front door in front of the side windows with an upper and lower mounting bracket. Two (2) 8" diameter convex mirrors shall also be installed, one on each lower loop of the main mirror mounting bracket.

MIRROR CONTROL/S

To minimize wire circuits roughed from the dash to the door, the mirror position and heat (if applicable) controls shall be programmed into and controlled from the multiplex control screen.

EXTENDING CONVEX MIRROR

One (1) Velvac, 8" (minimum) convex mirror 714721 extending mirror shall be provided and installed right hand side of cab extending forward off of cab roof. Support brackets shall be made of stainless steel material.

INTERIOR TRIM

The cab interior shall be constructed to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

The forward overhead panel shall be a fabricated aluminum module painted to match the interior. This module shall contain the integrated windshield defroster/heater.

The headliner and rear cab wall shall utilize gray Durawear material, with padding underneath, to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted with dark gray Line-X material.

INTERIOR REAR WALL

The interior rear wall of the cab shall be covered with gray Durawear for durability and shall match the other upholstered areas of the cab.

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A twelve (12) inch high bright finish aluminum tread plate scuff plate shall be provided on the lower portion of the rear interior cab wall.

UNDER SEAT STORAGE COMPARTMENTS

There shall be a compartment provided under each front seat. Each compartment shall be accessible from the front of the seat riser when the door is opened.

BARYFOL FLOORING

The floor of the driver's compartment and the floor of the crew area shall be lined with BARYFOL vinyl composite flooring to comply with NFPA noise and heat requirements.

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a Durawear material formed overlay to match the balance of the cab interior. This Durawear overlay shall provide superior cab insulation against noise as well as improved heating and air conditioning performance. The Durawear layer shall then be overlaid with formed aluminum panels which shall be coated with Line-X to provide a rugged surface for this high wear area. **Note:** Cab interiors which feature the base aluminum structure painted with high impact resistant paint are not acceptable; the Durawear layer is required between the base structure and the impact panels to provide desired interior conditions.

To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from material providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1901 pamphlet.

A padded, hinged access door shall be provided in the top rearward portion of the engine enclosure. The door shall allow access to the engine oil, transmission fluid, power steering fluid level dipsticks and the windshield washer fluid reservoir. The access door shall be provided with two (2) flush mounted latches and gas shock holders. There shall be a Durawear material cover over the access door to give a cleaner look to the top of the engine enclosure and doghouse area.

ENGINE ENCLOSURE

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The enclosure shall be an integral part of the cab structure, which shall be constructed from a minimum of .25" 5052-H32 aluminum. This material shall be welded to the floor sub frame on each side of the cab and shall extend from the very front of the cab to the rear of the engine enclosure.

The Line-X overlay panels shall be dark gray in color.

The rear section of the engine enclosure shall be reduced 8-1/2" in length to provide additional leg room for the forward facing seating position/s.

SUN VISORS

To provide maximum protection for the driver and officer, two (2) dark polycarbonate sun visors shall be mounted in the cab overhead on each side.

******* CAB SEATING & ACCESSORIES *******

DRIVERS SEAT

The driver's seat shall be a H. O. Bostrom Tanker 450 Air-50 RX/HD/ABTS LH air-suspension, SCBA seat. The seat shall have tapered and padded bolsters and low profile seat cushion. The seat shall have a five inch fore and aft adjustment, a three inch height adjustment. The seat shall include a SCBA storage area with integral headrest. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The driver seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The driver's seat shall be equipped with an H. O. Bostrom Heavy Duty air ride suspension.

OFFICERS SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 ABTS RH series fixed base SCBA seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking

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system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

REAR FACING, OUTBOARD, DRIVER SIDE SEAT

The driver's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS RH series fixed base SCBA seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The driver's side rear facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

REAR FACING, OUTBOARD, OFFICER SIDE SEAT

The officer's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS LH series fixed base SCBA seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's side rear facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

CENTER FORWARD FACING CREW SEATS

Two (2) center inboard forward facing crew seats shall be provided. Each seat shall be H. O. Bostrom Tanker 450 ABTS series fixed SCBA seat and shall have a tapered and padded seat cushion with lumbar support.

Each seat shall include an SCBA storage area with integral headrest.

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Each seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

***Note, there will be a 12" space between each forward facing seat.

The two (2) center inboard forward facing crew seats shall have a flip-up style seat.

Each center forward facing seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

FORWARD FACING CREW SEAT RISER

The center forward facing seats shall be mounted on an aluminum riser that shall be mounted in the center of the cab. The riser shall match the interior of the cab and shall have individual, tread plate compartment doors with latches, to provide additional storage space in the cab.

SEAT UPHOLSTERY MATERIAL

The seats shall be upholstered with heavy duty gray tweed Durawear material as provided by Bostrom.

PADDED SCBA OPENING COVERS (DRIVERS SEAT ONLY)

One (1) removable padded covers shall be provided for the SCBA seat openings.

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus shall be equipped with a Class 1 seat belt warning system. The system shall consist of a Seat Belt module and shall display the seating positions through the main UltraView screen.

Seat belt and seat cushion sensors shall be provided on the six (6) specified seating positions.

HELMETS STORED IN BODY COMPARTMENT

All helmets will be stored in a specified body compartment whenever the vehicle is in motion.

VEHICLE DATA RECORDER

A Class 1 Vehicle Data Recorder (VDR) system shall be provided. The system shall include an NFPA compliant "Black Box" with reporting software that shall be capable of data storage to coincide with the NFPA requirements.

Data storage capabilities shall include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- VDR, date & time stamp

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- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)
- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- PC / Mac Compatible
- Data summary reports

The VDR data shall be downloadable by USB cable to a computer using either Microsoft or Apple operating systems.

INTERIOR CAB STORAGE COMPARTMENT

A storage compartment shall be mounted against the rear wall of the engine compartment in the cab crew area. The compartment size shall be decided during the pre-construction meeting.

The compartment shall be constructed of smooth aluminum and shall be equipped with a roll-up door. The compartment shall be painted with **Line-X** paint, matching the interior color of the cab.

****NOTE- The exact size of this compartment will be decided at the pre-construction meeting.

***C/S See attached QW image.

The EMS compartment shall be equipped with one (1) Amdor LED interior light(s). The lighting shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

The LED lights will be green in color.

ENGINE ENCLOSURE STORAGE MODULE

A storage module shall be installed on the center of the engine access door between the rear facing seats. The module shall be constructed of 1/8" aluminum and shall be coated with scuff resistant paint to match the cab interior. The module shall include two (2) flat open storage areas and six (6) divided storage area's for 3-ring binders.

PAC TRAC

Aluminum Pac Trac #7000 channel material for tool and equipment mounting shall be provided on the rear cab wall, driver side. Approximate size shall be 50" x 18". All installation hardware shall be stainless steel.

PAC TRAC

Aluminum Pac Trac #7000 channel material for tool and equipment mounting shall be provided on the rear cab wall, officer side. Approximate size shall be 50" x 18". All installation hardware shall be stainless steel.

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***** CAB INSTRUMENTATION & CONTROLS *****

DASH & CENTER CONSOLE

The dash shall be a custom formed, Line-X aluminum housing to create an ergonomically designed interior that will be user friendly and functional for the driver and officer.

The instrument cluster shall be centered in front of the driver and all gauges shall be installed in a non glare, pewter finish panel.

All warning lights and indicators shall be located in either the gauge itself or in the lower center portion. Each gauge shall be equipped with an international symbol that is easily recognizable; denoting the system being monitored. Instrumentation shall be backlit for easy identification when activated.

The transmission gear selector shall be located on the left side of the center dash assembly, toward the driver for easy access.

DRIVER'S DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall have a hinged bottom with two ¼ turn latches at the top. The panel shall be made of 1/8" aluminum with an anti-glare, pewter brushed surface and shall contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

The lower portion of this panel can be used for the installation of up to five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch over-ride, ATC mud-snow, inter-axle diff lock, electric fuel pump, all wheel drive, etc.

The main instrument panel shall contain the primary gauges. An ignition and engine start switch shall be located on a panel to the left upper portion of the driver's side dash panel.

Each gauge shall have a raised glass lens with a black matte finish trim ring and be backlit by integral white LEDs. Each gauge shall also possess an integral red warning light with a pre-programmed warning point. Each gauge warning indicator shall be capable of activating an audible alarm inside the dashboard.

The primary gauges shall consist of:

- Vehicle speedometer, (0-80 mph)
- Engine tachometer, (0-3000 rpm)
- Engine oil pressure, (0-100 psi); low oil warning
- Engine coolant temperature (100-280 °F); high engine temp warning
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low oil pressure warning at 65 psi
- Fuel level (E - 1/2 - F); low fuel level warning
- Air cleaner restriction gauge (0-40), warning at 25"

Additional auxiliary control switches and instruments (if applicable) shall be located within the dash panel and overhead panel located near the driver's position.

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- Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank
- Engine Compression Brake Controls

CLASS 1 DISPLAY

An UltraView 450 4.3" display shall be provided on the dash for the electrical Class One ES-Key multiplex system. The exact location shall be determined by the totality of instruments and switches on the cab dash.

ADDITIONAL CLASS 1 ULTRAVIEW 450 ON OFFICER SIDE OF CAB

An additional Class 1 UltraView 450 4.3" display shall be recessed mounted on the officer side of the cab. The second display shall have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

INDICATOR CLUSTER

The driver's dashboard panel shall consist of Ametek gauges, an 18 item instrument warning light cluster and a 16 item, dead front type alarm panel.

This display shall contain the system control unit that collects data from the vehicle data bus (J1939), analog sensors, and switches throughout the vehicle. This data shall be presented using gauges, telltales and the two (2) display panels. The warning light display shall include a 2 x 20 dot matrix display, 18 telltales and 2 buttons to navigate through the screen menus.

The LCD dot matrix display shall be a 2 line by 20-character display with each character being 7 dot by 5 dot configuration. FSTN technology shall be used on the display for wide viewing capability. The module shall be backlit with amber LEDs. The unit shall also be supplied with a heater to ensure proper operation over the entire 40 to +85 deg. C.

This display contains a series of two (2) screens to provide information about the vehicle. To control the display of that information, the screens are divided into two (2) menus; one that can be displayed while the vehicle is in motion and one that can only be accessed when the parking brake is set.

On the Road displays include:

- Two (2) configurable displays that can show any of the parameters the unit collects. This includes odometer, trip information, fuel economy information; all gauge data, and virtually any other data available on the vehicle that the display has access to, either through the data bus or via analog inputs.
- Two (2) trip displays for miles and hours that are capable of being reset.
- Two (2) fuel data screens: shall be provided; one for fuel remaining until empty and one for fuel economy. The fuel economy display shall be capable of being reset so that average economy over a predetermined period can be displayed.

The displays that can be accessed when the parking brake is set include:

- Engine hours as maintained by the engine ECU
- Service Alarm screens to report miles to next service or miles past required service. These screens shall allow the operator to choose the length of the service interval and shall have the ability to reset it.

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- Message screens with warning messages the display has collected during the current ignition cycle. These screens shall be divided into configured warnings such as "Low Air Pressure" and the data bus faults reported by ECU's on the vehicle. Both lists shall allow the operator to review the last 12 events that occurred on the vehicle for maintenance and troubleshooting purposes.
- Diagnostic screens shall test the instrumentation system to verify it is working correctly.
- Setup screens shall be used to select either English or metric display. They shall also allow the operator to choose the data that shall be displayed by the configurable on-the-road screens.

The system shall be configured with user defined warning messages such as Low Air Pressure or High Coolant Temperature. When these events occur the warning message shall come up on the screen and can be accompanied by a buzzer. The messages shall be prioritized so the most important messages are always displayed. Whether the message can be dismissed by pressing a button shall be configurable. Messages that have been dismissed but are still active shall be retained in the message screens for review until the ignition is turned off.

LOWER RIGHT AUXILIARY SWITCH PANEL

The driver's lower right panel shall be capable of housing five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch over-ride, ATC, inter-axle diff lock, electric fuel pump, all wheel drive, etc.

PUMP SHIFT CONTROL

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left panel.

The pump shift control shall be a Mil Spec toggle switch with mechanical detents mounted in a fully backlit panel that shall have indicators for "Pump Engage" and "Ok To Pump". The mode of the transfer case shall be controlled by remotely mounted air solenoids which shall be activated and monitored through the chassis control logic of the multiplex system.

MOBILE TERMINAL AREA

There shall be a flat surface area in front of the officer for placement of a laptop computer.

HEATER/DEFROSTER AND AIR CONDITIONING SYSTEM - VISTA

System shall be a dual roof mounted SGM air conditioning system capable of cooling a heat soaked cab interior temperature of 100°F down to 73°F in 30 minutes with an outside ambient air temperature of 100°F and 50% humidity.

System shall utilize one (1) International Components Engineering #TM-31 HD compressor, mounted as close to level as practicable. The compressor shall have a serpentine Poly "V" drive belt system installed in accordance with the compressor and belt manufacturer's requirements.

Air conditioning hoses and fittings shall be appropriately sized to the compressor and other specified air conditioning components. Minimum hose size, shall be #10 hose for discharge and #12 hose for suction. Steel hose end fittings shall be provided at the compressor. The air conditioner hose shall be

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the Aeroquip "Easy Clip" style hoses as recommended by Aeroquip. The A/C hoses shall utilize FC802 Aeroquip hose with re-usable JIC 37 degree fittings.

One (1) condenser, rated at a minimum of 72,000 BTU cooling and 104,000 BTU heating shall be provided on the cab roof. Both the front and rear overhead units shall include the heating units. (if applicable, the raised roof shall be equipped with notch to accommodate the condenser unit)

Two (2) evaporators, with a minimum blower output of 720 CFM through the louvers shall be provided. Both evaporator units shall be mounted on the cab roof, enclosed by aluminum panels painted white. The evaporator louvers and controls shall penetrate the cab roof into occupant compartments to the least extent practicable. Fourteen (14) 3" diameter adjustable louvers shall be furnished, four (4) in the front crew area and eight (8) in the rear crew area of the cab. The A/C drain lines shall be routed to the inside of the cab wheel well area. Draining condensation into the interior of the cab or onto the occupants, roof or windshield will not be acceptable under any conditions.

The dual evaporator shall be roof mounted to allow service and maintenance without the need to remove interior components or upholstery.

System shall be compatible with R134A refrigerant.

The 12-volt system for the air conditioners shall have first priority to be load managed. The system shall utilize clearly labeled automatic reset-type circuit breakers.

The controls system shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve.

The air conditioning system shall be configured to only operate when the vehicle's engine is running.

The blowers, in both evaporators, shall be in operation whenever the air conditioning system is activated.

Heater-defroster shall have a three-speed electric fan with a minimum output of 720 CFM through the louvers. Six (6) 3" diameter adjustable defroster outlets shall be provided for directing warm air to the windshields. Heater-defroster unit controls shall be illuminated. Water lines from the engine to heater-defroster shall be 5/8" heater hose with readily accessible flexible connections at each end. The water lines to the heater shall have brass shut-off valves mounted on the engine to isolate the heater-defroster unit. The heater hose installation shall not incorporate a copper tube manifold.

The heater/defroster unit shall clear the windshield in half-the-time required by SAE Standards.

A serviceable foam intake filter shall be installed on the rear of the evaporator.

Controls for this HVAC system shall be accessed and controlled through the Class One Ultraview screen located either in the cab overhead or on the dash wing panel, both of which shall be easily accessible by the driver.

ROOF MOUNT CONDENSER

A 12-volt roof top dual condenser shall be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems. The condenser shall be designed with high performance, long life fan assemblies. The fan motors are to be equipped with sealed housings and shaft.

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The condenser and coil design shall include rifled tubing for maximum efficiency. Each coil shall be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness shall include necessary wiring for the clutch circuit as well as a separate power relay circuit.

Mounting design shall enable easy servicing of all components and unit replacement if necessary.

CLIMATE CONTROL SWITCHES

The multiplex system control screen shall contain all controls for the cab HVAC system. The following controls shall be programmed into the control/display: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial.

CAB DEFOGGER FANS

Two (2), eight (8) inch diameter, two-speed, defogger fans shall be provided in addition to the standard windshield defroster.

CIRCULATION FANS

Two (2), eight (8) inch diameter, two-speed circulation fans shall be provided in the rear crew area.

CAB TILT ASSEMBLY

A hydraulic cab lift system shall be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves.

