FRONT RANGE FIRE APPARATUS

7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com

DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com

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PROPOSAL FOR FURNISHING FIRE APPARATUS

January 01, 2016

Town of Castle Rock
100 N. Wilcox Street
Castle Rock, CO 80104

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Pierce Manufacturing, Inc., at its home office in Appleton, Wisconsin, the apparatus and equipment herein named and for the following prices:

(1) One Pierce Velocity Pumper (HGAC FS12-15) **$ 643,684.60**
Per the attached proposal
Delivery 11.5 to 12.5 months

Prepayment Options

Chassis Pre-Payment ($365,604.00) **Deduct ($10,955.00)**
Due within Net 30 Days of signed contract

100% Pre-Payment **Deduct ($24,500.00)**

Total $ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 11.5 to 12.5 months after receipt of this order and the acceptance thereof at our office at Appleton, Wisconsin, and to be delivered to you at Castle Rock, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The proposal for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

PIERCE MANUFACTURING, INC.

By: _____
Duane Doucette
SALES REPRESENTATIVE

Helping Governments Across the Country Buy
PO Box 22777 • 3555 Timmons Ln. • Houston, Texas 77227-2777• 1-800-926-0234

CONTRACT PRICING VERIFICATION

TO:	FROM:
Tad Keegan	**Jackie Palmer**
COMPANY:	DATE:
Town of Castle Rock	**3/15/2016**
PHONE NUMBER:	PHONE NUMBER:
	713-993-2466
RE:	
Price Verification	Contract Pricing Worksheet dated 1/1/2016

We have reviewed the pricing worksheet provided through HGACBuy Contract FS12-15. Our review verifies that the pricing provided is in compliance with the contract.

Please advise if we can assist further in this matter.

******This is not an Order Confirmation********

HGACBuy	CONTRACT PRICING WORKSHEET For MOTOR VEHICLES Only	Contract No.:	FS12-15	Date Prepared:	1/1/2016

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

Buying Agency:	Town of Castle Rock	**Contractor:**	Pierce Manufacturing Inc.
Contact Person:	Tad Keegan	**Prepared By:**	Duane Doucette
Phone:	(303) 660-1066	**Phone:**	303-304-9911 x21
Fax:		**Fax:**	303-449-1203
Email:	TKeegan@crgov.com	**Email:**	duaned@frontrangefire.com

Product Code:	**TC06**	**Description:**	**Velocity Pumper**

A. Product Item Base Unit Price Per Contractor's H-GAC Contract:	384990

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
		Subtotal From Additional Sheet(s):	252697
		Subtotal B:	252697

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
		Subtotal From Additional Sheet(s):	5997.6
		Subtotal C:	5997.6

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B).	**For this transaction the percentage is:**	1%

D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C)						
Quantity Ordered:	1	**X Subtotal of A + B + C:**	643684.6	=	**Subtotal D:**	643684.6
E. H-GAC Order Processing Charge (Amount Per Current Policy)					**Subtotal E:**	2000

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

Description	Cost	Description	Cost
		Chassis Pre Payment Discount	-10955
		Discount, HGAC Fee Paid by Vendor	-2000
		Subtotal F:	-12955

Delivery Date:	1/15/2017	**G. Total Purchase Price (D+E+F):**	632729.6

Proposal Option List

3/18/2016

Customer:	Castle Rock Fire Department	**Bid Number:**	669
Representative	Doucette, Duane	**Job Number:**	
Organization:	Front Range Fire Apparatus, Ltd	**Number of Units:**	1
Requirements Manager:		**Bid Date:**	09-15-2015
Description:	Pumper, Med Alum, Velocity	**Stock Number:**	
Body:	Pumper, Med, Alum, 2nd Gen	**Price Level:**	35 (Current: 35)
Chassis:	Velocity Chassis (Big Block), 2010		

Line	Option	Type	Option Description	Qty
1	0671399		Boiler Plates, Pumper Fire Department/Customer - Castle Rock fire Department Operating/In conjunction W-Service Center - Operating Miles - 75 Miles Number of Fire Dept/Municipalities - 10 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location: Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0028079		Match Not Required	1
7	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
8	0533347		Pumper/Pumper with Aerial Device Fire Apparatus	1
9	0588611		Vehicle Certification, Pumper	1
10	0661778		Agency, Apparatus Certification, Pumper/Tanker, U.L.	1
11	0620362		Consortium, HGAC	1
12	0537375		Unit of Measure, US Gallons	1
13	0030006		Bid Bond Not Requested	1
14	0582800		Performance Bond, 100 Percent w/25 Percent Warranty Bond, 1 Yr, and Payment Bond	1
15	0000007		Approval Drawing	1
16	0087832		Drawing, Preliminary Layout, Pump Panel, Control Zone, Reference Only	1
17	0002928		Electrical Diagrams	1
18	0564202		Velocity Chassis (Big Block), 2010	1
19	0021007		Maximum Overall Height Size - Size - 120 inches	1
20	0000110		Wheelbase Wheelbase - Wheelbase - 207.50"	1
21	0000070		GVW Rating GVW rating - GVW rating - 43,500 lbs.	1
22	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
23	0020018		Frame Liner Not Req'd	1
24	0508849		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel	1
25	0010427		Suspension, Front TAK-4, 22,800 lb, Qtm/AXT/Imp/Vel/DCF/Enf	1
26	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
27	0000322		Oil Seals, Front Axle	1
28	0664500		Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply, Fire Service Speed Rtng	1
29	0019611		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot	1
30	0530466		Axle, Rear, Meritor RS26-185, 27,000 lb, Imp/Vel/Dash CF	1
31	0544253		Top Speed of Vehicle, 68 MPH	1
32	0122075		Suspen, Rear, Standens, Spring, 27,000 lb, Imp/Vel/Dash CF	1
33	0000485		Oil Seals, Rear Axle	1
34	0000482		Driver Controlled Differential Lock, Single Axle	1
35	0587216		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Single	1
36	0019625		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Single	1
37	0568081		Tire Balancing, Counteract Beads	1
38	0545391		Tire Pressure Monitoring Valve Cap Qty, Tire Pressure Ind - 6	1
39	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1

Line	Option	Type	Option Description	Qty
40	0001960		Axle Hub Covers, Rear, S/S, High Hat (Pair)	1
41	0002000		Chains, Automatic Tire, ONSPOT, Custom	1
42	0002045		Mud Flaps, w/logo front & rear	1
43	0544802		Chocks, Wheel, SAC-44-E, Folding Qty, Pair - 01	1
44	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal Qty, Pair - 01 Location, Wheel Chocks - Left Side Rear Compt	1
45	0593760		ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010	1
46	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
47	0509206		Brakes, Meritor, EX225, Disc Plus, Rear, Single Axle	1
48	0058463		Air Compressor, Brake, Bendix 15.8 CFM	1
49	0000785		Brake Reservoirs, Three	1
50	0587034		Air Dryer, Bendix, AD-IP w/Heat, 2010	1
51	0000790		Brake Lines, Nylon	1
52	0000854		Air Inlet, w/Disconnect Coupling Location, Air Coupling(s) - a) DS Step Well Qty, Air Coupling (s) - 1	1
53	0000860		Outlet, Air, with shut off valve Location, Air Coupling(s) - a) DS Step Well Qty, Air Coupling (s) - 1	1
54	0004200		Hose, Air 25' length, w/air chuck Qty, - 1	1
55	0014130		Air Tank, Additional for Extra Air Horn Capacity	1
56	0610849		Engine, DDC DD13, 505 hp, 1750 lb-ft, W/OBD, EPA 2016, Velocity	1
57	0001244		High Idle w/Electronic Engine, Custom	1
58	0590300		Engine Brake, Jacobs Compression Brake, DD13 Switch, Engine Brake - f) DD13	1
59	0552334		Clutch, Fan, Air Actuated, Horton Drive Master	1
60	0123135		Air Intake, w/Ember separator, Imp/Vel	1
61	0565965		Exhaust System, 5", 2010 DD13, ISX engine, Horizontal, Officer Side	1
62	0521150		Exhaust, Modified for Nederman System, 7.00", 2007/2010 Engines	1
63	0557543		Radiator, Impel/Velocity	1
64	0616439		Cooling Hoses, Gates Silicone	1
65	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
66	0001129		Lines, Fuel	1
67	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle Door, Material & Finish, DEF Tank - Polished Stainless	1
68	0552793		Not Required, Fuel Priming Pump	1
69	0552712		Not Required, Shutoff Valve, Fuel Line	1
70	0553019		Cooler, Engine Fuel, Imp/Vel, AXT/Qtm/Sab/DCF/SFR/Enf	1
71	0690880		No Selection Required From This Category	1
72	0642533		Trans, Allison 5th Gen, 4500 EVS P, w/Prognostics, Imp/Vel/DCF/Enf	1
73	0512762		Transmission, Shifter, 6-Spd, Push Button, 4500, Imp/Vel/Qtm/DCF/Enf Trans, ratio - 4500 EVS, 6Spd	1
74	0684459		Transmission Oil Cooler, Modine, External	1
75	0001375		Driveline, Spicer 1810	1
76	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
77	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
78	0509230		Steering Wheel, 4 Spoke without Controls	1
79	0690274		Logo/Emblem, on Dash Text, Row (1) One - Castle Text, Row (2) Two - Rock Text, Row (3) Three - Fire Department	1
80	0569141		Bumper, 13" Extended, Steel Painted, Imp/Vel	1
81	0616511		Tray, Hose, Center, 13" Bumper, Outside Air Horns, Imp/Vel Grating, Bumper extension - Grating, Aluminum Capacity, Bumper Tray - 28) 25' of 5.00"	1
82	0633479		Hose Restraint, Bumper Tray, Velcro Straps, Pair Qty, Pair - 01	1
83	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1