The cab tilt mechanism shall be custom designed for ease of maintenance and consist of two (2) hydraulic cylinders. Hydraulic lines shall be rated at 20,000 PSI burst pressure. The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

Hydraulic cylinders shall be detachable to allow removal of the engine for major service. A remote cable operated mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

The two (2) rear outboard cab latches shall be of the hydraulic pressure release, automatic re-latching type, and provide an automatic positive lock when the cab is lowered. The latch shall not disengage or experience any damage when subjected to a pull apart tensile load of 6,000 lbs. The hydraulic pressure required to unlock the latch shall not exceed 550 PSI. The latch shall withstand 5,000 PSI without leaks or damage and withstand 1,000 continuous cycles of operation under a load of 1,000 lbs at liftoff. The tilt pump shall be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device shall be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

- A "CAB NOT LATCHED" indicator shall be provided in the cab dash-warning cluster.
- A dual switch control system shall be provided for the cab tilt, located on the passenger side of the vehicle or on the optional tether control. System shall consist of a three (3) position toggle switch along with a rubber covered push button switch.

AUXILIARY MANUAL CAB LIFT

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An auxiliary manual cab lift backup system shall be furnished inside the passenger side of the pump enclosure or front compartment for use in the event of total electrical shutdown.

The cab tilt control shall be equipped with an interlock that shall disable the cab tilt system in the event the parking brake is not applied.

CHASSIS FRAME ASSEMBLY

The chassis frame shall be fabricated in its entirety at the manufacturer's facility. This will prevent any split responsibility in warranty or service.

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Frame assemblies that are welded or assembled with "Huck" type fasteners are not acceptable."

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from Domex™ 110,000 PSI minimum yield steel, with a minimum section modulus of 18.396 cu in and a resisting bending moment (RBM) of 2,023,560 inch pounds. The frame rails shall be drilled "together" (back to back) on a frame drilling machine with an internally cooled drill bit in order to minimize the deviation in hole diameter or location. Frames are built for the specific apparatus under construction so that no unnecessary holes or modifications are made to the frame assembly.

The chassis frame assembly, consisting of frame rails, cross members, axles and steering gear(s), shall be finish painted before installation of any electrical wiring, fuel system components, or air system components. All components or brackets fastened to the frame rails shall be cleaned, primed and painted prior to being attached to the frame rails.

***** FRONT BUMPER, EXTENSION & ACCESSORIES *****

PAINTED STEEL FRONT BUMPER

A 12" high, 101" wide, painted steel front bumper shall be provided. The bumper shall be constructed from 3/8" steel, which shall be designed with 45-degree welded corners and a 2" flange on the top and bottom. The ends of the bumper shall be supported by horizontal channels, which shall extend from the frame rails to the sides of the bumper. The color of the bumper shall match the cab and body base color.

***C/S See attached image.

The bumper frame shall be stepped down to allow for additional space for bumper accessories.

BUMPER EXTENSION

The bumper shall be extended 27" with a polished aluminum tread plate gravel shield enclosing the top and ends.

The polished aluminum tread plate gravel shield shall terminate under the top bumper flange.

STORAGE WELL - CENTER

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One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be center mounted between the chassis frame rails. The bottom of the storage well shall have a minimum of four (4) drain holes.

The center front bumper hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

The center storage well shall be equipped with Turtle Tile material to provide drainage and ventilation of equipment in storage well.

CENTER WELL - GENERAL STORAGE

The center storage well shall be utilized for general storage of tools or equipment, the well shall be as large as space allows.

STORAGE WELL - OFFICER SIDE

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be located on the officer side of the bumper extension. The bottom of the storage well shall have a minimum of four (4) drain holes.

The officer side front bumper hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

The officer side storage well shall be equipped with Turtle Tile material to provide drainage and ventilation of equipment in storage well.

OFFICER WELL - GENERAL STORAGE

The officer storage well shall be utilized for general storage of tools or equipment, the well shall be as large as space allows.

- 100' of 1 3/4" hose

REEL STORAGE COVER, FULL WIDTH

A raised tread plate cover shall be provided over the full width of the front bumper. The cover shall be hinged at the bottom rear and shall be held in the open position with two (2) gas shock stay arms. The cover shall be secured in the closed position with two (2) rubber hold down clamps. Two (2) chrome "D" grab handles shall be located on the front face for assisting in opening/closing of the cover.

One (1) Amdor Luma Bar LED strip light shall be mounted to the underside of the lid and wired to a magnetic door switch for auto ON/OFF when the cover is opened.

FRONT TOW HOOKS

Two (2) front painted tow hooks shall be fastened directly to the frame, below the front bumper. The tow hooks shall be fastened with grade 8 bolts and nuts.

FRONT AXLE

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Front axle shall be a Meritor MFS-20-133 A-N, reversed Elliott "I" beam type and include low friction "Easy Steer" bushing technology for maximum steering ease and longer life.

The front axle shall be rated at 20,000 lbs.

FRONT DISC BRAKES

Meritor EX-225 H, 17" disc brakes shall be provided for the front axle. The front brakes shall be full air actuated with automatic slack adjustment.

FRONT SUSPENSION

Front suspension shall be parabolic type front leaf springs. The spring shall be permanently pinned at the front and have a shackle double pinned mounting at the rear.

The front leaf springs shall have a minimum of 3 leaves, a minimum length of 53", and a minimum width of 3-1/2". The capacity at ground shall be 21,500 lbs. All springs shall be of center bolt design. All spring pin joints shall be maintenance free, rubber bushed for vibration reduction and positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

The front suspension system shall be equipped with Monroe, model "Magnum - 70", double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

REAR AXLE

Rear axle shall be a single, Meritor RS-26-185 with a capacity of 27,000 lbs. (Minimum). Axle shall be a single reduction axle with hypoid gearing and oil-lubricated wheel bearings. Oil seals shall be provided as standard equipment.

REAR BRAKES

Brakes shall be "S" Cam, 16-1/2" x 8 5/8" size and shall be full air actuated with automatic slack adjusters.

REAR AXLE TOP SPEED

The rear axle/s shall be geared for a vehicle top speed in accordance with NFPA sections 4.15.2 and 4.15.3.

Units with GVWR over 26,000 pounds shall be limited to 68 mph. If the combined tank capacity is over 1250 gallons of foam and water or the GVWR is over 50,000 pounds, the vehicle top speed shall be limited to 60 mph or the fire service rating of the tires, whichever is lower.

REAR SUSPENSION

The rear suspension shall be Reyco 79KB-29K leaf-type with a 28,000 lb rating. The assembly shall consist of a multi-leaf and parabolic taper leaf with cast spring hanger brackets.

The suspension rating shall be designed to match or exceed the rear axle rating.

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***** AIR & BRAKE SYSTEM *****

BRAKE SYSTEM

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1901 current edition shall be installed. It shall be direct air type with dual air treadle in the cab. The system shall be powered by an engine mounted, gear driven air compressor protected by a heated air dryer.

The air system shall be plumbed with reinforced, air brake tubing/hose in conformance to SAE J 844-94, Type B and U.S.D.O.T. standards. The compressor discharge shall be plumbed with stainless steel braided hose lines with a Teflon lining. Eaton Synflex Eclipse Air Brake tubing shall be run along the inside frame rails and connected with push to connect type fittings that meet or exceed all industry standards. All Synflex shall be secured with non-conductive, corrosion resistant strapping mounted with standoff fasteners.

Cord reinforced rubber hose lines with brass fittings shall be installed from the frame rails to axle mounted air connections.

The air system shall provide a rapid air build-up feature and low-pressure protection valve with light and buzzer, designed to meet the requirements of NFPA 1901, current edition.

ABS SYSTEM

An Anti-Skid Braking System (ABS) shall be provided to improve braking control and reduce stopping distance. This braking system shall be fitted to all of the axles. All electrical connections shall be environmentally sealed, water, weatherproof, and vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel shall transmit wheel speed data to an electronic processor which shall sense approaching wheel lock causing instant brake pressure modulation up to 5 times per second in order to prevent wheel lockup. Each wheel shall be individually controlled.

To improve service trouble shooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started. A dash-mounted light shall go out once the vehicle has attained 4 mph after successful ABS start-up. To improve field performance; the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, the defective circuit shall revert to normal braking action. A warning light shall signal malfunction to the operator. The system shall consist of a wheel mounted toothed ring, sensor, sensor clip, electronic control unit and solenoid control valve.

The sensor clip shall hold the sensor in close proximity to the toothed ring. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion resistant and protected from electromagnetic interference. The electronic control unit shall monitor the speed of each wheel. A deviation shall be corrected by cyclical brake application and release. If a malfunction occurs, the defective circuit shall signal the operator and the malfunctioning portion of the system shall shut down. The system shall be installed in a diagonal pattern for side-to-side control. The system shall insure that each wheel is braking to optimum efficiency up to 5 times a second.

The system shall also control application of the auxiliary engine exhaust or drive line brakes to prevent wheel lock.

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This system shall have a three (3) year or 300,000 mile parts and labor warranty as provided by Meritor Wabco Vehicle Control Systems.

BRAKE AIR RESERVOIRS

There shall be a minimum of three (3) air reservoirs installed in conformance with best automotive practices.

An additional 1127 cu. in. air reservoir shall be provided for the accessory air outlet.

Reservoir capacity total shall be a minimum of 5820 cubic inches.

The air reservoirs shall be color coded to match the air lines for easy identification, ease of maintenance and troubleshooting. The reservoirs shall be painted the following colors:

- | | |
|---------------------|--------|
| • Wet Tank | Black |
| • Primary Tank | Green |
| • Secondary Tank | Blue |
| • Auxiliary Tank(s) | Yellow |

For ease of daily maintenance, each air system reservoir shall be equipped with a brass 1/4 turn drain valve.

AIR DRYER SYSTEM

A Rockwell/Wabco System Saver 1200 heated air dryer shall be furnished. An automatic moisture ejector on the primary shall also be furnished.

AIR LINES

The entire chassis air system shall be plumbed utilizing reinforced, Synflex air lines, which shall be equipped with quick release type fittings. All of the airlines shall be color coded to correspond with an air system schematic and shall be adequately protected from heat and chafing.

AIR COMPRESSOR

Air compressor shall be a Wabco brand, minimum of 18.7 cubic feet per minute capacity. Air brake system shall be the quick build up type. The air compressor discharge line shall be stainless steel braid reinforced Teflon hose.

A pressure protection valve shall be installed to prevent the use of air horns or other air operated devices should the air system pressure drop below 80 psi (552 kPa).

The chassis air system shall meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system. This system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

BRAKE TREADLE VALVE

A Bendix dual brake treadle valve shall be mounted on the floor in front of the driver. The brake control shall be positioned to provide unobstructed access and comfort for the driver.

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PARKING BRAKE

Parking brake shall be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control shall be mounted on the cab center instrument panel, offset toward the driver. A red indicator light shall be provided in the driver dash panel that shall illuminate when the parking brake is applied.

AIR COMPRESSOR

Kussmaul model #091-9B-1, 120 volt air compressor shall be provided to help maintain the chassis air system when connected to the electrical shoreline. The compressor shall be equipped with a 1/8 HP motor and capable building the chassis air system up to 100 psi. The mounting location of the pump shall be behind the driver's seat.

A Kussmaul # 091-150-115 A.C. Auto Pump timer shall be installed to protect the Auto Pump from high temperatures and wear rates if a large air leak occurs on the air system. The timer shall limit the duty cycle of the 120 volt pump to a one (1) hour running time followed by a half hour cool down period.

A Kussmaul # 091-9-090 Auto Drain ACHP shall be installed to protect the Auto Pump from built up moisture.

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 12.25" ten stud, hub piloted steel disc type, painted job color.

The steel disc front wheels shall be provided with bright nut covers and hub caps.

The front tires shall be Continental 385/65R22.5 "20 Ply" tubeless radial HTR2 wide base highway tread. The tires shall be fire service rated up to 21,230 lbs and shall have a top speed of 68 mph when inflated to 130 psi.

Fire Service Rating means operations not to exceed one hour loaded travel at maximum speed, with at least a one hour cool down prior to another loaded run.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

REAR WHEELS & TIRES

The rear wheels shall be 22.5" x 8.25" ten stud, hub piloted steel disc type, painted job color.

The single rear axle steel disc wheels shall be provided with bright nut covers and hub caps.

The rear tires shall be Continental 12R22.5 "16 Ply" tubeless radial HSC1 traction tread. The tires shall be fire service rated up to 29,020 lbs and shall have a top speed of 68 mph when inflated to 120 psi.

Fire Service Rating means operations not to exceed one hour loaded travel at maximum speed, with at least a one hour cool down prior to another loaded run.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

TIRE PRESSURE MONITORING DEVICES

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Each tire shall be equipped with an LED tire alert pressure management system (Vecsafe equal) that shall monitor tire pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire.

The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 8 psi.

***** ENGINE, TRANSMISSION & ACCESSORIES *****

ENGINE

Engine shall be a Cummins, Model L9 450, diesel, turbo-charged, electronically controlled, per the following specifications.

• Max. Horsepower	450 HP @ 2100 RPM
• Governed Speed	2200 RPM
• Peak Torque	1250 lb. ft. @ 1400 RPM
• Cylinders	Six (6)
• Operating Cycles	Four (4)
• Bore & Stroke	4.49 x 5.69 in.
• Displacement	543 cu. in.
• Compression Ratio	16.6:1
• Governor Type	Limiting Speed
• Drive line Size	1710

Engine oil filters shall be engine manufacturers branded or approved equal. Engine oil filters shall be accessible for ease of service and replacement.

A fuel/water separator shall be provided.

ENGINE CHASSIS CERTIFICATION

The engine shall be installed in accordance with engine manufacturer's instructions. KME shall be able to furnish proof of engine installation approval by the engine manufacturer.

COOLING/RADIATOR

Radiator shall be brass with bolted steel top and bottom tanks. The cooling system shall be designed for a maximum of fifteen (15) PSI operation. There shall be a sight glass in the radiator to check the coolant level without removing the radiator cap. The core construction shall be tube and fin with three (3) tube rows, 273 total core tubes, and fourteen (14) fins per inch.

Extended life engine coolant shall provide anti-freeze protection to -30° F. The mixture shall be per the engine manufacture's specifications.

Core area to be a minimum of 1375 square inches (39 H x 35.25W).

The engine cooling system shall have an inline coolant filter that shall have a shut off valve for ease of maintenance.

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The engine cooling system shall be certified by the engine manufacturer to meet cooling index requirements for a minimum ambient temperature or 110-degrees Fahrenheit.

TRANSMISSION COOLER

A shell and tube transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature. The cooler shall have an aluminum shell and copper tubes. The cooler shall be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil. No brazed, soldered, or welded connections shall be used to separate the coolant from the oil.

RADIATOR SKID PLATE

The radiator installation shall include a heavy-duty radiator skid plate to protect the radiator from debris or obstructions under the chassis. The skid plate shall be designed so the angle of approach is not affected.

CHARGE AIR COOLER

The charge air cooler shall be constructed of aluminum with cast aluminum side tanks. The cooler shall have a frontal core size of 957 square inches, seven (7) fins per inch, and forty eight (48) core tubes.

The charge air cooler shall be mounted directly ahead of the radiator and to the radiator headers. Rubber isolators shall be used at the mounting points to reduce transmission of vibrations.

Where applicable, the charge air cooler pipes shall be constructed of appropriately sized aluminized steel tubing with 0.06" wall thickness and formed hose barbs. The connections between these pipes, the engine and charged air cooler, shall be made using high temperature silicone hoses rated for use in temperature up to 500°F, and heavy duty constant tension T-Bolt spring hose clamps. These connections shall adequately allow for movement of the engine relative to the charged air cooler.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy duty fan, installed on the engine and include a shroud.

The fan shall be equipped with an air operated clutch fan, which shall activate at a pre-determined temperature range.

Recirculation shields shall be installed to ensure that air which has passed through the radiator is not drawn through it again.

FAN SWITCH - OVERRIDE

A switch shall be provided on cab dash to operate the engine cooling fan, if needed.

FAN SWITCH - OVERRIDE (PUMP -PANEL)

A switch shall be provided on pump panel to operate the engine cooling fan, if needed.

The fan will also automatically activate when the air conditioner is turned on and parking brake is activated/applied.

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COOLANT HOSE AND PIPING

All coolant piping shall be constructed of appropriately sized powder coated steel tubing with 0.06" wall thickness and formed hose barbs. All connections between coolant pipes and chassis components shall be made using appropriately sized silicone hoses or elbows, rated for use in temperatures ranging from -60°F to +350°F, and appropriately sized constant torque hose clamps. These connections shall be minimal in number to reduce the number potential leak points, and shall adequately allow for movement of the engine relative to chassis mounted components. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

HEATER HOSES

Premium Goodyear Hi-Miler® blue heater hoses shall be furnished for the heater system. The Hi-Miler® hose shall have a core of black Versigard (EPDM) with spiral Flextan reinforcement and blue Versigard coating. All heater hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

ENGINE BRAKE

An engine compression brake shall be furnished for increased braking capabilities. Controls shall be as provided by the engine manufacturer and shall be activated by releasing the throttle pedal to the idle position.

The engine compression brake shall have dash mounted control switches to turn the brake on or off as well as to control the operational level of the brake.

The engine brake shall be wired in such a manner so as to illuminate the chassis brake lights when the engine brake is engaged and operating.