Line	Option	Type	Option Description	Qty
84	0082252		Tow Eyes, Painted, Chicago Style, Top of Deck Paint Color, Predefined - Same color as frame	1
85	0660435		Coating, Top Flange, Front Bumper, Outside Exterior, Rhino Lining, Black	1
86	0668315		Cab, Velocity FR, 7010 Raised Roof	1
87	0668309		Engine Tunnel, ISL and DD13, Impel/Velocity FR	1
88	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
89	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
90	0123176		Grille, Bright Finished, Front of Cab, Impel/Velocity	1
91	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab Material Trim/Scuffplate - c) S/S, Polished	1
92	0646179		Trim, S/S, Rect Headlights, VEL/IMP Material Trim/Scuffplate - c) S/S, Polished Turnsignal Covers - No Covers	1
93	0087357		Molding, Chrome on Side of Cab	1
94	0521669		Mirrors, Retrac, West Coast Style, Htd/Rmt, w/Htd/Rmt Convex	1
95	0561587		Mirror, Blind Spot Convex (Grote Brand) @ PS Cab Roof Corner	1
96	0667921		Door, Half-Height, Velocity FR 4-Door Cab, Raised Roof	1
97	0655511		Door Panel, Brushed Stainless Steel, Impel/Velocity 4-Door Cab	1
98	0667905		Storage Pockets w/ Elastic Cover, Recessed, Impel/Velocity FR	1
99	0667902		Controls, Electric Windows, All Cab Doors, Impel/Velocity FR	1
100	0512419		Electric Door Locks, Cab Doors, Imp/Vel	1
101	0555485		Steps, 4-Door Full Tilt Cab, Std, Imp/Vel	1
102	0673090		Lights, Cab and Crew Cab Access Steps, Whelen 3SC0CDCR LED 3.00", 4lts	1
103	0005772		Fenders, S/S on cab, w/Radius corner, 2.00" wide	1
104	0592071		No Windows, Side of Crew Cab, Vel/Imp	1
105	0568605		Not Required, Interior Trim, No Cab Side Windows	1
106	0012090		Not Required, Windows, Front/Side of raised roof	1
107	0509287		Windows, Rear CC, (2) 8" x 14", Velocity	1
108	0553196		Trim, Cab Rear Windows, Velocity	1
109	0652313		Tint, Windows, Crew Cab Doors Only, Raised Roof, 44%, Custom	1
110	0617823		Compt, Storage, 10.71 W x 19.25 H x 22 D, (1) Ea Side C/C, Mini D-Ring, Imp/Vel Light, Aux Cab Compartments - Not Required	1
111	0650737	SP	Drug Locker, Knox, MedVault® 2, WiFi Enabled, Surface Mounted Location - location determined at pre-construction	1
112	0667945		Cab Interior, Vinyl, Velocity FR Color, Cab Interior Vinyl/Fabric - c) Black	1
113	0667943		Cab Interior, Paint Color, Impel/Velocity FR Color, Cab Interior Paint - d) red	1
114	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
115	0667936		Heater/defroster, Dual Zone Control, Impel/Velocity FR	1
116	0603346		Air Conditioning, Dual Zone Control, Hinge Acc Panel, Impel/Velocity FR Paint Color, A/C Condenser - Cover/Mounts Match Roof	1
117	0032085		Fan, Window Defrost, Two (2), Location Feature Location - each side on the overhead console	1
118	0639675		Sun Visor, Smoked Lexan, AXT, Dash CF, Imp/Vel, Saber FR/Enforcer Sun Visor Retention - No Retention	1
119	0543257		Grab Handles, Driver Door Post & Passenger Dash Panel, Imp/Vel	1
120	0012527		Lights, Engine Compt, (2), All Custom Chassis	1
121	0122516		Fluid Check Access, Imp/Vel	1
122	0657480		Box, Storage, Aluminum, Hinged Side, Latex Gloves Location - two in the cab and two in the crew cab Qty, - 04 Z Size, High -	4
123	0585746		Map box, 9 bin, AXT, VEL/IMP Location - rear of engine tunnel Z Size, High -	1
124	0583042		Side Roll and Frontal Impact Protection	1
125	0622619		Seating Capacity, 4 Seats	1
126	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
127	0587668		Seat, Officer, Pierce PS6, Base, SCBA, Safety	1
128	0510037		Radio Compartment, Below Officer Seat, Imp/Vel	1

Line	Option	Type	Option Description	Qty
129	0644971		Cabinet, EMS, Rear Facing, DS, 26.75 W x 40.50 H x 30.50 D, Web, Lock Ext Acc Light, Short EMS Compt - Pierce, Both Sides	1
130	0102783		Not Required, Seat, Rr Facing C/C, Center	1
131	0617440	SP	Cabinet, EMS, Rear Facing, PS, 24.50 W x 40.50 H x 26.50 D, Web, Lock Ext Acc Light, Short EMS Compt - Pierce, Both Sides	1
132	0199328		Seat, Forward Facing C/C, DS Outboard, Pierce PS6, Base Safety, SCBA, Foldup	1
133	0628818	SP	Cabinet, EMS, Forward Facing, Center, 34 W x 52 H x 24 D, Imp/Vel PUC Door, EMS Cabinet - Amdor Roll Up, Non-Locking, Anodized False Floor, EMS Cabinet - No False Floor Light, Short EMS Compt - Pierce, Both Sides	1
134	0199326		Seat, Forward Facing C/C, PS Outboard, Pierce PS6, Base Safety, SCBA, Foldup	1
135	0042264		Shelf, Adjustable, EMS Compt, 1.25" Lip Qty, Shelf - 03 Location, Shelf, EMS - (1) DS Rr Fcng Cabinet, (1) PS Rr Fcng Cabinet and (1) Ctr Fwd Fcng Cabinet	3
136	0097146		Tray, Slide-out, in EMS Cabinet, Floor Mount Location - center forward facing Qty, - 1	1
137	0511300		Upholstery, Seats In Cab, All Imperial 1200, Pierce PS6 Color, Cab Interior Vinyl/Fabric - i) Maroon/Black	1
138	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats Qty, - 03	3
139	0603867		Seat Belt, ReadyReach Seat Belt Color - Red	1
140	0604867		Seat Belt Height Adjustment, 4 Seats, Imp/Vel, Dash CF	1
141	0564727		Bracket, Helmet Holder, On Scene Talon Qty, - 04	4
142	0647647		Lights, Dome, FRP Dual LED 4 Lts Color, Dome Lt - Red & White Color, Dome Lt Bzl - Black Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt Color - Lens Switch	1
143	0650081		Lights, Dome, Whelen, 60C*EGCS Dual LED Location - Officer & Driver Qty, - 01 Color, Dome Lt - Red & White Control, Dome Lt White - Match Crew Cab Switch Control, Dome Lt Color - Match Crew Cab Switch	1
144	0631776		Not Required, Overhead Map Lights	1
145	0678207		Spotlights, Unity 335CL LED Cab, Both Sides	1
146	0555813		Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v, Orange Location, Portable Hand Light - To be determined	1
147	0544516		Spotlight, Handheld Cab, Specialty Lighting 2150-1 Location, Fixed Hand Light - Officer Side Cab	1
148	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010, Dash CF	1
149	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
150	0673123		Light, Do Not Move Apparatus, Whelen 3SR00FRR LED Alarm, Do Not Move Truck - Pulsing Alarm	1
151	0509042		Messages, Open Door/Do Not Move Truck, MUX w/Color Display	1
152	0611681		Switching, Cab, Membrane, Impel/Velocity/Quantum, Dash CF, AXT WiFi MUX Location, Emerg Sw Pnls - Driver and Pass Side Overhead	1
153	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	1
154	0610968		Wiring, Spare, 2.5 A 12V DC, USB Termination Blue Sea 1016 1st Qty, - 01 12vdc power from - Battery direct Location - center dash area	1
155	0548015		Wiring, Spare, 30 A 12V DC 1st Qty, - 01 12vdc power from - Battery direct Wire termination - 10-Place Bus Bar w/Cover Location, Spare Wiring - center forwward facing EMS cabinet on back wall near floor	1

Line	Option	Type	Option Description	Qty
156	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 04 12vdc power from - Battery direct Wire termination - Butt Splice Location, Spare Wiring - two in the front of cab under instrument panel and two in the crew cab tucked in seat riser	4
157	0548009		Wiring, Spare, 20 A 12V DC 1st Qty, - 01 12vdc power from - Battery direct Wire termination - Stud Location, Spare Wiring - in electrical distribution box on the engine tunnel	1
158	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX System Of Measurement - US Customary	1
159	0606247		Vehicle Data Recorder w/CZ Display Seat Belt Monitor	1
160	0709645	SP	Intercom, David Clark, 5-Pos, 3-Radio, (D,O,RPTT),2obC,P Location - forward facing outboard positions	1
161	0637058		David Clark Universal Radio Interfaces Included with Single/Dual System Location, Radio Interface - center overhead position	1
162	0597906		Headset, David Clark, H3441 Under Helmet, Flex Mic, One Slotted Ear Cup Qty, - 04 Location - driver/engineer position	4
163	0505836		Antenna Mount, Custom Chassis, Maxrad BMATM, Location Feature Location - To be determined Qty, - 02 Location, Antenna Cable - officer seat box	2
164	0615100		Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
165	0624254		Electrical System, Velocity	1
166	0079166		Batteries, (4) Exide Grp 31, 950 CCA each, Threaded Stud	1
167	0008621		Battery System, Single Start, All Custom Chassis	1
168	0123174		Battery Compartment, Imp/Vel	1
169	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp	1
170	0012782		Location, Charger, Front Left Side Body Compartment Location, Battery Chrgr/Cmpr - High On Left Wall	1
171	0530951		Location, Battery Charger Indicator, DS Behind Cab Door	1
172	0016820		Shoreline, 15A 120V Qty, - 01 Connection, Shoreline - the battery charger and the six place outlet in the crew cab	1
173	0026800		Shoreline Location Location, Shoreline(s) - DS Seat Riser	1
174	0566294		Alternator, 430 amp, Niehoff C680-1	1
175	0032764		No Auxiliary Power Supply Req'd, Alternator System	1
176	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
177	0648713		Headlights, Rectangular LED, JW Speaker, Imp/Vel	1
178	0648425		Light, Directional, Whelen 600 LED Combination, Cab Corners, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
179	0620054		Light, Directional/Marker, Intermediate, Weldon 9186-8580-29 LED 2lts	1
180	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
181	0591889		Lights, Clearance/Marker/ID, Rear, Whelen 0SR00MCR LED 7Lts	1
182	0564683		Lights, Tail, Whelen M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir Arw For Hsg Color, Lens - Colored	1
183	0561471		Lights, Backup, Whelen M6BUW, LED, For Tail Lt Housing	1
184	0664466		Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp Under Tailbrd Location - driver side	1
185	0556842		Bezels, Whelen, (2) M6 Chrome Pierce, For mtg (4) Whelen M6 lights	1
186	0662814		Bracket, License Plate and Light, P25 LED, Additional Location - driver side rear bulkhead Qty, - 1	1
187	0548618		Alarm, Back-up Warning, Whelen WBUA112	1

Line	Option	Type	Option Description	Qty
188	0644038		Lights, Perimeter Cab, Amdor AY-9500-012 LED 4Dr	1
			Z location -	
189	0617921		Lights, Perimeter Pump House, Amdor AY-9500-020 LED 2lts	1
190	0645995		Lights, Perimeter Body, Amdor AY-9500-020 LED 2lts, Rear Step	1
			Control, Perimeter Lts - DS Switch Panel and Parking Brake Applied	
			Control, Perimeter Lts - DS Switch Panel and Parking Brake Applied	
191	0669077		Lights, Step, Whelen 0AC0EDCR White LED, 45 Deg Chrome Bzl, Park Brake	1
192	0550453		Lights, Side Scene, Zico ZQL-RV-LED, PVC, White 1st	2
			Location, lights - near rear wheels each side	
			Qty, - 02	
			Switch, Lt Control 1 DC,1 - a) DS Switch Panel	
			Switch, Lt Control 2 DC,2 - e) No Control	
			Switch, Lt Control 3 DC,3 - d) No Control	
			Switch, Lt Control 4 DC,4 - d) No Control	
193	0651262		Light, Whelen, 12V PCP2P1 Pioneer LED, Spot/Fldlt, FRC Side Mt, Pull Up Pole 1st	1
			Location, lights - back of cab driver side, with light head positioned to the side	
			Qty, - 01	
			To Do Not Move Truck Lt - a)connected to	
			Switch, Lt Control 1 DC,1 - a) DS Switch Panel	
			Switch, Lt Control 2 DC,2 - e) No Control	
			Switch, Lt Control 3 DC,3 - d) No Control	
			Switch, Lt Control 4 DC,4 - d) No Control	
194	0648871		Light, Whelen, 12V PCP2P1 Pioneer LED, Spot/Fldlt, FRC Side Mt, Pull Up Pole 2nd	1
			Location, lights - back of cab on passenger side, with light head positioned to the side	
			Qty, - 01	
			To Do Not Move Truck Lt - a)connected to	
			Switch, Lt Control 1 DC,1 - a) DS Switch Panel	
			Switch, Lt Control 2 DC,2 - e) No Control	
			Switch, Lt Control 3 DC,3 - d) No Control	
			Switch, Lt Control 4 DC,4 - d) No Control	
195	0618318		Light, Visor, Whelen, 12V PCP2* Pioneer LED Fld/Spt 1st	1
			Qty, - 01	
			Location, driver's/passenger's/center - centered	
			Switch, Lt Control 1 DC,1 - a) DS Switch Panel	
			Switch, Lt Control 2 DC,2 - g) PS Switch Panel	
			Switch, Lt Control 3 DC,3 - d) No Control	
			Color, Wln Lt Housing - White Paint	
196	0015955		Lights, Deck, Unity (2) AG, Rear, Both Flood	1
197	0645676		Lights, Not Required, Hose Bed, Deck Lights At Rear	1
198	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
199	0036960		Switch, Radio Master, w/40 Amp Breaker	1
200	0060115		Pumper, Med, Alum, 2nd Gen	1
201	0554271		Body Skirt Height, 20"	1
202	0013303		Tank, Water, 500 Gallon, Poly, Med, New York Style	1
203	0003405		Overflow, 4" Water Tank, Poly	1
204	0028104		Foam Cell Required	1
205	0023412		Drain, Tank - 1.50"	1
206	0633066		Sleeve through Tank	1
			Qty, Sleeve - 1	
			Water Tank Sleeve - Plumbing/Hydraulic Diameter - 3" Plumbing	
207	0553725		Restraint, Water Tank, Heavy Duty, Special Type Tank, 4x4, or Export	1
208	0003429		Not Required, Direct Tank Fill	1
209	0003424		(No Dump Valve required)	1
210	0048710		Jet Assist Not Req'd	1
211	0030007		(No Dump Chute Required)	1
212	0514778		Not Required, Switch, Tank Dump Master	1
213	0556223		Hose Bed, Aluminum, Pumper, New York Style, Fill In Blank Height	1
			Fill in Blank - 64.00"	
			Material Trim/Scuffplate - b) S/S, Brushed	