The engine brake shall be interlocked with the PTO operation and shall automatically disengage any time the apparatus is operating with the PTO active.

ENGINE FAST IDLE

A fast idle for the electronic controlled engine shall be provided. The fast idle shall be controlled by an ON/OFF switch on the dash.

An electronic interlock system shall prevent the fast idle from operating unless the transmission is in "Neutral" and the parking brake is fully engaged. If the fast idle control is used in conjunction with a specified engine/transmission driven component or accessory, the fast idle control shall be properly interlocked with the engagement of the specified component or accessory.

AIR CLEANER

An engine air cleaner shall be provided. The air cleaner shall include a dry type element and shall be installed in accordance with the engine manufacturer's recommendations. The air cleaner shall be located to the rear of the engine, with streamline air pipes and hump hose connections from the inlet to the air cleaner and from the air cleaner to the turbo. The air cleaner shall be easily accessible when the cab is tilted. The air cleaner shall be plumbed to the air intake system that shall include a self sealing connection between the cab and air cleaner assembly to allow the cab to be tilted.

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To draw fresh clean air, the intake for the air cleaner shall be on the side of the cab on the driver's side. The inlet shall be a minimum of 41" above the ground to allow the vehicle to navigate through water without any part of the air intake system being below the frame rail, preventing any type of water intake.

SPARK ARRESTOR

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers. The spark arrestor housing must be easily accessible when the cab is tilted.

ACCELERATOR CONTROL

A floor mount accelerator pedal shall be installed on the floor in front of the driver. The pedal shall be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

REMOTE THROTTLE CONTROL HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection to required throttle control harnesses. The harness shall contain necessary connectors for a pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate "Pump Engaged" and "OK to Pump" indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

TRANSMISSION

An Allison World Transmission, Model 3000 EVS electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

- Max. Gross Input Power 450 HP
- Max. Gross Input Torque 1250 lb. ft.
- Input Speed (Range) 2000- 2800 RPM
- Direct Gear (Pumping) 4th (Lock-up)

Transmission installation shall be in accordance with the transmission manufacturer's specification. The transmission shall be readily and easily removable for repairs or replacement.

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One (1) PTO opening shall be provided on both the left and right side of the converter housing (positions four (4) o'clock and eight (8) o'clock).

The transmission shall be calibrated for five (5) forward gears and one (1) reverse gear. Each gear shall have the following ratios:

- First 3.49:1
- Second 1.86:1
- Third 1.41:1
- Fourth 1.00:1
- Fifth 0.75:1
- Reverse -5.03:1

TRANSMISSION SHIFT SELECTOR

An illuminated, touch-pad type shift control shall be mounted in the cab, convenient to the driver. Shift control shall be approved by the transmission manufacturer.

TRANSMISSION OIL LEVEL SENSOR

The transmission shall be equipped with the oil level sensor (OLS); this sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level.

PARK TO NEUTRAL

The transmission, upon application of the parking brake, shall automatically shift into neutral.

PRESELECT PROGRAMMING

The transmission shall have Allison Pre select enabled to automatically downshift when the secondary engine brake is active.

The transmission shall be programmed at the factory to automatically downshift to 2nd gear.

This feature shall be enabled/disabled with the main on/off switch for the engine brake.

SYNTHETIC TRANSMISSION FLUID

Castrol "TRANSYND" or an equivalent synthetic TES 295 transmission fluid shall be utilized to fill the 3000 EVS transmission.

DRIVE LINES

Drive lines shall be Dana (Spicer) 1710 heavy duty series or equal, with "glide coat" splines on all slip shafts. The chassis manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The manufacturer shall provide proof of compliance with all drive shaft manufacturer's standards and specifications.

Where applicable, the universal joints shall be the half loop style joints.

DIESEL EXHAUST FLUID TANK

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A five (5) gallon diesel exhaust fluid (DEF) tank shall be provided and installed. The tank shall be mounted in the area of the battery box and shall be accessible through a door in the crew area step well.

The tank shall include an internal heater that will be fed by engine coolant directly from the engine block to ensure it is always kept at the proper temperature per EPA requirements. The tank shall include a temperature sensor to control the flow of the engine coolant from the heater valve to the DEF tank.

A DEF fluid level sensor shall be provided with the DEF tank and connected to the level gauge on the dashboard.

EXHAUST SYSTEM

The exhaust system shall be installed in accordance with the engine manufacturer's requirements and meet all Environmental Protection Agency and State noise level requirements. Exhaust system components shall be securely mounted and easily removable.

The diesel particulate filter/muffler shall be fabricated from stainless steel and of a size compatible with the engine exhaust discharge.

Exhaust tubing shall be a minimum of 16 gauge stainless steel from the turbocharger on the engine to the inlet of the diesel particulate filter. Any flexible exhaust tubing shall be HDT stainless steel type. To minimize heat build-up, exhaust tubing within the engine compartment shall be wrapped with an insulating material. Exhaust shall be wrapped from the turbocharger to the entrance of the muffler. Material shall be held in place with worm gear type clamps.

An exhaust diffuser shall be provided to reduce the temperature of the exhaust as it exits the tailpipe.

Separate "regeneration" enable and prohibit switches shall be provided under the dash board on the driver's side. Each switch shall be provided with a spring loaded protective cover and shall be clearly marked as to function.

SELECTIVE CATALYTIC REDUCTION (SCR)

The vehicle shall be equipped with SCR technology that uses a urea based diesel exhaust fluid (DEF) and a catalytic converter to significantly reduce oxides of nitrogen (NOx) emissions.

The SCR system shall reduce levels of NOx (oxides of nitrogen emitted from engines) by injecting small quantities of diesel exhaust fluid (DEF) into the exhaust upstream of a catalyst, where it vaporizes and decomposes to form ammonia and carbon dioxide. The ammonia (NH₃), in conjunction to the SCR catalyst, converts the NOx to harmless nitrogen (N₂) and water (H₂O).

The exhaust tailpipe extending from the SCR catalyst to the side of the vehicle shall be constructed from 16-gauge aluminized steel tubing. The exhaust discharge shall be on the officer side of the apparatus forward of the rear axle.

PROVISIONS FOR PLYMOVENT EXHAUST EXTRACTION SYSTEM

The exhaust outlet shall be straight pipe, forward of the rear axle, terminating minimum 6" forward of rear tire, minimum 2.5" below rub rail/body, and flush with outboard of rub rail/body to connect with a Plymovent ventilation system.

**** FUEL SYSTEM ****

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FUEL TANK

Fuel tank shall be a minimum of fifty (50) gallon capacity. It shall have a minimum fuel filler neck of 2" ID and 1/4 turn fill cap. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from hot rolled, pickled and oiled steel. Provisions for an additional feed line and fuel level float shall be provided for future use.

The fuel tank shall be installed behind the rear wheels between the frame rails.

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

The fuel tank shall be able to withstand a longitudinal acceleration of -23.0g at 0.166 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

FUEL TANK STRAPS

The straps supporting the diesel fuel tank shall be made of Type 304L stainless steel with grade 8, zinc coated steel hardware.

The fuel tank mounting straps shall utilize dense rubber between the straps and the fuel tank to prevent chaffing.

All fuel lines shall be provided as recommended by the engine manufacturer. The lines shall be sized to meet engine manufacture's requirements, and shall be carefully routed and secured along the inside of the frame rails.

DUAL FUEL LINE SHUT-OFF VALVES

A fuel line shut-off valve shall be provided on both the inlet and outlet side of the primary fuel filter to allow for easy removal of the filter.

The valves shall be labeled "Fuel Shut-Off". No reserve feature shall be included in the tank.

FUEL TANK SERVICEABILITY PROVISIONS

An additional eight feet of fuel line shall be provided. The line shall be coiled and secured above the fuel tank to improve serviceability of the tank.

FUEL FILTER/WATER SEPARATOR

A fuel filter/water separator shall be provided in the fuel system. A "water in fuel" indicator shall be provided on the dash.

SECONDARY ELECTRIC FUEL PUMP

In addition to the primary fuel pump, a secondary electric fuel pump for re-priming shall be furnished in the main fuel line. A labeled control switch shall be provided on the main dash panel.

FUEL POCKET

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A fuel fill shall be provided in the left side rear wheel well area. A Cast Products heavy duty cast aluminum spring loaded hinged fill door shall be provided.

A label indicating "Ultra Low Sulfur Diesel Fuel Only" shall be provided adjacent to the fuel fill.

DUAL POWER STEERING

A dual power steering system shall be provided utilizing a Sheppard model #M110 main steering gear on the driver side of the chassis and a Sheppard model #M90 steering gear on the officer side of the chassis.

The power steering gear on the officer side of the chassis shall increase performance in turning the officer side wheel assembly, reducing loads and forces on the main gear and components.

The steering system shall be designed to maximize the turning capabilities of the front axle no matter the rating and tire size. The use of a power assist cylinder on the officer side of the chassis is NOT ACCEPTABLE on front axles of this capacity.

The system shall be designed utilizing an engine driven hydraulic pump, with a maximum operating pressure of 2000 PSI. Steering design shall permit a maximum of 5.6 turns from stop to stop. Steering system components shall be mounted in accordance with the steering gear manufacturer's instructions.

STEERING COLUMN

The steering column shall be a "Douglas Autotech" tilt and telescope column. A lever mounted on the side of the column shall control the tilt and telescope features.

The steering shaft from the column to the miter box shall have a rubber boot to cover the shaft slip and a second rubber boot to seal the passage hole in the floor.

There shall be a self-canceling lever that shall control the following functions:

- Left and right turn signals
- High beam activation
- Two speed with intermittent windshield wiper control
- Windshield washer control

STEERING WHEEL

The steering wheel shall be a two (2) spoke, vinyl padded, minimum 18" diameter, with a center hub mounted horn button.

ROAD SAFETY KIT

A road safety kit shall be furnished with the following equipment:

- 2 1/2 lb. B-C fire extinguisher
- Triangle safety reflectors.

***** CHASSIS/BODY ELECTRICAL & ACCESSORIES *****

CHASSIS ELECTRICAL SYSTEM

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All electrical wiring in the chassis shall be GXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers shall contain thermal automatic reset breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease in custom construction.

The power distribution centers are function oriented. The first is to control major truck function. The second shall control center to overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers will also have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces shall be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points shall be mounted in accessible locations. Complete chassis wiring schematics shall be supplied with the apparatus.

WIRING HARNESS DESCRIPTION

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. Wiring shall be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

The covering of harnesses shall be moisture resistant loom with a minimum rating of 289° Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable shall have a minimum rating of 289° Fahrenheit.

All circuits shall conform to SAEJ1292. All circuits must be provided with low voltage over current protective devices.

All exposed electrical connections will be coated with "Z-Guard" to prevent corrosion.

DIRECT GROUNDING STRAPS

Direct grounding straps shall be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

All exposed electrical connections shall be coated with "Z-Guard 8000" to prevent corrosion.

EMI/RFI PROTECTION

The apparatus shall incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

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The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes.

In order to fully prevent the radio frequency interference the purchaser may be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

12 VOLT ELECTRICAL SYSTEM TESTING

The apparatus low voltage electrical system shall be tested and certified by the manufacturer. The certification shall be provided with the apparatus. All tests shall be performed with air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. Before each test, the batteries shall be fully charged.

TEST #1-RESERVE CAPACITY TEST

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

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

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

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of less than 11.7 volts DC for a 12 volt system, for more than 120 seconds, shall be considered a test failure.

LOW VOLTAGE ALARM TEST

Following completion of the preceding tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

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At time of delivery, documentation shall be provided with the following information:

- Documentation of the electrical system performance test
- A written load analysis of the following;
- Nameplate rating of the alternator
- Alternator rating at idle while meeting the minimum continuous electrical load
- Each component load comprising the minimum continuous electrical load.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

ELECTRICAL MANAGEMENT SYSTEM

A Class 1 ES-Key Electrical Management System shall be utilized on the chassis for all functions applicable. The system shall consist of the following components:

A Modem with a RS232 computer interface and standard telephone jack used to not only program the multiplex system but also serve as a factory direct gateway into the vehicle from any Class 1 multiplex authorized service facility.

A Universal System Manager (USM), which acts as the main controlling component of the multiplexing system shall be provided and factory programmed to DOT, NFPA, SAE, the manufacturer and Township of Berkeley, Bayville Fire Company specifications. The programming shall be done by the manufacturer's engineering department. The ES-Key system installation shall comply with SAE J 551 requirements regarding Electromagnetic and Radio Frequency interference (EMI, RFI), as well as utilize components and wiring practices that insure the system is protected against corrosion, excessive temperatures, water, excessive physical, and vibration damage by any equipment installed on the vehicle at the time of delivery.

A series of Multiplexing Input/Output Modules shall be installed. The Input/Output modules shall permit the multiplexing system to reduce the amount of wiring and components used as compared to non-multiplexed apparatus. These modules shall vary in I/O configuration, be waterproof allowing installation outside of enclosed areas and shall possess individual output internal circuit protection. The modules shall also have three status indicators visible from a service persons vantage point that shall indicate the status of the module. In the event a load requires more than 7.5 AMPS of operating current, the module shall activate a simple relay circuit integral to any of the 3 dillbox assemblies installed in the cab.

Diagnostic software shall be provided to download data from the on board ES-KEY system. This software shall have the ability to view system input/output (I/O) information, and include a connection from a computer to the vehicle.

A Class1 UltraView # UV450 4.3" color transmissive TFT display for monitoring critical apparatus and engine information shall be provided and installed. The displays shall be CAN based utilizing J1939 message protocol. The display shall utilize a bonded LCD display screen for optimal visibility in direct sunlight.

The display shall be fully configurable and when used in conjunction with the Class1 ES-Key system and shall be custom programmed to control multiple apparatus functions and perform onboard apparatus and engine diagnostics.

ADDITIONAL CLASS-1 ULTAVIEW 450 DISPLAY ON OFFICER SIDE OF CAB

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An additional Class 1 UltraView 450 display shall be provided and installed on the officer side of the cab. The second display shall have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

INTERLOCK INTERFACE MODULE

A Vocation Module, which is the interface between the multiplexing system and the pump system shall be provided. This module shall serve as the interface between the operator, engine, transmission and pumping system. The module shall be installed under the driver's side dash, in a sealed enclosure that shall possess green indicating LEDs that shall indicate to service personnel the interlock state of the apparatus. In the event of a multiplexing error involving pump operation can be activated to ensure reliable pumping operations at ALL times. In addition to controlling pump function, this vocation module shall be able to provide automatic and/or manual activation of engine "Fast Idle", to maintain adequate alternator output and thus, chassis voltage.

CHASSIS DIAGNOSTICS SYSTEM

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

The diagnostic system shall include the following:

- A single port to monitor the engine, transmission and ABS system and diagnostics of the roll sensor (if applicable)
- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes)
- Allison Transmission Codes (through touch pad shifter)

VOLTAGE MONITOR SYSTEM

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

12 VOLT SEQUENCER

A sequencer shall be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation shall 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.

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

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

Rear of cab Air-Conditioning and Heat shall be load managed.

ELECTRICAL HARNESS REQUIREMENT

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

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - 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 J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A.

For increased reliability and harness integrity, harnesses shall be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes is never allowed at the manufacturer.

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

- All holes made in the roof shall be caulked with silicon. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.

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- Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall 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 shall have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas shall have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.
- Cab and crew cab harnessing shall not be routed through enclosed metal tubing. Dedicated wire routing channels shall be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab shall allow for easy routing of additional wiring and easy access to existing wiring.
- All standard wiring entering or exiting the cab shall be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

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

- SAE J 1127 - Battery Cable
- SAE J 561 - Electrical terminals, eyelets and spade type
- SAE J 562 - Nonmetallic loom
- SAE J 836 A - Automotive metallurgical joining
- SAE J 1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
- NFPA 1901 - Standard for automotive fire apparatus.

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

- Splices shall not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be marked red in color. All negative battery cables shall be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.
- An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

AUTOMATIC HIGH IDLE

This feature automatically increases engine rpm and the available alternator output current. Chassis voltage is monitored at all times by the ES-Key system and when it drops to or below 12.8VDC for more than 10 seconds, the hi-idle output of the ES-Key system is activated. As long as the proper interlocks are present; transmission in NEUTRAL, park brake SET, and additional drive line assessors (Pump & PTO's) are NOT engaged; the engine rpm's shall increase to a specified set point. At any time, the ES-Key system's hi-idle command can be canceled by a loss of any of the specified required interlocks. Also at any time, the ES-Key system's hi-idle command can be paused for 30 seconds by a

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foot brake depression or momentary start switch activation (in the situation where the engine has been off for some time). The ES-Key system's automatic hi-idle command shall remain active until the chassis voltage rises above 12.8VDC and remains there for 3 minutes.