Line	Option	Type	Option Description	Qty
214	0003482		Hose Bed Capacity, Additional Capacity, Hosebed - 200' X 1.75", 1,000' X 2.5", 1000' X 5.0", 200' X 2.5", and 200' X 1.75", in addition 150' of 1.75" will lay flat on top of the 600' of 2.5"	1
215	0003488		Divider, Hose Bed, Unpainted Qty, Hosebed Dividers - 4	4
216	0630539	SP	Hose Tray, D/A Aluminum, Removable, Hose Bed Qty, - 03 Size - (1) 200' of 1.75" - (4) 200' of 2.50" - (5) 200' of 1.75" Location, driver's/passenger's/center - driver & passenger	3
217	0003469		Liner, S/S, All Side Walls and Front Wall	1
218	0530804		Cover, Hose Bed, Alum Treadplate	1
219	0587696		Hose Restraint, Hose Bed,One Piece Vinyl Flap,Strap Fastener,Hose bed Frame,Rear Color, Vinyl Cover - a) red Type of fastener - spring clip and hook - bottom of hosebed Type of fastener, Rear - quarter turn - Rear of Hosebed Vinyl flap weight - chain	1
220	0013512		Running Boards, 12.75" Deep	1
221	0689412		Tailboard, 16" Deep, Full Width, Extended Substructure	1
222	0690027		Wall, Rear, Smooth Aluminum/Body Material, Flush Rear Wall	1
223	0003531		Tow Bar, Under Tailboard	1
224	0590926		Hose Restraint, Running Board, Velcro Straps Location, Hose Tray, runn - b) LH Side Qty, Tray, Hose - 1	1
225	0014112		Tray, Hose, Running Board, Special Capacity Location, Hose Tray, runn - b) LH Side Qty, Tray, Hose - 1 Capacity, Hose Tray (Predefined) - 50' of 5"	1
226	0003561		Construction, Compt, Alum, Pumper	1
227	0673878	SP	Eng Compt, Trans, Special Width, 20" W x 42" H, Lap Dr	1
228	0672106	SP	DS 152" Lap, Full Height Front & Rear, Double OTW, FDLER, Special Depth Upper	1
229	0601016	SP	PS 152" Lap, 3/4 Height Front & Rear, (1) Broom, Special Depth Upper, FDLER	1
230	0063911		Doors, Lap w/ "D" Handles - Side Compartments	1
231	0080647		Rear, Rollup, 30.75" FF, 41.88" Deep, Flush Rear	1
232	0692746		Doors, Gortite, Rollup, Rear Compartment Color,Gortite,Roll-upDoor - Satin finish Latch, Gortite, Roll-up - Non-locking Liftbar	1
233	0554995		No Body Modification Required	1
234	0625184		Guard, Drip Pan, S/S, Rollup Door, Pumper Qty, Door Accessory - 01 Location, Door Guard/Drip Pan - R1	1
235	0505888		Keyed Locks for Latches, Lap Doors (#751 Lock) Qty, Door Accessory - 06 Location, Door Accessory - driver side and passenger side body compartments only	6
236	0003919		Reverse Hinge Compartment Door Qty, Door Accessory - 02 Location, Door Accessory - driver and passenger doors forward of the rear wheels	2
237	0616670		Lights, Compt, Pierce LED, Dual Light Strips, Each Side of Door, Pumper/Tanker Qty, - 09 Location, Compartment Lights - All Body Compts	9
238	0610981		Cover, Alum Treadplate, 3/16", Cargo Compt, Special Size Latch, Door, Storage - "D" Handle Latch Location - per sales drawing Hinge, Location - Outboard	1
239	0687146		Shelf Tracks, Painted Qty, Shelf Track - 04 Location, Shelf Track - D3, D1, P1 and P3	4
240	0687112		Shelves, Adjustable, 500 lb Capacity, Full Width/Depth, Painted Qty, Shelf - 08 Location, Shelf - one in each compartment; D1(2), D3(2), P2(1) and R1(1)	8