When the hi-idle command is requested by the ES-Key system due to the lower chassis voltage described, the ES-Key dashboard display shall read "Auto Hi-Idle" to clearly indicate to the apparatus operator that the engine is at a, or shall go to, a hi-idle state. When all interlocks are preset and the engine is at a hi-idle state, the red "FAST IDLE" indicator in the dashboard shall illuminate.

ALTERNATOR

There shall be a Delco Remy Model 55SI, 430 amp brushless, serpentine belt driven alternator. The brushless design of the 55SI transfers magnetic fields between the rotor and stator air-gap without brushes.

The alternator installation shall be designed to provide maximum output at engine idle speed, by using "Remote Sense" in order to meet the minimum continuous electrical load of the apparatus as required.

The alternator shall carry a 3 Year/Unlimited Mile warranty.

BATTERY SYSTEM

Six (6) Exide #EXP1000-31D, maintenance free batteries shall be provided. Each battery shall be rated at 1000 CCA at 0° F and shall have a reserve capacity of 200 minutes.

Wiring for the batteries shall be 4/0 welding type dual path starting cables for SAEJ541.

BATTERY STORAGE

Batteries shall be securely mounted in fixed 3/16" GR50 steel trays located on each side of the chassis frame. Complete access shall be provided when the cab is fully tilted. Batteries shall be mounted on non-corrosive matting material.

The battery tray shall be able to withstand a longitudinal acceleration of -46.5g at 0.246 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

BATTERY BOX COVER (NO HAND HOLES)

The battery box shall be overlaid with an "L" shaped, polished aluminum tread plate cover. This cover shall protect the batteries from road spray, snow and road debris. The cover of this box shall be easily removable for inspection, testing and maintenance of the batteries.

BATTERY DISCONNECT SWITCH

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty master disconnect switch. The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

BATTERY JUMPER STUDS

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A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) shall be provided to allow the battery system to be jump started or charged from an external source. The studs shall be located on the bottom of the battery box on the driver's side of the chassis. Each stud shall be equipped with both a rubber protector cap and a 2" square non-conductive plate to prevent accidental shorting.

120 VOLT SHORELINE CONNECTION - "SUPER" AUTO EJECT

One (1) Kussmaul "Super" Auto Eject model 091-55-20-120, automatic, 120 volt, 20 amp shoreline disconnect shall be provided for the on board, 110 volt battery charging systems.

The disconnect shall be equipped with a NEMA 5-20 P male receptacle, which shall automatically eject the shoreline when the vehicle starter is energized. The mating connector shall be included with the auto eject and shall be provided as loose equipment. A label shall be provided indicating voltage and amperage ratings.

SHORELINE POWER INLET PLATE

A shoreline power receptacle information plate shall be permanently affixed at or near the power inlet. The plate shall indicate the following:

- Type of Line Voltage
- Current Rating in Amps Power Inlet Type (DC or AC).

The Kussmaul auto-eject connection shall be equipped with a Yellow weatherproof cover.

The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door in a pre-determined location by KME.

BATTERY CHARGER

A ProMariner, ProNautic 1240P, fully automatic battery charger shall be provided for maintaining the vehicle battery system. The charger shall feature a four (4) stage automatic charging system that shall extend the battery life and usage with multi-stage charging featuring a fast charge and a float/maintenance mode. A LED status center, built into the charger, shall provide at-a-glance status of fast charge, conditioning, ready (float/maintenance) and battery type selection. Output current shall be 40 amperes @ 12 volt DC.

TRANSFER SWITCH

An automatic power relay shall be installed to allow interior 120 volt accessories to be powered by the 120 volt shoreline or the generator. The interior accessories to be powered by the shoreline shall be wired through a separate sub-panel breaker box. This shall allow for a continuous power supply to the interior accessories while the apparatus is parked in the station. The maximum load for the transfer / relay shall be 20 amps at 120 volts.

OUTLET STRIP

One (1) 3' long outlet strip shall be installed on the rear of the doghouse. Each outlet strip shall have four (4) duplex household receptacles.

EMERGENCY/AUXILIARY SWITCHES

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The cab shall be designed with multiple areas for component switching within easy reach of the driver and or officer. This switch package shall separate the emergency / auxiliary electrical functions from the regular chassis functions. A minimum of twenty one (21) programmable CAN Bus Eaton model #E33 switches with integral indicator lights shall be provided.

Twelve (12) of switches shall be located on a sloped panel above the above the driver's position for warning lights and auxiliary controls. A master warning switch shall be provided, which shall allow pre-setting of emergency light switches and shall have a red integral indicator light.

Fifteen (15) additional switches shall be located on the lower switch panel/s between the driver and officer for auxiliary controls.

Twelve (12) of switches shall be located on a sloped panel above the above the officer's position for warning lights and auxiliary controls.

All switches, (other than the master switch), shall have switch function labeling and an integral indicator light.

"LED" CAB INTERIOR LIGHTING

Four (4) Whelen # 60CREGCS, 6" round, interior LED combination red/white dome lights shall be furnished in the cab, two (2) in the forward section and two (2) in the rear crew section. Each dome light shall have individual switches to control the red or white LEDs. Each dome light shall also activate when the respective, adjacent cab door is opened.

INNER CAB DOOR LED FLASHERS

One (1) Weldon 16" LED door warning lamp shall be provided on the inside door panel of each cab door. The light shall be mounted on the door's lower scuff plate and shall be activated when the respective door is opened. Each light shall be furnished with a clear lens and amber led's.

INNER DOOR STRIP FLASHER PROTECTION

The inner door mounted LED flashers will have an aluminum "C" channel protection plate installed on each door. The LED light strip will be installed inside of the "C" channel.

AM/FM/CD IN CAB

A dealer supplied AM/FM/CD player with 4 speakers will be must be provided and installed by the body builder.

"DO NOT MOVE APPARATUS" WARNING LIGHT

A 1" round, red flashing warning light with an integral audible alarm shall be functionally located in the cab to signal when an unsafe condition is present; such as an open cab or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device that may be opened, extended or deployed and might cause damage to the apparatus if it is moved.

This light shall be activated through the parking brake switch to signal when the parking brake is released. This light shall be labeled "DO NOT MOVE TRUCK".

12 VOLT POWER PORT NEAR DRIVER

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One (1) 12 volt power port accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The port(s) shall be located as directed near the driver's seating position for devices such as cellular phones.

12 VOLT POWER PORT NEAR OFFICER

One (1) 12 volt power port accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The port(s) shall be located as directed near the officer's seating position for devices such as cellular phones.

12 VOLT ACCESSORY CIRCUIT - CAB DASH

One (1) dedicated circuit; 12 volt, 40 Amp, power and ground on 3/8 stud and fused at battery shall be provided in the cab dash. The circuit shall be for future installation of radios or accessories.

BLUE SEA FUSE BLOCK - 12 CIRCUIT IN REAR CREW AREA

A Blue Sea 5026B, 12 circuit fuse block, shall be installed behind the officer's seat. This block has a maximum amperage of 100 Amps per block and 30 Amps per circuit.

MULTI - USE POWER POINT IN REAR OF CAB

A Mobile Vision multi-use power point with built in two (2) usb ports, and two (2) 12 volt sockets shall be installed in the rear of the cab on the back of the engine enclosure. This shall be capable of up supplying the USB ports with up to three (3) amps and have a 15 amp fuse for overall protection.

FEDERAL SIGNAL DUAL CAMERA SYSTEM

A Federal Signal model # CAMSET70-NTSC-4B rear vision camera system shall be provided to allow the driver to visually see the rear of the apparatus while in the cab. The system shall include a Federal 7.0" flat panel LCD color monitor mounted adjacent to the driver and a Federal rear vision color camera that shall be mounted at the rear of the vehicle. The system shall also feature a microphone on the camera and speaker built into the monitor.

In addition to the rear vision camera, a Federal model# CAMCCD-SIDENTSC side mounted camera shall be mounted on the officer side of the cab.

The cameras shall be wired as follows:

- The side vision camera shall automatically activate when the officer side turn signal is activated.
- The rear vision camera shall automatically activate when the chassis transmission is placed in reverse.

REAR CAMERA GUARD

One (1) formed aluminum diamond plate shield shall be provided and mounted over the rear view camera to protect it from being damaged.

The monitor for the rear vision system shall be mounted ceiling of the cab in easy view of the driver.

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HEADLIGHTS CLUSTER

Two (2) dual, Peterson LED headlight modules with a bright finish bezel shall be furnished, one (1) each side, on the front of the cab. Each head light module shall incorporate an individual LED low beam and a LED high beam headlight. High beam actuation shall be controlled on the turn signal lever.

HEADLIGHT POSITION

To minimize glare from the headlights on the front bumper storage well cover, the headlights shall be mounted in the upper position on the front of the cab. The front warning lights and turn signal lights shall be located in lower position.

DAYTIME RUNNING LIGHTS

The chassis head lights shall have integrated circuitry to actuate the low beam headlights at a maximum of 80 percent of capacity whenever the chassis engine is running.

The daytime running lights shall be interlocked with the parking brake.

UPPER LIGHT MODULE

Two (2) Whelen M6* super LED light heads shall be provided, one (1) in each side dual light module, above the headlights, in matching chrome plated bezels.

Each light head shall be equipped with red LEDs and a colored lens.

An individual control switch shall be provided on the cab switch console, which shall be wired through the load management system to prevent excessive amperage draw.

The lights noted above shall be provided in addition to the NFPA required, minimum optical warning light package.

The NFPA required, Zone "A" lower warning lights shall be incorporated into each side dual light module noted above.

ARROW TURN SIGNALS

Two (2) Whelen M6T arrow shaped, amber LED turn signals shall be provided in chrome plated housings, mounted one (1) each side between the windshield and the dual light modules.

DOT MARKER LIGHTS AND REFLECTORS

Five (5) DOT approved Optronics model # MCL13 Light Emitting Diode (LED) cab marker lamps shall be mounted on the front upper edge of the cab, above the windshield.

Optronics Model MCL48 amber LED marker lights with chrome bezel shall be provided on the side of the cab behind the front cab doors, one (1) each side.

Optronics model MCL82RB red LED marker lights with integral reflectors shall be provided at the lower side rear, one (1) each side.

Optronics Model #STL71AMB yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side if the apparatus is 30' long or longer.

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One (1) Truck-Lite #60703 chrome cover shall be provided for each intermediate turn light.

Optronics MCL65 red LED clearance lights shall be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Optronics MCL12 LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

Truck-Lite # 98034Y yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical, one (1) each side if the apparatus is 30' long or longer.

Truck-Lite # 98034R red reflectors shall be provided on the apparatus rear, one (1) each side at the outermost practical location.

LED LICENSE PLATE LIGHT - REAR

One (1) Tecniq model #L10 LED license plate light shall be provided above the mounting position of the license plate. The light shall be clear in color and shall have a chrome finish.

TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", white halogen back-up lights, shall be mounted one each side on a vertical plane with the turn/tail/stop signals. These lights shall activate when the transmission is placed in reverse gear.

Two (2) Whelen PLAST3V mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange.

The lights shall be mounted in order, from top to bottom, as described above.

CAB STEP LIGHTS

Polished stainless steel, TecNiq Eon 3-LED horizontal surface mounted chassis step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

BODY STEP LIGHTS

Polished stainless steel, TecNiq Eon 3-LED horizontal surface mounted body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all body access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

DUNNAGE AREA LIGHTING

Two (2) stainless steel, TecNiq Eon 3-LED horizontal surface mounted lights shall be provided in the dunnage area to provide adequate illumination of this area.

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HOSE BED LIGHTS

One (1) Amdor LED strip surface mounted lights shall be mounted in the hose bed on the front wall to illuminate the hose bed area.

HOSEBED WORK LIGHT SWITCH- RECESSED

The hose bed work light switch shall be installed in a recessed pocket.

HOSE BED WORK LIGHT - SWITCH

The hose bed work light shall have a protected 12-volt switch at the rear body panel. The switch will be labeled "HOSE BED WORK LIGHTS".

SCENE LIGHTS - REAR OF BODY

Two (2) Whelen M9LZC super LED scene lights shall be provided, one on each side of the rear body panel in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

REAR OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the rear of body lights on and off.

REAR OF BODY LIGHT SWITCHING - PUMP PANEL

A switch shall be provided on the pump panel to turn the rear of body lights on and off.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear and the apparatus is operating as an emergency vehicle (Primary Warning switch on).

GROUND LIGHTS - CAB

One (1) ROM V4 12" LED ground light shall be provided under each side cab door entrance step, four (4) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle.

GROUND LIGHTS - FRONT BUMPER

Two (2) ROM V4 12" LED ground light shall be provided under each side of the front bumper facing forward, four (4) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - PUMP PANEL

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One (1) ROM V4 12" LED ground light shall be provided under each side pump panel running board, two (2). The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - FRONT BODY

One (1) ROM V4 12" LED ground light shall be provided under each front body corner, two (2) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - REAR

Two (2) ROM V4 12" LED ground light shall be provided under each rear body corner, four (4) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

The lights shall be positioned to illuminate the ground under the rear tailboard.

GROUND LIGHT SWITCHING

The cab and body ground lights shall activate by engaging the parking brake.

ROOF MOUNT LED BROW LIGHT - ABOVE WINDSHIELD (BLACK LAMP & BRACKETS)

Fire Research Evolution II LED model FCA800-V20 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamp head and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

The lamp head shall have eight (8) ultra-bright white LEDs. It shall operate at 12 volts DC, draw 13 amps, and generate 20,000 lumens. The lamp head shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamp head shall incorporate heat-dissipating fins and be no more than 4" high by 11 1/2" wide. The lamp head and mounting arm shall be powder coated BLACK. The floodlight shall be for fire service use.

The Evolution II brow mounted flood light shall be located above the windshield in the center of the cab.

LIGHT(S) ABOVE WINDSHIELD SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the light(s) above windshield on and off.

LIGHT(S) ABOVE WINDSHIELD SWITCHING - PUMP PANEL

A switch shall be provided on the pump panel to turn the light(s) above the windshield on and off.

****** BODY ELECTRICAL SYSTEM ******

12 VOLT BODY ELECTRICAL SYSTEM

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All electrical lines in the body shall be protected by automatic circuit breakers, conveniently located to permit ease of service. Flashers, heavy solenoids and other major electrical controls shall be located in a central area near the circuit breakers.

All lines shall be color and function coded every 3", easy to identify, oversized for the intended loads and installed in accordance with a detailed diagram. A complete wiring diagram shall be supplied with the apparatus.

Wiring shall be carefully protected from weather elements and snagging. Heavy duty loom shall be used for the entire length. Grommets shall be utilized where wiring passes through panels.

In order to minimize the risk of heat damage, wires run in the engine compartment area shall be carefully installed and suitably protected by the installation of heat resistant shielded loom.

All electrical equipment shall be installed to conform to the latest federal standards as outlined in NFPA 1901.

BODY ELECTRICAL JUNCTION COMPARTMENT

A weather resistant electric junction compartment shall be provided within the body or pump enclosure, depending on vehicle configuration. This compartment shall provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment shall not decrease the storage capacity area of the compartment or area in which it is located. A removable panel shall be provided for access to this compartment.

PUMP ENCLOSURE WORK LIGHTS

Two (2) Tecniq model #E18 lights shall be provided inside the pump enclosure providing 800 lumens each. Each light shall have their own independent switch incorporated into the light head.

ENGINE COMPARTMENT WORK LIGHTS

Two (2) Tecniq model #E18 LED lights shall be provided inside the engine enclosure that will provide 800 lumens each. Each light shall have their own independent switch incorporated into the light head.

ON SCENE SOLUTIONS ACCESS SERIES COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the On Scene Solutions Access Series LED light fixture mounted one each side of the forward (and rear) vertical door frame. (the ladder bank will also have a compartment light.)

The lights shall come with a five (5) year warranty.

SURFACE MOUNTED SPECTRA MAX LED FLOODLIGHTS – DRIVER SIDE

Two (2) Fire Research Spectra Max LED model SPA260-Q20 surface mounted lights shall be installed, one rearward and one forward on the driver side of the body.

Each lamp head shall have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 13 amps, and generate 20,000 lumens of

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light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The LED scene lights shall be for fire service use.

SURFACE MOUNTED SPECTRA MAX LED FLOODLIGHTS – OFFICER SIDE

Two (2) Fire Research Spectra Max LED model SPA260-Q20 surface mounted lights shall be installed, one rearward and one forward on the officer side of the body.

Each lamp head shall have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 13 amps, and generate 20,000 lumens of light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The LED scene lights shall be for fire service use.

OFFICER SIDE OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the officer side of body lights on and off.

OFFICER SIDE OF BODY LIGHT SWITCHING - PUMP PANEL

A switch shall be provided on the pump panel to turn the officer side of body lights on and off.

DRIVER SIDE OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the driver side of body lights on and off.

DRIVER SIDE OF BODY LIGHT SWITCHING - PUMP PANEL

A switch shall be provided on the pump panel to turn the driver side of body lights on and off.

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" which includes disabling all white warning lights when the apparatus is in "Blocking Right of Way" mode.

LIGHT PACKAGE ACTUATION CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

WARNING LIGHT FLASH PATTERN

All of the perimeter warning lights shall be set to a default NFPA compliant flash pattern as provided by the light manufacturer.

UPPER LEVEL LIGHTING - WHELEN

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NFPA ZONE A, UPPER

A Whelen # F4N1QLED "Edge Freedom Series IV", 81" cab roof warning light bar shall be furnished and rigidly mounted on top of the cab roof.

The light bar shall be equipped with the following:

- Clear Lenses
- Two Front Corner Red Linear LEDs
- Two Red Forward Facing Linear LEDs
- Two White Forward Facing Linear LEDs
- Two Red End Linear LEDs.

If equipped, the forward facing white lights shall be automatically disabled for the "Blocking Right of Way" mode.

ADDITIONAL LIGHTS IN LIGHT BAR

The following lights are in addition to the required lights in the light bar.

The Freedom light bar shall be equipped with four (4) pair(s) of # F4DLR red LED warning lights.

The Freedom light bar shall be equipped with one (1) pair(s) of # F4DLC white LED warning lights.

NFPA ZONE C, UPPER

Two (2) Whelen M9* super LED light heads shall be furnished and mounted one (1) each side on the upper rear face of the body, facing rear.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

NFPA ZONES B & D REAR, UPPER

Two (2) Whelen M9* super LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the rear of the body, facing to each side of the unit.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

NFPA ZONES B & D FRONT, UPPER

Two (2) Whelen M9*, super LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the front of the body, facing to each side of the unit.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

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LOWER LEVEL LIGHTING - WHELEN

NFPA ZONE A, LOWER

Two (2) Whelen M6* super LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

The lower Zone A warning lights shall be mounted in the custom chassis headlight bezels.

NFPA ZONE C, LOWER

Two (2) Whelen M6* super LED light heads shall be provided and installed; one (1) each side directly below the DOT stop, tail, turn and backup lights.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

NFPA ZONES B & D FRONT, LOWER

Two (2) Whelen M6* super LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

The lower Zone B & D warning lights shall be mounted on the sides of the custom chassis front bumper.

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Whelen M6* super LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

NFPA ZONES B & D REAR, LOWER

Two (2) Whelen M6* super LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

WARNING LIGHT SYSTEM CERTIFICATION

The warning light system(s) specified above shall not exceed a combined total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way" mode.

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The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications. The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

Any large truck as defined by NFPA shall have the lower zone warning lights mounted no higher than 62" to the optical center of the warning light from ground level.

CAB RADIUS WARNING LIGHT MOUNTS

One (1) pair of radius brackets shall be provided on the front of the cab to provide a flat mounting surface for auxiliary warning lights. The brackets shall be welded on the cab during cab construction and shall be in line with the lower zone A warning lights.

AUXILIARY WARNING LIGHTS (CAB RADIUS)

Two (2) surface mounted Whelen M6* super LED light heads shall be furnished and mounted as directed by the fire department.

Each light head shall be equipped with red LED's and a colored lens.

The lights shall be installed with a chrome plated mounting flange.

******* AUDIBLE WARNING EQUIPMENT *******

ELECTRIC HORN

A single electric horn activated by the steering wheel horn button shall be furnished.

BACK-UP ALARM

An ECCO # 505, 87dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS

Two (2) chrome plated air horns shall be at the front of the vehicle. The air horns shall be mounted in full compliance with NFPA-1901. The supply lines shall be dual 1/4" lines with equal distance from each horn.

Both air horns shall be recessed in the driver side of the front bumper.

***C/S See image in QW

The air horn(s) shall be controlled by a foot switch on the officer's side and the steering horn button on driver's side. An air horn/electric DOT horn selector switch shall be furnished on the dash for the drivers steering horn button.

AIR HORN SHUT-OFF VALVE

A shut-off valve shall be provided for the air horn supply line.

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ELECTRONIC SIREN AND SPEAKER

One (1) Whelen # 295HFS2, 100 watt electronic siren shall be provided featuring: flush mount remote control head recessed in center dash panel as space allows, "Si-Test" self diagnostic feature, six (6) function siren, radio repeat and public address.

The electronic siren and speaker shall meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

One (1) Whelen, model # SP123BMC with chrome plated ABS outer flange, siren speakers shall be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

One (1) Federal Model #Q2B mechanical siren shall be provided to provide audible warning.

The Q2B siren shall be fully-recessed into the bumper on the driver's side. The siren shall be recessed so the front grille portion of the siren is flush with the front of the bumper.

Two (2) floor mounted foot switches shall be provided, one (1) for the officer and one (1) for the driver. A siren brake button shall be provided near the driver's position.

A second push button siren brake switch shall be provided on the cab dash near the officers seating position.

****** PUMP AND PLUMBING ******

PUMP

- **WATEROUS CSU-C20**
- **1500 G.P.M.**
- **SINGLE-STAGE**

The pump shall be of single-stage construction and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA-1901 and shall have a rated capacity of 1500 gpm.

The pump must deliver the percentage of rated capacity at the pressure listed below:

- 100% of rated capacity at 150 P.S.I. net pump pressure
- 100% of rated capacity at 165 P.S.I. net pump pressure
- 70% of rated capacity at 200 P.S.I. net pump pressure
- 50% of rated capacity at 250 P.S.I. net pump pressure.

The pump shall be free from objectionable pulsation and vibration under all normal operating conditions.

PUMP CONSTRUCTION

The pump body shall be close-grained gray iron and must be horizontally split in two sections for easy removal of the impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing setting of the pump in the chassis or apparatus piping which is connected to the

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pump. Pump body halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate reassemble.

Discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3-1/2 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the right side of the pump body, one outlet on the left side of the pump body, and one outlet on top of the pump discharge manifold.

IMPELLER SHAFT

The Impeller shaft shall be heat-treated stainless steel, ground at all critical areas, and polished under the packing. An exclusive two-piece impeller shaft shall allow separation of the transmission from the pump without disassembling either component. This simplifies repair procedures, resulting in less down time.

PUMP IMPELLER

The impeller shall be bronze, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse flow labyrinth-type wear rings that resist water bypass and loss of efficiency due to wear. The impeller shall have flame plated hubs to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped.

Wear rings shall be bronze, and shall be easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

BEARINGS

Three deep-groove, anti-friction ball bearings shall be located outside the pumping chamber, which shall give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated, completely separated from the water being pumped, and shall be protected by seal housings, finger rings and oil seals.

PUMP PACKING

Stuffing boxes be equipped with two-piece glands to permit adjustment or replacement of packing without disturbing the pump. Lantern rings located at the inner end of the stuffing boxes the all ring can be removed without removal of the lantern rings. Water shall be fed into the stuffing box lantern rings for proper lubrication and cooling when the pump is operating.

PUMP TRANSMISSION

The pump transmission shall be all aluminum "C20" model, rigidly attached to the pump body assembly and be of latest design incorporating a high strength involute tooth-form Hy-Vo chain drive. The driven sprockets shall be capable of operating at high speeds to provide smooth, quiet transfer of power. The shift engagement shall be accomplished by a free-sliding collar and shall incorporate an internal locking mechanism to insure that the collar shall be maintained in ROAD or PUMP position.

PUMP RATIO

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

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The manufacturer shall supply at time of delivery copies of the pump manufacturer's certification of hydrostatic testing, the engine manufacturer's current certified brake horsepower curve.

PUMP SHIFT

The pump shift shall be pneumatically operated and shall incorporate a standard automotive air valve shifting mechanism for ease of maintenance and parts availability.

The pump shift shall be mounted in the cab and identified as PUMP SHIFT, and include shift instructions permanently inscribed on the pump shift switch plate. The in cab control shall include a detent lock to prevent accidental shifting.

EMERGENCY PUMP SHIFT

An emergency manual pump shift control shall be furnished on the left side pump panel which may be utilized if the air shift control does not operate.

A transmission, manual lock-up switch shall be furnished in the cab to ensure positive lock-up of the transmission.

PUMP SHIFT INDICATORS LIGHT

The pump shift assembly shall incorporate an indicating light system which shall warn the operator if the shift to PUMP has not been completed and indicate when it has been completed. The switch that activates the lights must be mounted on the pump transmission and positioned so that the pump shift arm activates the switch only when the shift arm has completed its full travel into PUMP position.

TRANSMISSION LOCK

The automatic transmission furnished in the chassis shall have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

BRAKING SYSTEM

A positive braking system shall be provided to prevent vehicle movement during pumping operations. The air brakes furnished must satisfy this requirement.

MAIN PUMP MOUNTS

Extra heavy duty pump mounting brackets shall be furnished. These shall be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints shall be the same on each end of the drive shaft. This shall assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize Grade 8 bolts.

Pumps which are not mounted directly to the frame will not be considered. Under no circumstance shall the pump function as a frame cross member.

***** PRESSURE CONTROL & ACCESSORIES *****

PUMP PRESSURE CONTROL SYSTEM

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The apparatus shall be equipped with a Fire Research PumpBoss model# PBA400 pressure governor and monitoring display kit. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 1/2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. Inputs to the control module from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:

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

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

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

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

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

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

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

INTAKE RELIEF VALVE

A Task Force Tips relief valve shall be provided. The valve shall be adjustable from 50 to 300 psi (3 to 14 bar) with easy to see 25 psi (2 bar) increments. The aluminum casting shall be hardcoat anodized, and powder coat finished inside and out for maximum corrosion protection.

PUMP CERTIFICATION

The pump shall be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company shall be Underwriters Laboratories (UL).

TRIDENT "AUTOMATIC" AIR PRIMING SYSTEM

A Trident automatic air operated priming system shall be installed. The unit shall be brass and stainless steel construction, no aluminum shall be used. The priming system shall be fully compliant of applicable NFPA standards for vertical lift. Noise level during operation of the primer shall not exceed 75Db.

The 12 volt primer control shall be an "automatic" type, with a pump panel three-way switch to operate an air solenoid valve.

Automatic Priming switch shall have three positions:

- "Prime"- the lower position shall be a momentary "push to prime". The "Prime" position also allows the operator to "ramp" test the primer without the fire pump being engaged.
- "Off" - center position.
- "Auto-Prime" - in the upper position, a "green" LED pilot light shall be illuminated when the switch is in the auto-prime position. Auto-Prime shall operate automatically when the pump pressure drops 20 PSIG. The primer shall shut "off" automatically when the pump pressure is re-established and exceeds 20 PSIG.

MASTER DRAIN VALVE

A Class One, rotary type, 12 port multiple master drain valve shall be provided and controlled at the lower portion of the side pump panel. The valve shall be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories. Water shall be drained below the apparatus body and away from the pump operator.

INDIVIDUAL BLEEDERS AND DRAINS

All lines shall drain through the master drain valve or shall be equipped with individual drain valves, easily accessible and labeled.

One (1) individual "TRIDENT" quarter turn drain valve shall be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves shall be located at the bottom of the side pump module panels.

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All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush and air bleeder valves.

ANODE BLOCKS

Two (2) Waterous zinc anode blocks shall be provided and located on the suction side of the pump to protect the pump from corrosion.

The Anodes shall be painted Safety Yellow for identification purposes.

PUMP OVERHEAT INDICATOR SYSTEM

A Waterous Overheat Protection Manager (OPM) shall be provided to serve as a safety device by releasing hot water from the discharge area of the pump to the ground. The OPM consists of a valve that opens when the water in the pump reaches 140 F (60 C) and a warning light that is triggered by a thermal switch when the water in the pump reaches 180 F (82 C). The warning light acts as an additional protection device if the temperature inside the pump keeps rising although the valve is open. The OPM valve and switch are both mounted on two 1/2" tapped holes located near the center discharge area of the pump.

An audible alarm shall be provided on the operator's panel to alert the operator when the thermal relief valve is activated.

PUMP MODULE

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards. The pump module shall be securely mounted to the chassis frame rails.

The pump module shall be a welded frame work utilizing structural steel components properly braced to withstand the rigors of chassis frame flex.

DUNNAGE AREA

A dunnage area shall be provided above the pump enclosure for equipment mounting and storage. This area shall be furnished with a removable 3/16" aluminum tread plate floor and shall be enclosed on the sides.

NOTE: The size of this storage area may vary when top mounted crosslays, booster reel(s), etc., are specified and located in this area.

***** PUMP SUCTIONS & AUXILIARY INLETS *****

SUCTION INLETS

Two (2) 6" N.S.T. suction inlets shall be provided, one on the driver side pump panel and one on the officer side pump panel. A removable strainer shall be installed on each inlet.

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PUMP SUCTION ENDS

The main pump suction inlets shall be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

A 6" NST chrome plated long handle pressure vented cap shall be installed on each main inlet of the pump.

AUXILIARY SIDE SUCTION(S)

One (1) 2-1/2" auxiliary suction shall be provided at the **driver side** pump panel, to the rear of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side rear auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

A 1/4 turn swing control handle shall be provide on the driver side rear auxiliary suction valve

One (1) 2-1/2" auxiliary suction shall be provided at the **officer side** pump panel, to the rear of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side rear auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

A 1/4 turn swing control handle shall be provided on the officer side rear auxiliary suction valve.

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels.

TANK TO PUMP

One (1) 4" tank to pump line shall be piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump. This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve shall be provided to prevent accidental pressurization of the water tank through the pump connection. Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided between the pump suction manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

A push/pull control handle shall be located on the operator's panel with function plate.

TANK FILL

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One (1) 2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2" high pressure hose for tank connection to accommodate flexing between components.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided between the pump discharge manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

A push/pull control handle shall be located on the operator's panel with function plate.

***** DISCHARGES & ACCESSORIES - SIDE MOUNT *****

DRIVER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges # 1 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

The driver's side #1 discharge cap provided as standard equipment shall be deleted.

One (1) 2-1/2" NSTF X 1-1/2" NSTM reducer with cap shall be provided on the driver's side # 1 discharge.

The driver's side # 1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The driver's side # 1 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

DRIVER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges # 2 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side #2 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seat.

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The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

The driver's side # 2 discharge cap provided as standard equipment shall be deleted.

A 2-1/2" NSTF X 1-1/2" NSTM reducer with cap shall be provided on the driver's side # 2 discharge.

The driver's side # 2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The driver's side # 2 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

OFFICER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #1 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

The officer's side # 1 discharge cap provided as standard equipment shall be deleted.

A 2-1/2" NSTF X 1-1/2" NSTM reducer with cap shall be provided on the officer's side # 1 discharge.

The officer's side # 1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The officer's side # 1 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

OFFICER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #2 shall terminate with NST threads, through the officer's side panel above the main pump intake.

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The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

An Akron Brass 4" Heavy Duty Swing-Out™ Valve shall be provided for the officer's side #2 discharge. The valve shall have an all brass body with flow optimizing flat ball and dual polymer seats.

The discharge valve shall be equipped with a straight 4" NST adapter that shall be equipped with a 4" NST, 30-degree, chrome plated elbow.

The officer's side #2 discharge cap provided as standard equipment shall be deleted.

A 4" NSTF X 5" Storz Kochek S37S straight adapter with cap shall be provided on the officer's side #2 discharge.

The officer's side #2 discharge valve shall be gated with an Akron Hand wheel controlled, inline valve. The valve shall be controlled at the pump operator's panel with a chrome plated hand wheel and mechanical valve position indicator.

The officer's side #2 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

OFFICER SIDE REAR DISCHARGE

A 2 1/2" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

The rear discharge shall terminate on the rear body panel, on the officer side of the body, under the ladder bank.

***C/S See attached image in QW

The officer side rear discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The officer side rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side rear discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The officer side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The officer side rear discharge cap provided as standard equipment shall be deleted.

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One (1) 2-1/2" NSTF X 1-1/2" NSTM reducer(s) with cap shall be provided on the officers side rear discharge.

The officer side rear discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

DRIVER SIDE HOSE BED DISCHARGE

A 2 1/2" NST rear hose bed discharge shall be plumbed to the upper front body panel, extending into the front of the hose bed.

The rear hose bed discharge shall terminate just above the hosebed floor, in the driver side front of the hose bed.

The driver side hose bed discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The driver side hose bed discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side hose bed rear discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The driver side hose bed discharge valve shall be controlled by a push/pull handle located on the operator's panel.

One (1) 2 1/2" NST chrome plated pressure vented cap shall be installed the driver's side hose bed discharge.

The driver's side hose bed discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

DECK GUN DISCHARGE

A deck gun discharge shall be plumbed from the pump to an area on top of the vehicle. The deck gun piping shall be firmly supported and braced.

The deck gun discharge shall be located in the center of the dunnage area above the pump module. A pedestal type, 1/4" steel plate support assembly shall be provided to stabilize deck gun plumbing below deck gun mount flange.

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The deck gun discharge pipe shall terminate with a groove flange.