Line	Option	Type	Option Description	Qty
241	0647091		Tray, Floor Mounted, Slide-Out, 500lb, 2.00" Sides, 2G Qty, - 01 Material - paint to match compt interior Location, Tray Slide-Out, Floor Mounted - R1	1
242	0593193		Enclosure, Tail Lights/Warning Light Mounting, Tailboard	1
243	0561817	SP	Beavertails	1
244	0539811		Box, Poly Tool Location - P1 body Qty, Comp. Accessory - 02 Color - 1) black Length - 22.00" Width - 11.00" Depth - 10.00"	2
245	0539812		Box, Poly Tool, Additional Location - D3 floor Qty, Comp. Accessory - 01 Color - 1) black Length - 22.00" Width - 12.00" Depth - 6.00"	1
246	0656031		Compt, Backboard Storage, Over Pump Size, Backboard - 12" wide X 20" high X 78 " long with a divider 4" from the forward most wall Door, Material & Finish, Storage - Aluminum Treaplate Latch, Door, Storage - Lift and Turn Latch, Pair Qty, Backboard Troughs - 2 Location, BB/Stokes/Long Tool Storage Over Pump - Rearward, Crosslays Access, Backboard/Stokes/Long Tool Compt - Both	1
247	0003908		Partition, Trans Rear Compt Qty, Partition - 02 Location, Partition - c) both sides	2
248	0685337		Tray, Hose, Mounted on Compt Top, w/ (4) Velcro Straps Location - over passenger side body compartment Fill in Blank - Qty. - 1	1
249	0004020		Rub Rail, Stainless Steel	1
250	0004024		Fender Crowns, Rear, S/S	1
251	0600801	SP	Hose, Hard Suction, 5.00", 10.00', Clear Corrugated PVC, w/6.00" Couplings Qty, Hard Suction Hose - 2	2
252	0004090		Troughs, (2), H.S.H., DS High Side Fill in Blank - 4.50" x 10'	1
253	0626229		Handrails, Side Pump Panels, Per Print	1
254	0004126		Handrails, Beavertail, Standard	1
255	0014136		Handrails, Rear, (2), (1) Above and (1) Below Hose Bed Reinforcement, Hose Bed Divider - Not Required	1
256	0514190		Compt, Air Bottle in Fender Panel, Dbl Wide, Full Width, Brushed S/S Door Location, Bracket/comp. - forward of the rear wheels, each side Qty, Air Bottle Comp - 2	2
257	0088099		Insert, Air Bottle Compt, W-Shaped, 2nd Gen Qty, - 02 Fill in Blank - forward of the rear wheels, each side	2
258	0034220		Compt, Extinguisher in Fender Panel Location, Bracket/comp. - rearward of the rear wheels, on passenger side Qty, - 1	1
259	0004224		Ladder, 28' Duo-Safety 1200-A 2-Sect	1
260	0595251		Ladder, 16' Duo-Safety 875-DR Roof, Hooks Both Ends Qty, - 01	1
261	0014308		Rack, Zico Quic-Lift	1
262	0061918		Box, Alum 4-Way to Mount Model 17 Little Giant Ladder w/Straps Location - To be determined	1
263	0014245		Ladder, 10' Duo-Safety Folding 585A, w/Mounting Location, Folding Ladder - a) Right Compt	1
264	0653539		Ladder, Little Giant, Revolution XE 12022 - Model 22 Location - under the hose bed cover	1

Line	Option	Type	Option Description	Qty
265	0004309		Boot, Ladder Color, Ladder boot - b) yellow	1
266	0625843	SP	Trash Hook, 8' Fire Hooks Unlimited, Fiberglass, TRH-8, w/D Handle Location - driver side catwalk Qty, Pike Poles - 1	1
267	0567897		Pike Pole, 8' Fire Hooks Unlimited, New York Roof Hook, Steel, Pry End, RH-8 Qty, - 01	1
268	0552649		Pike Pole, 6' Fire Hooks Unlimited, New York Roof Hook, Steel, Pry End, RH-6 Qty, - 01 Location - on the officer's side, rear exterior wall of the cabin.	1
269	0004361		Tubes, Alum, Pike Pole Storage Qty, Pike Pole Tubes - 02 Location, Pike Pole Tube - Compt Top - DS	2
270	0591177		Steps, Folding, Front of Body, Trident Coating, Step - luminescent	1
271	0592994		Steps, Folding, Rear of Body, w/LED, Trident Coating, Step - luminescent	1
272	0501491		Step, Folding - Extra, Body Only, Luminescent, Trident Qty, Folding Step - 04 Location, Additional Step - on the left bulkheads two (2) each side	4
273	0004465		Pump, Waterous, CMU, 1750 GPM, Two Stage	1
274	0004482		Seal, Mechanical, Waterous	1
275	0559769		Transmission, Pump, Waterous C20 Series	1
276	0635600		Pumping Mode, Stationary Only	1
277	0605126		Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Waterous	1
278	0003148		Transmission Lock-up, EVS	1
279	0004547		Auxiliary Cooling System	1
280	0004485		Transfer Valve, Electric, Waterous	1
281	0004513		Valve, Relief Intake, Waterous, Set @ 125 PSI	1
282	0692045		Controller, Pressure, FRC, Pump Boss, PBA400	1
283	0641712		Primer, Waterous, VPO Motor, (2) VAP Valves, (2) Push Button Controls, w/Tank Inlet Extra Primer - front	1
284	0528229		Drain Locations, Special Instructions	1
285	0058516		Manuals, Pump (2), CD	1
286	0602509		Plumbing, Stainless Steel and Hose, Two Stage Pump, Control Zone	1
287	0064656		Not Required, Black Iron Pipe with Stainless Steel Plumbing	1
288	0004645		Inlets, 6.00" - 1250 GPM or Larger Pump	1
289	0004646		Cap, Main Pump Inlet, Long Handle, NST, VLH	1
290	0550696		Valve, Waterous Monarch w/Relief, DS Side Inlet, 6", Waterous Handwheel Control	1
291	0550697		Valve, Waterous Monarch w/Relief, PS Side Inlet, 6", Waterous Handwheel Control,	1
292	0034651		Short Suction Tube, Passenger Side	1
293	0084605		Valves, Waterous Side with Akron 8000 Series	1
294	0004660		Inlet, Left Side, 2.50"	1
295	0004680		Inlet, Right Side, 2.50"	1
296	0016158		Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone" Qty, Inlets - 2	2
297	0004700		Control, Inlet, at Valve	1
298	0544956		Inlet, 4" to 6" Front, 5" Plumbing, w/Bleeder Valve, Saber, Dash-S, Imp, Vel Inlet, Size - Six Drain, Suction - Swing Handle	1
299	0654014		Control, Front Inlet, Electric, Akron 9323 Controller, w/Override	1
300	0009620		Intake Relief Valve, Front Inlet	1
301	0521688		Not Required, Cap, Long Handle, Front Inlet, Pre-connected Hose	1
302	0048644		Swivel, Smooth Chrome, 6.00" Front Inlet	1
303	0092569		No Rear Inlet (Large Dia) Requested	1
304	0092696		Not Required, Cap, Rear Inlet	1
305	0064116		No Rear Inlet Actuation Required	1
306	0009648		No Rear Intake Relief Valve Required on Rear Inlet	1
307	0500064		Adapter, 6" (FNST) x 5" Storz, Rigid, w/Cap, Front Inlet	1
308	0038167	SP	Interlock, Cab Lift and Front Suction	1
309	0092568		No Rear Auxiliary Inlet Requested	1