To improve the operation range of the deck gun, the discharge pipe shall be outfitted with a TFT (18") Extend-A-Gun, part # XG18VL-PL. The Extend-A-Gun shall be wired to the hazard light on the cab dash.

WARNING LIGHT - IN CAB - "DECK GUN RAISED"

A hazard warning light shall be installed to alert the driver, "Deck Gun Raised".

The deck gun piping shall be designed so the overall height of the NESTED deck gun in the mounted/stowed position does not exceed the tallest point on the cab/body, but will be stowed at the maximum height.

The deck gun discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided for the deck gun discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The deck gun discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The deck gun discharge shall be equipped with a Class One Sub-Z II, 2 ½" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

TFT MANUAL DECK GUN

A TFT Hurricane monitor shall be supplied and mounted on the deck gun discharge of the unit to provide the maximum travel clearance.

TFT MASTER STREAM NOZZLE (FD SUPPLIED)

A TFT model "MASTER STREAM" 1000 GPM nozzle shall be supplied by the department for the deck gun.

TFT STACKED TIPS

A set of TFT stacked tips and stream straightener shall be provided with the monitor.

FRONT DISCHARGE

A 1 1/2" front #1 discharge shall be plumbed to the front bumper of the vehicle.

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The front #1 discharge shall terminate on the top officer's side of the front bumper extension gravel shield with a chrome 1 1/2" NST chicksan swivel adapter.

The front #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability. Automatic discharge drains shall be provided at all low points in the plumbing.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the front #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The front #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

A 1 1/2" NST chrome plated pressure vented cap shall be installed the front #1 discharge.

The front #1 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

HORIZONTAL CROSSLAY #1

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

Crosslay #1 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hose bed.

A minimum of one(1) grooved pipe coupling shall be furnished in this assembly, if necessary, to allow for flex and serviceability.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the crosslay #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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The crosslay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #1 discharge shall be equipped with a Class One Sub-Z II, 2 ½" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

HORIZONTAL CROSSLAY #2

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

Crosslay #2 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hose bed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #2 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hose bed.

A minimum of one(1) grooved pipe coupling shall be furnished in this assembly, if necessary, to allow for flex and serviceability.

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the crosslay #2 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The crosslay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #2 discharge shall be equipped with a Class One Sub-Z II, 2 ½" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

HORIZONTAL CROSSLAY #3

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

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Crosslay #3 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #3 hose bed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #3 discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one(1) grooved pipe coupling shall be furnished in this assembly, if necessary, to allow for flex and serviceability.

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the crosslay #3 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The crosslay #3 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #3 discharge shall be equipped with a Class One Sub-Z II, 2 1/2" diameter interlube filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

PUMP ENCLOSURE HOSEBED HOSE RETENTION

A 3/16" polished aluminum tread plate cross lay cover shall be provided with a full length stainless steel hinge at the front of the cover.

Vinyl flaps shall be provided at each side of the transverse cross lay compartment secured to the tread plate cross lay cover by quarter turn fasteners, and equipped with a strap to each end.

The crosslay end flap shall be green in color.

BOOSTER REEL #1 DISCHARGE

A 1 1/2" booster reel discharge shall be plumbed from the pump to the booster reel.

The booster reel discharge shall be plumbed from the valve to the hose reel utilizing 1" high pressure hose. The end of the hose connected to the hose reel shall be equipped with a swivel end for ease in hose replacement.

A 1 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the booster reel #1 discharge.

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The booster reel discharge valve shall be controlled by a push/pull handle located on the operator's panel.

No individual pressure gauge shall be provided for the booster reel.

BOOSTER REEL #1

One(1) Hannay, aluminum, Super Booster, electric rewind booster reel shall be furnished. The reel shall be equipped with a one(1) inch 90° full flow swivel joint and an adjustable brake for freewheeling, drag or full lock operation.

The booster reel #1 shall be mounted above the pump enclosure towards the driver's side of the unit.

Booster reel rewind shall be controlled by a pump panel mounted push button on the driver's side panel. The booster reel circuit shall be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind button.

The booster reel shall be equipped with the maximum amount of 3/4" booster hose possible. Each length shall be fitted with NST couplings.

***Since the narrow tall reel is required, this will be thoroughly discussed at the pre-construction meeting to confirm exactly what capacity of 3/4" hose this reel will be capable of carrying.

***The hose will be FD Supplied.

****** PUMP PANEL & ACCESSORIES ******

PUMP PANEL SIZE AND LAYOUT AS CLOSE TO EXISTING UNIT

The pump panel design will be as close to the existing current KME engine GSO 9823 as possible. Size, discharge colors and design will all match for ease of training and operation.

***C/S See attached image.

PUMP PANEL - SIDE MOUNT

The pump operator's control panel shall be located on the driver side of the apparatus. The pump enclosure side panels shall be completely removable and designed for easy access and servicing.

PUMP PANEL MATERIAL

The left side operator's panel, gauge panel, right side pump panel and right side access door shall be fabricated from 12-gauge 304L stainless steel with a #4, (150/180 grit), standard brushed finish.

HINGED GAUGE PANEL

A full width, vertically hinged gauge access panel shall be provided at the operator's position. Chrome plated positive locks shall be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

VERTICALLY HINGED, SPLIT PUMP PANEL OFFICER SIDE

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The officer's side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the officer side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

PUMP ACCESS PANELS

Two (2) removable pump access panels shall be furnished at the forward area of the pump enclosure accessed from the front when the cab is tilted. Each access panel shall be fabricated from 1/8" aluminum tread plate.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position. The panels shall be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters shall be equipped with tether cables and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polished trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL LIGHT SHIELD AND STEP

The pump operator's panel shall be equipped with a light shield/step that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel. (Note: On apparatus with lowered style crosslays, the light shield shall be from the back of the crosslays to the rear of the pump house).

The light shield shall be equipped with the following lights:

- Two (2) 20" Amdor Luma Bar H2O super bright led strip lights.

One (1) light under the operator's panel light shield shall be actuated when fire pump is engaged in addition to the pump engaged light.

OFFICER SIDE PUMP PANEL LIGHT SHIELD AND STEP

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The officer side pump panel shall be equipped with a light shield/step that shall be full width of the panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

- Two (2) 20" Amdor Luma Bar H2O super bright led strip lights.

The lights shall be switched with the operator panel lights.

PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel shall accommodate the following:

- Hinged gauge panel
 - Water tank fill valve
 - Auxiliary suction valve control
 - All discharge valve controls
 - Auxiliary engine cooler controls
 - Water tank suction control valve
 - Pump primer valve
 - Engine throttle control
 - Master compound vacuum gauge
 - Master pressure gauge
 - Individual discharge gauges
 - Pump shift engaged indicator light
 - Water tank water level indicator
 - Engine tachometer
 - Engine oil pressure gauge with audible alarm
 - Engine water temperature gauge with audible alarm
 - Low voltage light and audible alarm
 - Pump panel light switch
 - Speed counter (Underwriters)
 - Pump performance plate (Underwriters)
 - Pump serial No. plate
 - Master pump drain valve
 - Individual drains
 - Voltmeter
 - Air inlet/outlet at lower driver side panel
-
- Pump panel air horn actuation button labeled "EVACUATION" in white letters with a red background.
 - 3/4" Pump cooler (By-pass Line).
 - Air inlet/outlet chuck (right side panel).
 - A quarter turn valve shall be provided for each air chuck.
 - Fire Research "Pump Boss" pressure governor control.

SWITCH FOR LIGHTED PANELS

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A separate switch for the pump panel green lights will be provided and installed.

PUMP TEST PORTS

The pump panel shall be equipped with Vacuum & Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels. Chrome plugs and labels shall be provided for the test ports.

MASTER GAUGES

One (1) 4-1/2" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4-1/2" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be Class One Sub-Z II, interlube filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

ENGINE COOLER

An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator. The cooler shall permit the use of water from the pump for cooling the engine. The cooling shall be done without mixing engine and pump water.

TANK LEVEL GAUGE

A Fire Research, model #WLA300-A00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright multi color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped with a self-calibration feature that allows the LEDs TANKVISION gauge to be used on tanks of different shapes and sizes.

Features:

- Flashes warning when the volume is less than 25%. Rapid down scrolling LEDs alert the operator when the tank is almost empty. Remote audio warning available.
- One size fits all'. The self-calibration feature allows for easy calibration of any shape or size tank.
- Multiple displays are possible with a single sender through the FRC data bus.
- Rugged waterproof cast aluminum housing.
- No fitting needed for poly tank.
- Special fittings available for other tank materials.
- Connector disconnects at back of display.

REMOTE TANK LEVEL GAUGE

An additional Fire Research, model #WLA300-B00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the front cab face of the vehicle. The "TANKVISION" gauge is designed for both ease of operation and installation. TThe "TANKVISION" gauge utilizes ultra

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bright multi color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped with a self-calibration feature that allows the TANKVISION gauge to be used on tanks of different shapes and sizes.

***The exact location will be discussed at the pre-construction meeting.

Features:

- Flashes warning when the volume is less than 25%. Rapid down scrolling LEDs alert the operator when the tank is almost empty. Remote audio warning available.
- One size fits all.
- The self-calibration feature allows for easy calibration of any shape or size tank.
- Multiple displays are possible with a single sender through the FRC data bus.
- Rugged waterproof cast aluminum housing.
- No fitting needed for poly tank.
- Special fittings available for other tank materials.
- Connector disconnects at back of display.

The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

WATER TANK

The water tank shall have a capacity of 950 to 1000 gallons, constructed from Poly material.

WATER TANK CONSTRUCTION

The Poly water tank shall be constructed of PT3 polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

WATER CAPACITY CERTIFICATION

All tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered

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with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

WATER TANKNOLOGY TAG

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

WATER TANK ISO CERTIFICATION

The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2000 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

WATER TANK LID

The tank cover shall be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowers shall accommodate the necessary lifting hardware.

WATER TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3 polypropylene and shall be a minimum dimension of 12" x 12" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

WATER TANK OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

WATER TANK SUMP

The tank sump shall be a minimum of 10" wide x 10" long x 3" deep. An anti-swirl plate shall be mounted inside the sump, approximately 1" above the bottom of the sump.

WATER TANK SUMP CONNECTION

The front bulkhead of the water tank shall be fitted with one (1) tank sump connection.

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WATER TANK 4" SUMP DRAIN

A 4" drain plug shall be provided.

WATER TANK FLANGES/OUTLETS - PUMPER

There shall be two (2) standard tank outlets; one for tank-to-pump suction line which shall be a minimum of 4" coupling and one for a tank fill line which shall be a minimum of a 2" NPT coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING ALL "T" TANKS - PUMPER

The tank shall rest on the body cross members spaced a maximum of 22" apart, and shall be insulated from these cross members with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank shall sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces shall act as water tank retainers.

STREAMLINE BODY & CAB

The body and cab will be the same height for a streamline appearance.

APPARATUS BODY DESIGN CONSTRUCTION

The body side and compartment assemblies shall be designed and assembled to provide maximum strength and durability under all operating conditions.

Special attention shall be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components shall be provided with a dissimilar metals isolation barrier to prevent electric corrosion. The body design shall also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units.

The body assembly shall be an all-welded configuration. The body shall be completely isolated from the cab and pump module structure.

Dimensions used in this specification shall be the general outer dimension taken from a typical line diagram of the apparatus. These dimensions shall not take into account items like material thickness, access panels, doors, and other installed options.

COMPARTMENT TOPS

Compartment ceilings shall be a fully welded design as part of the body construction process. Compartment designs that do not have a welded in ceiling shall not be acceptable.

COMPARTMENT DRIP MOLDING

Compartment doors shall have drip molding to provide protection against water runoff.

REAR BODY PANEL

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The rear body panel shall extend the full width between the body side compartments. This panel shall be full height from the rear step to the hose bed floor. No part of the rear panel shall be attached to the booster tank. The rear body panel material shall be aluminum tread plate as standard. If Chevron striping is specified for the rear of the body then smooth aluminum shall be utilized.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

All compartment panels and body side sheets shall be fabricated entirely of 3/16" aluminum (5052-H32). Each side compartment assembly shall be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The side compartments shall be welded on a fixture to ensure true body dimensions of all door openings. The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld shall not be used due to the applied heat which shall distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams shall be caulked prior to finish paint to ensure proper compartment seal.

SUB STRUCTURE - ALUMINUM

The body sub structure shall be an all welded configuration utilizing a combination of 3" x 1-1/2" 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure shall be designed to totally support the full length and width of the body and shall be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The sub structure shall be bolted to the sides of the chassis frame at four (4) points. The two (2) forward mounting points shall utilize a spring mount to help isolate the body from chassis deflection.

This design shall provide storage capacity in each side compartment for a minimum of 500 lbs of equipment, and a minimum of 1000 lbs of equipment in the rear step compartment.

FIRE BODY WIDTH

The fire body shall be 100" wide to provide the maximum amount of usable hose bed and compartment space. The side body compartments shall be 29" deep in any full depth areas, and 14" deep in any split depth areas.

BODY FENDER

The body fender shall be 64" long, this shall allow for the suspension and related components to be contained within the fender, preventing any intrusion into the body compartment storage area. Bodies with notches in the front and/or rear compartment for suspension components are not acceptable.

DRIVER SIDE - FRONT SECTION OF FENDER

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep. The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices.

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This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

DRIVER SIDE - REAR SECTION OF FENDER

A storage compartment shall be inserted into the fender to provide an open storage area for customer supplied devices such as salvage tarps, rope bags, etc. The storage area shall be sized as tall and wide as possible in the fender (minimum of 15" wide x 7-3/4" tall), and shall be 26" deep.

This storage compartment shall provide a minimum of 1.6 cubic feet of storage space.

OFFICER SIDE - FRONT SECTION OF FENDER

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep. The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

OFFICER SIDE - REAR SECTION OF FENDER

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep. The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

FENDER STORAGE DOORS

The fender storage area(s) shall be enclosed by a hinged door fabricated from the same material as the primary body construction, and painted the primary body color. The back side of the door shall have a section of Nylatron installed to protect the door surface from the items stored in the compartment. Each door shall be tied into the compartment door ajar/do not move apparatus warning system.

DRIVER SIDE BODY COMPARTMENTATION

One full height/full depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 49" wide x 68" tall x 29" deep.

One high side compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 37" high x 29" deep.

One full height/full depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 56" wide x 68" tall x 29" deep.

The driver side compartments shall provide approximately 160 cubic feet of storage space.

OFFICER SIDE BODY COMPARTMENTATION

the upper 38" tall area.

One high side compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 37" high x 14" deep.

One full height/split depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 56" wide x 68" tall x 29" deep in the lower 30" tall area, and 14" deep in the upper 38" tall area.

The officer side compartments shall provide approximately 106 cubic feet of storage space.

REAR STEP COMPARTMENT

An equipment storage compartment shall be provided on the rear of the body at the rear step area. The rear step compartment shall be 42" Wide x 68" High x 29" Deep.

The rear step compartment shall provide approximately 48 cubic feet of storage space.

The rear step compartment shall have full side panels which shall isolate this storage area from the side body compartments.

The rear step compartment shall be equipped with a roll up style door.

EXTENDED REAR STEP - SQUARE CORNERS

The extended rear step shall be 8" deep, extended beyond the body compartments. The step shall be 100" wide, with square corners. The step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. The step shall be bolted into place with a minimum 1/2" clearance gap between the step and rear body panel.

HOSE BED (94" WIDE)

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

For added strength, the hose bed side walls shall be approximately 3" thick, this shall provide a mounting surface for devices like warning lights and scene lights. The inner hosebed side walls shall be brushed aluminum panels, which shall prevent damage to painted surfaces when deploying hose. The front wall shall be flanged inward 2" with a 1" downward return to provide additional rigidity to the front wall.

HOSE BED CAPACITY

The hose bed shall be designed with enough storage capacity to carry the following customer specified hoseload:

- 1,200 Feet of 5" supply hose
- 400 Feet of 3" supply hose

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One full height/split depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 49" wide x 68" tall x 29" deep in the lower 30" tall area, and 14" deep in the upper 38" tall area.

One high side compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 37" high x 14" deep.

One full height/split depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 56" wide x 68" tall x 29" deep in the lower 30" tall area, and 14" deep in the upper 38" tall area.

The officer side compartments shall provide approximately 106 cubic feet of storage space.

REAR STEP COMPARTMENT

An equipment storage compartment shall be provided on the rear of the body at the rear step area. The rear step compartment shall be 42" Wide x 68" High x 29" Deep.

The rear step compartment shall provide approximately 48 cubic feet of storage space.

The rear step compartment shall have full side panels which shall isolate this storage area from the side body compartments.

The rear step compartment shall be equipped with a roll up style door.

EXTENDED REAR STEP - SQUARE CORNERS

The extended rear step shall be 8" deep, extended beyond the body compartments. The step shall be 100" wide, with square corners. The step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. The step shall be bolted into place with a minimum 1/2" clearance gap between the step and rear body panel.

HOSE BED (94" WIDE)

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

For added strength, the hose bed side walls shall be approximately 3" thick, this shall provide a mounting surface for devices like warning lights and scene lights. The inner hosebed side walls shall be brushed aluminum panels, which shall prevent damage to painted surfaces when deploying hose. The front wall shall be flanged inward 2" with a 1" downward return to provide additional rigidity to the front wall.

HOSE BED CAPACITY

The hose bed shall be designed with enough storage capacity to carry the following customer specified hoseload:

- 1,200 Feet of 5" supply hose
- 400 Feet of 3" supply hose

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- **400 Feet of 2-1/2" attack hose**

HOSE BED FLOORING

Flooring to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring shall be smooth and free from sharp edges to avoid hose damage. The hose bed floor shall be removable to provide access to inner body framework.

HOSE BED PARTITION

Two (2) fully adjustable 1/4", aluminum hose bed partition shall be provided. Partition shall be easily adjustable by means of channels located at the front and rear of the hose bed. Partition shall be removable for access to the booster tank.

HOSE BED FULL WIDTH DIVIDER

A full width divider shall be installed in the hose bed located approximately 2" beyond the end of the water fill tower. This divider shall be constructed of smooth aluminum and shall be fixed. The adjustable hose bed dividers shall be installed up to this divider with the adjustment tracking attached to the fixed divider.

HOSEBED PARTITION REINFORCEMENT

The top and rear edge of each of the hose bed partitions shall have a 3/4" integral tubing reinforcement welded on for additional support.

VINYL HOSE BED COVER - 1/4 TURN FASTENERS

A hose bed cover shall be provided and installed. The cover shall be made from 22 ounce; heavy-duty vinyl coated polyester fabric (TXN 226). The cover shall be sewn with ultraviolet resistant thread and shall have 2" wide nylon webbing sewn around the perimeter to provide additional strength.

The cover shall be secured to the top front body flange with quarter-turn fasteners. The cover shall be secured to the side body flanges with quarter-turn fasteners. A weighted flap shall be furnished on the rear of the cover with two (2) bungee cords.

The Hypalon material shall be green in color.

HOSE BED COVER LETTERING

Material backed, 7-1/2" tall, Scotchlite Letters shall be sewn onto the hose bed cover rear flap(s).

The color of the letters shall be

The lettering shall read . (Up to 10 characters)

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments. The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

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The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

AMDOR ROLL-UP DOORS

The roll-up doors shall be Amdor brand roll-up doors, equipped with a satin finish, with a dual durometer slat seal. The slats shall be made from 1" double-wall aluminum with a continuous ball and socket hinge joint. The interior of the door shall use a smooth interior door curtain to prevent equipment hang-ups. The bottom panel flange shall have a stainless steel lift bar latching system with cut-outs for ease of access with gloved hands.

PROTECTION PANELS

Seven (7) protection panels shall be provided at the top of all body exterior compartments fitted with roll-up doors. The panels shall be installed below the roll-up area to prevent possible damage to the roll-up door by misplaced equipment. Each protection panel shall be bolted in place and be made of aluminum tread plate.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartment with hinged doors shall have the door opening flanges bend down to produce the sweep-out design.

Compartment with roll-up style doors shall have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design shall also permit easy cleaning.

STAINLESS STEEL SILL PROTECTORS

Stainless steel scuff plates shall be installed on the floor of each compartment near the edge of the door opening to protect the compartment floor when accessing equipment from the compartment.

A total of one (1) scuff plates shall be provided.

COATED FASTENERS

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

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Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided (if applicable) to access fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring. The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

BODY PROTECTION PANELS

The front face of the side compartments, next to the driver and officer pump panels shall be overlaid with full height aluminum tread plate protection panels. The overlays shall cover the front face of the compartments only, they shall not wrap around to the door opening.

BODY SCUFF PANEL

A polished stainless steel scuff plate shall be installed on the rear body corners. The scuff plate shall extend the full height of the body corner panel.

BODY RUB RAILS

Sacrificial aluminum tread plate rub rails shall be mounted at the base of the body, extend outward a minimum 3/4", downward 2" and flange inward 1". The rub rails shall extend the full length of the main body and extend to the rear step or wrap around the rear body corners. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

INTERMEDIATE REAR STEP

An eight (8) inch deep, bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, shall be installed. The step shall be approximately 8" deep x 42" wide.

ROM V4 UNDER REAR BOLT ON STEP LIGHT

A ROM V4 LED strip light will be installed under the rear bolt on step.

GRAB RAILS

All hand rails shall be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

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Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Grab rails shall be provided at the following specified locations. Additional grab rails shall be provided adjacent to any additional steps specified to comply with NFPA 1901.

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

Two (2) vertical handrails shall be mounted above each pump panel, (1) each side.

FOLDING STEPS-FRONT OF BODY

Four (4) Austin Hardware model FS-200 CHR large folding steps, made of high strength die cast aluminum, with a textured chrome plate finish, minimum of 42 in² surface, conforming to NFPA-1901 requirements, shall be provided on the front face of the running board compartments, above running board steps, two (2) each side. The steps shall be mounted to accommodate access to the body hose bed area with a maximum of 18" height between each step.

FOLDING STEP(S)- BODY REAR DRIVER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on driver side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

FOLDING STEP(S) - BODY REAR OFFICER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on officer side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

REAR WHEEL WELL LINERS

Fully removable, one piece, bolt-in, stainless steel rear wheel well liner and fenderette will be provided. The wheel well liners will be natural metal finish and will protect the front and rear compartments and main body supports from damage. Wheel well liners and fenderettes which are welded in place or are only partially removable shall not be considered.

REAR MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

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REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

****** COMPARTMENT ACCESSORIES ******

HALF DEPTH ADJUSTABLE SHELIVING

Compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Half depth adjustable shelves shall be located as follows:

One (1) in the officer side front compartment

One (1) in the officer side rear compartment

Two (2) in the rear step compartment behind the cascade bottle storage.

ADJUSTABLE SHELIVING

Compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves shall be located as follows:

Two (2) in the driver side front compartment

Two (2) in the driver side rear compartment

One (1) in the driver side front high side compartment

SLIDE OUT FLOOR MOUNT SHELIVING

Slide out floor mount compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to #250 rated slides. Slide out floor mount shelving shall have gas shocks to hold the tray in and out.

Slide out floor mount shelving shall be provided as follows:

One (1) in the driver side front compartment

One (1) in the officer side front compartment

One (1) in the driver side rear compartment

One (1) in the officer side rear compartment

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VERTICAL DIVIDERS

Full height, fixed mounted, vertical compartment dividers shall be fabricated from 3/16" brushed aluminum material. The dividers shall extend the full depth of the specified compartment from the floor to the compartment ceiling.

Full height, vertical dividers shall be located as follows:

One (1) full height fixed divider(s) shall be located as directed by the fire department

SCBA CYLINDER STORAGE RACK (SINGLE STACK)

A storage rack shall be provided to accommodate six (6) SCBA cylinders. The rack shall be constructed from individual, formed aluminum trays welded to structural aluminum framework. The entire rack shall be covered with Speedliner material. The rack shall be located as directed by the fire department.

AIRBAG STORAGE

A storage module shall be provided for six (6) high pressure airbag(s). The module shall be constructed from 1/8" aluminum and custom designed. The location shall be determined by the fire department.

TURTLE TILE

Turtle Tile brand floor material shall be installed on all compartment floors. The Turtle Tile shall be custom installed to provide full floor coverage.

Floor matting material shall be provided on nine (9) specified shelf(s) or roll-out tray(s).

The compartment flooring color shall be green.

PAC TRAC

Aluminum Pac Trac #7000 channel material for tool and equipment mounting shall be provided in three (3) high side compartment(s), approximately 50" wide x 29" high. All installation hardware shall be stainless steel.

CASCADE AIR SYSTEM

STORAGE BOTTLE(S)- DOT

The cascade system shall be provided with an air storage system consisting of:

- Four (4) 6,000 psi UN / ISO DOT air storage receivers. Each receiver shall be permanently stamped or identified in accordance with DOT regulations.
- Each cylinder shall have a working pressure of 6,000 psi with a 2.4:1 safety factor. The nominal capacity of each receiver shall be 509 cu.ft. at 6,000 psi, 70 degrees F.
- Each receiver shall have a shutoff valve. There shall be a label, external of the bottle which reads, "HIGH PRESSURE -6,000 psi BREATHING AIR".
- The air cylinders shall be securely mounted at both ends. The mounting system shall be designed to withstand severe service to be expected of this type of apparatus.

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The storage bottle(s) shall be mounted in Compartment REAR, pending final engineering review.

CONTAINMENT FILLING STATION - TWO (2) POSITION

The fill enclosure shall be an Appleton Space Saver, designed for mobile applications and have the ability to fill two (2) SCBA or SCUBA cylinders, either simultaneously or individually. A prototype of the fill station must have been tested under NFPA-1901 guide lines. A certification certificate shall be available upon request.

The unit shall be constructed of .25 inch plate steel. The fill enclosure door is constructed of .25 inch stainless steel. The cylinder holders shall be lined with a material to protect each cylinder from abrasion. Access to the enclosure for filling cylinders shall be through a manually operated slide-up door and tilt out bottle holder. Three (3) gas filled springs shall be provided to assist in the operation of the fill station door and cylinder holders. A mechanical twist latch shall be provided to secure the door in the closed position.

The loading position from a standard truck compartment floor to the center of the bottle valve shall be approximately 13.6 inches in the lower holder and 23.5 inches in the upper holder. The maximum length of either a SCBA or SCUBA bottle with the valve and fill adapter is 29 inches. An automatic, air operated, safety interlock system shall be provided to prevent the accidental filling of a cylinder until the door is completely closed and latched. Two fill hoses shall be provided, each with stainless steel SCBA fill adaptors, and bleeder on/off valves shall also be provided and located inside the fill enclosure.

The fill station shall be designed so if a cylinder should rupture, rapidly expanding air is vented through an opening in the bottom of the enclosure and out through the compartment floor. A breakaway rubber seal shall be provided to seal the compartment floor. The fill station shall be designed to conserve space and shall not exceed the following dimensions: 13.5" inches wide by 43" inches high by 23.5" inches deep. Note: the fill station door shall not exceed 53 inches high with the door in the open position. The fill station shall not exceed 425 pounds.

FILL CONTROL PANEL

The cascade air system fill control system shall include a control panel with all components, devices and piping necessary to provide breathing air from the storage cylinders to the SCBA bottles being filled. The control panel shall be custom fabricated from stainless steel.

The fill control system shall be designed for the number of storage banks listed above. The system shall permit filling or drawing down each air storage cylinder, independently of each other, while filling SCBA/SCUBA cylinders. The system shall allow regulating the fill pressure into any SCBA cylinder to prevent over-pressurization. A regulated air outlet gauge shall be provided downstream of the regulator to view the regulated pressure.

All gauges provided shall all be liquid filled, 2 1/2", 0-7500 psi. Valves shall be 6000 psi working pressure, soft seat type. The adjustable pressure regulator shall be a one handed, self relieving, 6000 psi type.

At a minimum, the fill control panel shall include the following:

- Air storage fill, CGA inlet fitting and control valve
- Storage bottle gauge(s) and control valve(s)
- Adjustable, self relieving regulator
- Regulator outlet pressure gauge
- SCBA cylinder(s) fill control valve

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- SCBA cylinder(s) fill pressure gauge

All panel components shall be clearly marked with permanently affixed, engraved nameplates.

The cascade containment fill station shall be located in Compartment L3.

****120/240 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ****

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

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

OPERATIONAL TESTING

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

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

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HYDRAULIC DRIVEN GENERATOR

The generator system shall be an Onan model RBAB 6000 GenSet, PTO/Hydraulic, rated at 6,000 watts, 50/25 amps @120/240 VAC, single phase generator. The generator shall maintain a 60 Hz frequency between 850 and 3000 rpm.

The generator shall consist of hydraulic motor, alternator, cooling fan and a heat exchanger in a stainless steel housing. The reservoir shall be a 3-gallon hydraulic tank with an integral filter, gauge, temperature switch, breather and fill port.

The Onan limited warranty covers virtually everything except routine maintenance for the first five (5) years or the first 1000 hours of operation.

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A "power on" indicator light shall be provided at the breaker panel box to notify the operator when the generator is producing electricity.

120/240 VOLT WIRING

The generator output conductors shall be 10 gauge and the output conductors shall be routed through non-metallic conduit 1/2" in diameter.

120/240 VOLT DISPLAY

The digital Onan display shall be by FRC and shall display Hz, voltage, amperage, oil temperature and hours. The meter shall be installed near the breaker panel.

ONAN GENERATOR STEPPING SURFACE

Onan #026-00492 Non Skid Steel Diamond Plate overlay shall be installed on top of the Onan hydraulic generator to provide a non-slip walking surface.

GENERATOR PTO

A hot shift PTO shall be provided on the transmission for the Onan generator. The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator shall have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

GENERATOR RUNNING LIGHT

A 120 volt generator running light shall be installed on the cab dash.

LINE VOLTAGE ELECTRICAL SYSTEM CERTIFICATION

When the unit successfully meets all the requirements outlined in NFPA 1901, 2016 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with the required line voltage section of NFPA.

GENERATOR LOCATION

The generator shall be permanently mounted in the hose bed.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

120/240 VOLT LOAD CENTER

The generator output line conductors shall be wired from the generator output connections to a Square D, model #QO120L125G breaker panel. The breaker panel shall be equipped with a properly sized main breaker using two (2) of the twenty (20) spaces which leaves a total of eighteen (18) available spaces.

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The generator output conductors shall be sized to 115% of the main breaker rating and shall be installed as indicated in the wiring section.

Twelve (12) appropriately sized, 120 volt, circuit breakers shall be provided.

Three (3) appropriately sized, 240 volt, circuit breakers shall be installed in place of six (6) standard 110 volt circuit breakers.

The breaker panel shall be located on the rear wall of the officer side front compartment.

120/240 VOLT WIRING METHODS

Wiring/conduit shall not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring shall be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports shall be of nonmetallic material or corrosion protected metal. All supports shall not cut or abrade conduit or cable and shall be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment shall be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing shall be provided.

The installation of all 120/240 wiring shall meet the current NFPA-1901 Standards .

120/240 VOLT WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box shall be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends shall be labeled showing function and wire size.

120/240 VOLT GROUNDING

The neutral conductor of the power source shall be bonded to the vehicle frame only at the power source.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. The conductor shall have a minimum amperage rating of 115 percent of the name plate current rating of the power source specification label.

120/240 VOLT CIRCUIT BREAKER / RECEPTACLE INSTALLATION

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The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits shall be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

120/240 VOLT RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

One (1) 3' long outlet strip shall be installed at a location TBD by the customer. Each outlet strip shall have four (4) duplex household receptacles.

The outlet strip shall require a 120 volt circuit breaker to be installed in the load center to properly protect the circuit.

One (1) 240 volt, NEMA L6-30, 30 amp, single twist-lock receptacle with a gray thermoplastic, corrosion resistant, weatherproof cover shall be installed adjacent to the circuit breaker panel.

The receptacle shall require one (1) 30 amp, 240 volt circuit breaker to be installed in the load center.

ELECTRIC CABLE REELS

Two (2) Hannay Model #ECR-1616-17-18, 120 volt, electric rewind cord reels shall be provided and wired to the breaker panel. The reels shall be securely mounted and equipped with a rewind controls adjacent to each reel.

The cord reels shall be mounted above the pump enclosure with one (1) on the officer side and the second (2nd) reel mounted in the driver side rear compartment rear wall as high as possible mounted.

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

One (1) reel rewind switch(s) shall be provided on the compartment wall

One (1) Hannay 4-way stainless steel roller assembly shall be provided. The roller assembly opening shall be the full width of the reel drum.

ELECTRIC CABLE

Two hundred (200) feet of Type SO yellow 12/3 heavy duty electric cable shall be provided on each of the reels.

One (1) NEMA L5-15R, 15 amp, three prong twist-lock receptacle shall be provided on the end of the cable.

JUNCTION BOX(ES)

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Two (2) Circle-D Model #PF51G-3P, four (4) outlet junction box(es) with four (4) NEMA L5-15R twist-lock receptacles with a 12" pigtail with a NEMA L5-15P twist-lock plug shall be provided.

Two (2) holder(s) constructed from 1/8" aluminum tread plate shall be provided for each cord reel(s) junction box. The location of the holder shall be adjacent to the cord reel roller assembly or as directed by the fire department.

LIGHTING (TELESCOPING) - REAR OF CAB

Two (2) Fire Research Spectra, model #SPA530 side mounted, push up scene light, deployable in a full 360 degree rotation. The entire assembly shall be UL listed as Scene light for Fire Service Use, manufactured by Fire Research. The tightening mechanism shall be of a twist lock (concentric ring) design, the use of a knob or latch to release the pole in order to raise and lower the telescoping portion of the pole shall not be accepted.