Line	Option	Type	Option Description	Qty
310	0563738		Valve, .75" Bleeder, Aux. Side Inlet, Swing Handle	1
311	0029043		Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	1
312	0004905		Outlet, 1.50" Tank Fill	1
313	0004940		Outlet, Left Side, 2.50"	1
			Qty, Discharges - 01	
314	0092570		Not Required, Outlets, Left Side Additional	1
315	0004945		Outlet, Right Side, 2.50"	1
			Qty, Discharges - 01	
316	0092571		Not Required, Outlets, Right Side Additional	1
317	0005047		Outlet, 4.00" w/4.00" Right, Handwheel	1
			Valve, Brand - Akron	
318	0092572		Not Required, Outlet, Front	1
319	0004995		Outlet, Rear, 2.50"	2
			Qty, Discharges - 02	
			Location, Outlet - c) one (1) each side	
320	0044930		Outlet, Rear, 2.50", Additional	2
			Location - one each side	
			Qty, Discharges - 02	
321	0092573		Not Required, Outlet, Hose Bed/Running Board Tray	1
322	0085076		Caps for 1.50" to 3.00" Discharge, VLH	1
323	0563739		Valve, 0.75" Bleeder, Discharges, Swing Handle	1
324	0005091		Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
325	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
326	0025091		Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
327	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
328	0045091		Elbow, Rear Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
329	0076593		Elbow, Rear Outlets, 45 Degree, 2.50" FNST x 2.5" MNST, VLH, Additional	1
330	0005097		Elbow, Large Dia Outlet, 30 Deg, 4.00" FNST x 5.00" Storz	1
			Qty, - 01	
331	0085090		Adapter - 1.50"F NST X 1.50"M Special	2
			Qty, Adapter for Outlets - 02	
			Special Threads - NPSH	
			Location, Adaptor - rear hosebed outlets	
332	0062133		Control, Outlets, Manual, Pierce HW if applicable	1
333	0005066		Outlet, 3.00" Deluge Riser, Special Height	1
			Location - center of cargo area to the rear	
334	0092044		Monitor, TFT Xfire XFC-52, (2) 2.5" Inlets, Package	1
			Monitor Finish - Painted by OEM	
335	0047175		No Additional Nozzle Req'd	1
336	0015072		Deluge Mount, For TFT Crossfire Monitor, XFF-APL, No extend-a-gun	1
337	0025140		Not Required, 1.50" Crosslays	1
338	0029230		Crosslay, (1) 2.50" Spl Cap/Arrangement, Brushed Finished Divider	1
			Capacity, Special Xlay - 300' of 1.75" D.J hose and nozzle	
339	0029260		Not Required, Speedlays	1
340	0591145		Hose Restraint, Crosslay/Deadlay, Top and Ends, Elastic Netting	1
			Qty, - 01	
341	0015180		Roller, Horizl/Vertical, (2) Crosslays	1
342	0035198		Tray(s), Alum, Additional, Speedlays	2
			Qty, - 02	
343	0015216		Reel, Booster, Aluminum - Over Pump, Pass Side	1
344	0011060		Switch, Reel Rewind - One at Pump Panel	1
345	0652763		Hose, Booster - 100' of .75"/800 PSI	1
346	0025244		Capacity, Hose Reel 100' of 1"	1
347	0099703		Nozzle, Task Force, DS 1040	1
			Qty - 1	
348	0005326		Blowout, Hose Reel - Valve at Panel	1
			Qty, - 1	
349	0085328		Nozzle Cup, Zico w/Bracket	1
			Location - to be determined	
			Qty, - 1	
			Size, Nozzle Cup - 3-1/2" I.D.	