The lights shall be mounted on the rear of the cab, one (1) each side. Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Each Fire Research light shall be equipped with sixty (72) ultra-bright white LEDs, 60 for flood lighting and 12 to provide a spot light beam pattern. It shall operate at 120 volts AC, draw 2.8 amps, and generate 28,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5 3/8" high by 14" wide by 3 3/4" deep and have a heat resistant handle. The lamphead and mounting arm shall be powder coated. The LED scene light shall be for fire service use.

Two (2) model K28 heads shall require one (1) 120V, 15 amp circuit breaker.

The rear of cab lights shall be controlled from the following location(s):

- Pump panel, with 12 volt switch

LADDER STORAGE

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments, on the officer side of the apparatus.

To secure the ground ladders, a hinged rear access door shall be provided and tied into the "Do Not Move Apparatus" warning system.

LADDER SCUFF PLATE

The ladder access door shall have an aluminum diamond plate panel on the inner surface of the door.

GROUND LADDERS

The following Alco-Lite ground ladder complement shall be provided:

- One (1) Alco-Lite model PEL3-30; 30', aluminum, three (3) section extension ladder shall be provided.

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- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks shall be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ******

PIKE POLE STORAGE

Two (2) pike pole tube(s) shall be provided. Each holder shall be accessible from the rear of the apparatus. Each pike pole holder shall be labeled to indicate the pike pole length.

The pike pole tube(s) shall be mounted in the suction hose storage compartment.

SUCTION HOSE STORAGE

The suction hoses shall be located beneath the hose bed, one (1) on the driver side and one (1) on the officer side. The hose storage area shall be accessed from the rear of the apparatus. The storage area shall be enclosed with a hinged door on the rear of the body that shall be tied into the "Do Not Move Apparatus" warning system.

Note: On bodies with roll up style doors this storage area shall be behind the roll of the door and will not affect usable compartment space. On bodies with hinged style doors this storage area shall be in the top corner of the compartment.

SUCTION HOSE

Two (2) 12 foot sections of six (6) inch PVC lightweight suction hose shall be furnished (Kochek or Firequip Maxi-Flex). Suction hose shall be for suction only and not to be used on pressurized hydrants or for relay pumping. Couplings shall include a long handle, female swivel on one end and a rocker lug male on the other end. All threads shall be six (6) inch N.S.T.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

STRAINER

One (1) 6" NST, Red Head 140-60001 barrel type strainer(s) shall be provided to attach to the suction hose. A compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

EQUIPMENT CLARIFICATION

The NFPA-1901 recommended double female hydrant adapter shall not be provided by the apparatus manufacturer.

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts

LOOSE EQUIPMENT

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The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

EQUIPMENT MOUNTING ALLOWANCE

Green LED lights will be installed on each side of the pump panel.

Dividers will be installed in the front bumper to isolate the hydraulic pump and hoses.

A hydraulic combi tool will be mounted as directed on the front bumper.

A FD supplied Survivor bank charger for hand-lights will be installed in the cab.

Between the officer seat and the rear crew seat there will be an aluminum plate and the FD supplied thermal image camera will be mounted.

****** PAINT SECTION ******

PAINT, PREPARATION AND FINISH

The apparatus body shall be painted Sikkens [#COL]. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

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Any location where the material is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

"TUF-KOTE" UNDER SEAL

The under side of the apparatus shall have Tectyl # 518 film applied to retard rust and the corrosion process. The product shall meet military Specification A-A-59295 Type 1. The amber, semi-firm wax film shall be applied by air spray method. The cure time is 24 hours. The film shall be applied to the chassis major components such as: chassis frame rails and cross members, axles, springs, drive line components, lower radiator supports, fuel tank, air tanks, running boards, bumper apron and other related components.

The under side of the cab and body shall have the film applied to the following areas: cab steps, front gravel shield and underside of battery box, body substructure, underside of all body compartments, running board supports and rear step supports. No film shall be applied to the exhaust system or cab wheel wells, or body rear wheel wells.

NOTE: The film shall remain semi-firm to promote self-sealing. The film may leave a light amber cast to those areas treated.

BODY PAINT

The inside and underside areas of the complete body assembly shall be painted black using a Sikkens paint system, prior to the installation of the body on the chassis or torque box.

COMPARTMENT PAINT

The interior of the compartments shall be finish painted with Multispec #7247 White Marble Stone scuff resistant paint to provide a protective application over all of the compartment interior surfaces.

BODY PAINT

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The body paint finish shall be Sikkens paint system in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted black.

FENDER STORAGE COMPARTMENT PAINT

The interior of the fender storage compartments (if fender compartments are specified) shall be finish painted with Multispec #7247 White Marble Stone finish to provide a protective finish.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self etching, corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two component polyurethane, primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior shall be painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located on the cab roof, same as the existing KME pumper.

***C/S See image in QW.

There shall be NO pinstripe located on the two-tone paint break line on the cab.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be painted using dark gray Line-X material.

CHASSIS PAINT

The chassis frame rails, suspension and axles shall be painted black with a Polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

WHEEL PAINT

The chassis wheels, (except aluminum wheels) shall be painted job color with silver trim around the perimeter.

PAINT CODES

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The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

Single Color: Lime Yellow Paint Code# 40 (match Sikkens Autocoat LV)

- **SECONDARY PAINT COLOR**

Two/Tone Color: Green Met Paint code# 160 (match Sikkens Autocoat LV)

A spray out must be sent and signed off on for approval.

TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit shall be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing shall be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

****** LETTERING AND STRIPING ******

LETTERING

The sales representative shall supply all gold leaf or equal lettering, decals, special emblems and non NFPA required striping.

GOLD LEAF LETTERING AND STRIPING

Genuine 23-karat Gold Leaf lettering and NFPA striping shall be applied to the apparatus by an artist.

An allowance has been included in the Bid Proposal Price for Gold Leaf lettering and striping. Any lettering costs above this figure will be borne by the Purchaser.

The lettering and striping will conform to the Fire Department specifications and requirements. The final layout will be discussed at an in-process inspection.

NFPA SCOTCHLITE STRIPE

The sales representative shall supply the NFPA required ScotchLite striping.

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REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

The striping shall be 6" Oralite reflective striping.

The Oralite V98 reflective tape shall be red and fluorescent yellow in color.

******* WARRANTIES & REQUIRED INFORMATION *******

KME WARRANTY, STARTING ON DELIVERY DATE

Warranty coverage by KME will begin on the date of delivery to the customer.

WARRANTY - KME CHASSIS

The proposed vehicle includes a **two (2) year** new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of two (2) years from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

WARRANTY - ENGINE

The proposed unit will be equipped with a Fire Service rated engine, which will come furnished with a five (5) year Engine Manufacturer's warranty. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - TRANSMISSION

The proposed Allison transmission will be provided with a five (5) year warranty. A copy of the Allison transmission warranty will be supplied to the purchaser to define additional details of the warranty provisions.

WARRANTY - COOLING SYSTEM - CUSTOM CHASSIS

Kovatch Mobile Equipment (KME) warrants all Cooling System Equipment components used in the construction of KME Fire Apparatus against defects and workmanship provided the apparatus is used

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in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of three (3) years from the date of delivery / acceptance to the original user-purchaser, which ever occurs first.

This warranty applies to both purchased and fabricated, manufacturer supplied, coolant system components, and is not provided in lieu of any Vendor provided warranties. All coolant system components provided by the engine manufacturer are covered by the engine manufacturer's warranty only.

WARRANTY - CUSTOM CHASSIS FRAME RAILS

The proposed KME custom chassis frame and cross members will be warranted to the original purchaser for the life of the vehicle. A copy of KME's frame rail warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - STEERING UNIT

The proposed Sheppard steering gear will be warranted for a period of three(3) years from the first date of service or 150,000 miles (241,401 kilometers), whichever occurs first. The product will be free from defects in material and workmanship under normal use in applications approved in advance by Sheppard.

WARRANTY - FRONT AXLE

The Meritor axle will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - REAR AXLE

The Meritor axle will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - ABS

The Meritor ABS will be provided with a three (3) year warranty, parts and labor. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions. Vehicles that operate full or part time outside the United States and Canada will have a one (1) year, parts only warranty.

WARRANTY - CAB STRUCTURE

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - BODY STRUCTURE

The proposed body will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

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WARRANTY - CORROSION

The proposed cab and body will be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

WARRANTY - PAINT

The proposed paint finish will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - STAINLESS STEEL PLUMBING WARRANTY

The proposed stainless steel plumbing will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - REAR SUSPENSION

ReycoGranning(The Company) warrants suspension products manufactured by it to be free from defects in material and workmanship which occur under normal use and service for a period of one(1) year.

This warranty will not apply and no warranty of any kind shall exist as to any product which has been subject to abuse, misuse, neglect, misapplication or accident of any type or cause or which has been repaired, replaced, substituted or used with parts other than genuine parts of The Company or altered by anyone.

WARRANTY - WATER TANK

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - FIRE PUMP

Waterous warrants, to the original Buyer only, that products manufactured by Waterous will be free from defects in material and workmanship under normal use and service for a period of five (5) years from the date the product is first placed in service or five and one-half (5 1/2) years from the date of shipment by Waterous, whichever period will be the first to expire; provided the buyer notifies Waterous, in writing, of the defect in said product within the warranty period, and said product is found by Waterous to be nonconforming with the aforesaid warranty.

WARRANTY - HEAVY DUTY VALVES

Akron Brass warrants Heavy Duty Swing-Out Valves for a period of ten (10) years after purchase against defects in material or workmanship. Akron Brass will repair or replace any Heavy Duty Swing Out Valve which fails to satisfy this warranty.

WARRANTY - GENERATOR

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The proposed generator will have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty will be provided at time of delivery.

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition in accordance with the applicable requirements unless supplied by the manufacturer or sales rep organization, 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.

Section 5.7 Equipment

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.1 Ground Ladders.

5.7.1.1 All fire department ground ladders carried on the apparatus shall meet the requirements of NFPA 1931, Standard for Manufacturer's Design of Fire Department Ground Ladders, except as permitted by 5.7.1.3 and 5.7.1.4.

5.7.1.2 At a minimum, the following fire department ground ladders shall be carried on the apparatus:

- (1) One straight ladder equipped with roof hooks
- (2) One extension ladder
- (3) One folding ladder

5.7.1.3 Stepladders and other types of multipurpose ladders meeting ANSI A14.2, Ladders - Portable Metal- Safety Requirements, or ANSI A14.5, Ladders - Portable Reinforced Plastic Safety Requirements, with duty ratings of Type IA or IAA shall be permitted to be substituted for the folding ladder required in 5.7.1.2(3).

5.7.1.4 Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in 5.7.1.2 provided they meet either ANSI A14.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Section 5.7.2 Suction Hose or Supply Hose.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.2.1 A minimum of 20 ft (6 m) of suction hose or 15 ft (4.5 m) of supply hose shall be carried.

5.7.2.1.1 Where suction hose is provided, a suction strainer shall be furnished.

5.7.2.1.2 Where suction hose is provided, the friction and entrance loss of the combination suction hose and strainer shall not exceed the losses listed in Table 16.2.4.1 (b) or Table 16.2.4.1(c).

5.7.2.1.3 Where supply hose is provided. It shall have couplings compatible with the local hydrant outlet connection on one end and the pump intake connection on the other end.

5.7.2.2 Suction hose and supply hose shall meet the requirements of NFPA 1961, Standard on Fire Hose.

Section 5.8 Minor Equipment

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.8.2 Fire Hose and Nozzles. The following fire hose and nozzles shall be carried on the apparatus:

- (1) 800 ft (240 m) of 2 1/2 in. (65 mm) or larger fire hose
- (2) 400 ft (120 m) of 1 1/2 in. (38 mm), 1 3/4 in. (45 mm), or 2 in. (52 mm) fire hose

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- (3) One hand line nozzle. 200 gpm (750 L/min) minimum
- (4) Two hand line nozzles. 95 gpm (360 L/min) minimum
- (5) One lay pipe with shutoff and 1 in. (25 mm), 1 1/8 in. (29 mm), and 1 1/4 in. (32 mm) tips

5.8.3 Miscellaneous Equipment. The following additional equipment shall be carried on the apparatus:

- (1) One 6 lb (2.7 kg) flathead axe mounted in a bracket fastened to the apparatus
- (2) One 6 lb (2.7 kg) pick head axe mounted in a bracket fastened to the apparatus
- (3) One 6 ft (2 m) pike pole or plaster hook mounted in a bracket fastened to the apparatus
- (4) One 8 ft (2.4 m) or longer pike pole mounted in a bracket fastened to the apparatus
- (5) Two portable hand lights mounted in brackets fastened to the apparatus
- (6) One approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus
- (7) One 2 1/2 gal (9.5 L) or larger water extinguisher mounted in a bracket fastened to the apparatus
- (8) One self-contained breathing apparatus (SCBA) complying with NFPA 1981, Standard on Open-Circuit Self Contained Breathing Apparatus (SCBA) for Emergency Services, for each assigned seating position. But not fewer than four, mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer
- (9) One spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space
- (10) One first aid kit
- (11) Four combination spanner wrenches mounted in brackets fastened to the apparatus
- (12) Two hydrant wrenches mounted in brackets fastened to the apparatus
- (13) One double female 2 1/2 in. (65 mm) adapter with National Hose (NH) threads, mounted in a bracket fastened to the apparatus
- (14) One double male 2 1/2 in. (65 mm) adapter with NH threads, mounted in a bracket fastened to the apparatus
- (15) One rubber mallet, suitable for use on suction hose connections, mounted in a bracket fastened to the apparatus
- (16) Two salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m)
- (17) Two or more wheel chocks. Mounted in readily accessible locations, that together will hold the apparatus. When loaded to its GVWR or GCWR, on a hard surface with a 20 percent grade with the transmission in neutral and the parking brake released
- (18) One 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
- (19) Five fluorescent, orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band
- (20) Five illuminated warning devices such as highway flares, unless the live fluorescent orange traffic cones have illuminating capabilities
- (21) One automatic external defibrillator (AED)

5.8.3.1 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, shall be carried mounted in brackets fastened to the apparatus.

5.8.3.2 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 shall be carried. Any intake connection larger than 3 in. (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.

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- 5.8.3.3 If the pumper is equipped with an aerial device with a permanently mounted ladder, four ladder belts meeting the requirements of NFPA 1983, Standard on Life Safety Rope and Equipment for Emergency Services shall be provided.
- 5.8.3.4 If the apparatus does not have a 2 1/2 in. intake with NH threads, an adapter from 2 1/2 in. NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- 5.8.3.5 If the supply hose carried has other than 2 1/2 in. NH threads, adapters shall be carried to allow feeding the supply hose from a 2 1/2 in. NH thread male discharge and to allow the hose to connect to a 2 1/2 in. NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

14.1.8.4 Fire Helmet.

It is the responsibility of the purchaser to ensure that "Fire helmets shall not be worn by persons riding in enclosed driving and crew areas any time the apparatus is placed in service.

14.1.8.4.1 A location for helmet storage shall be provided.

14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

14.1.10 SCBA Mounting.

It is the responsibility of the purchaser to ensure that any SCBA equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

14.1.10.1 Where SCBA units are mounted within a driving or crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall be provided such that the SCBA unit cannot be retained in the mount unless the positive latch is engaged.

14.1.10.2 The bracket holding device and its mounting shall retain the SCBA unit when subjected to a 9 G force and shall be installed in accordance with the bracket manufacturer's requirements.

14.1.10.3 If the SCBA unit is mounted in a seat back, the release mechanism shall be accessible to the user while seated.

14.1.11 Equipment Mounting.

It is the responsibility of the purchaser to ensure that any equipment installed on the apparatus by them or their subcontractor meets the following requirements prior to placing it in service.

14.1.11.1 All equipment required to be used during an emergency response shall be securely fastened.

14.1.11.2 All equipment not required to be used during an emergency response, with the exception of SCBA units, shall not be mounted in a driving or crew area unless it is contained in a fully enclosed and latched compartment capable of containing the contents when a 9 G force is applied in the longitudinal axis of the vehicle or a 9G force is applied in any other direction, or the equipment is mounted in a bracket(s) that can contain the equipment when the equipment is subjected to those same forces.

Section 15.9.3 Reflective Striping.

It is the responsibility of the purchaser to ensure that Reflective Striping has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

15.9.3.1" A retro reflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.

15.9.3.1.1 The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

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15.9.3.1.2 The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

15.10 Hose Storage.

It is the responsibility of the purchaser to ensure that any hose storage area includes a positive means to prevent unintentional deployment in order to achieve compliance with the standard prior to placing it in service.

15.10.7 Any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, sides, front, and rear of the hose storage area while the apparatus is underway in normal operations.