Line	Option	Type	Option Description	Qty
350	0624939		Foam Sys, Husky 3, Single Agent, Multi Select Feature Discharge, Foam Locations - Rear outlet left side inboard, Hose Reel in Dunnage Right Side, Rear Outlet Left Side, Rear Outlet Right Side, Crosslay Front and Crosslay Rear Discharge, Foam Locations - Rear outlet left side inboard, Hose Reel in Dunnage Right Side, Rear Outlet Left Side, Rear Outlet Right Side, Crosslay Front and Crosslay Rear	1
351	0012126		Not Required, CAF Compressor	1
352	0592527		Refill, Foam Tank, Integral, Husky 3	1
353	0600980	SP	Label Foam Tank, 40 Gallon Capacity	1
354	0031894		Demonstration, Foam System, At Pierce Vehicle, Qty, Training, P - 3 vehicles	1
355	0005448		Foam Cell, 40 Gallon, Not Reduce Water Type of Foam - Class "A" Foam, Brand Name - To be determined	1
356	0697589		Drain, 1.00", Foam Tank #1, Husky 3 Foam System	1
357	0091079		Not Required, Foam Tank #2	1
358	0091112		Not Required, Foam Tank Drain	1
359	0007545		Pump House, Side Control, 45", Control Zone	1
360	0032479		Pump Panel Configuration, Control Zone	1
361	0005525		Material, Pump Panels, Side Control Brushed Stainless	1
362	0005578		Panel, Pump Access - Pass Side Only	1
363	0035501		Pump House Structure, Std Height	1
364	0559828		Light, Pump Compt, Whelen 20C0CDCD LED Qty, - 01	1
365	0586438		Gauges, Engine - Pump Panel, IAT Pressure Controller	1
366	0005601		Throttle Included w/ Pressure Controller	1
367	0549333		Indicators, Engine, Included with Pressure Controller	1
368	0044860		Test Port, Electronic, Pump RPM, Waterous Pump	1
369	0005690		Gauges, 6.00" Master, Class 1, 30"-0-600psi	1
370	0005715		Gauge, 3.50" Pressure, Class 1, 30"-0-600psi	1
371	0607159		Gauge, Water Level, FRC, WLA 300-A00, TankVision Pro	1
372	0604028		Water Level Gauge, FRC, MaxVision WLA280-A00 Programable Remote Display Location - upper rear corners of the crew cab, to the rear of the crew doors Qty, - 02 Activation, Water Level G - pb) parking brake is applied	2
373	0604354		Gauge, Foam Level, FRC, Tank Vision Pro, WLA 360-A00, Class "A"	1
374	0593143		Light Shield/Step 8" LED w/Weldon Step Light	1
375	0682499		Light Shield/Step 8", PS LED, Weldon Step Light	1
376	0606708		Air Horns, (2) Grover, Stutter Tone, Model 1510, In Bumper	1
377	0606832		Location, Air Horns, Bumper, Left Side, Outside Frame, Same Side (Pos #6 & #7)	1
378	0006066		Control, Air Horn, DS & PS Lanyard	1
379	0505417		Siren, Whelen 295HFSC9, Dual Tone, 200W	1
380	0015283		Location, Elect Siren Location - to be determined	1
381	0076156		Control, Elec Siren, Head Only	1
382	0555705		Speaker, Whelen SA314B w/Polished Flange, 100 watt Qty, Speakers - 2 Connection, Speaker - siren head	2
383	0548457		Location, Recessed in the Front Bumper, Driver and Passenger Side	1
384	0016080		Siren, Federal Q2B	1
385	0602078	SP	Siren, Mechanical, Recessed In Bumper, Flush with Bumper Face Location, Siren, Mech - b) right	1
386	0026163		Control, Mech Siren, DS & PS Foot Sw	1
387	0709894	SP	Lightbar, Whelen, Freedom IV-D, 92", ARRRRWRRRROptRRRRWRRRRA Opticom Priority - b) High Opticom Activation - Roof Light Momentary Opticom Activation - DS Switch Filter, Whl Freedom Ltbrs - No Filters	1

Line	Option	Type	Option Description	Qty
388	0709892	SP	Lightbars, Whelen, Freedom IV- 2-21.5", RRBR RBRR	1
			Lightbar Location, Cab/Crew Cab - cc)over the crew cab doors	
			Filter, Whl Freedom Ltbrs - No Filters	
389	0540460		Light, Front Zone, Whelen M6*C LED, Clear Lens, 4lts Q Bezel	1
			Color, Lt DS Frnt Outside - DS Front Outside Red	
			Color, Lt PS Frnt Outside - PS Front Outside Red	
			Color, Lt DS Front Inside - b) DS Front Inside Blue	
			Color, Lt PS Front Inside - b) PS Front Inside Blue	
390	0653937		Flasher, Headlight Alternating	1
			Headlt flash deactivation - a)w/high beam	
391	0556802		Lights, Side Zone Lower, Whelen M6* LED, Split Color, Clear Lens, 3pr, Ovr 25	1
			Location, lights mid - each side of cab over wheel	
			Location, lights rear - rear fender panel	
			Location, Lights Frt Side - b)each side bumper	
			Color, Lt Side Frnt Split - Red and White	
			Color, Lt Side Mid Split - Red and Amber	
			Color, Lt Side Rear Split - Red and Amber	
392	0553353		Lights, Side, Whelen M6* LED, Split Color, Clear Lens	2
			Location, lights - on the 45 degree angled corners of the bumper extension	
			Qty, - 02	
			Control, light - b) side warning	
			Color, Lt Side Split - Red and White	
393	0505919		Lights, Side, Whelen TIR3, LED, RS*03ZCR Horizontal, Clear Lens, Chrm Flng 1st	1
			Location, lights - one on each side of rear tailboard facing the side	
			Qty, Lights, Pair - 1	
			Color, Lights, Warning - gla) red	
			Control, light - b) side warning	
394	0564654		Lights, Rear Zone Lower, Whelen M6* LED, Colored Lens, For Tail Light Housing	1
			Color, Lt DS Rear - b) DS Rear Lt Blue	
			Color, Lt PS Rear - r) PS Rear Lt Red	
395	0553468		Lights, Rear, Whelen M6* LED, Split Color, Clear Lens	2
			Location - above the tail lights	
			Qty, - 02	
			Control, light - d) separate switch	
			Color, Lt Rear Splt - Amber out Red in	
396	0672975		Light, Rear Zone Upper, Whelen B6MM**1P, Super LED Beacon	1
			Color, Dome, Rear Warning - a)Both domes amber	
			Control, light - a) rear upper warning	
			Color,Whln Sup700 LED - a) rd/rd	
			Color, Lt, Rer Up DS - a) DS Rear Upper Amber	
			Color, Lt, Rer Up PS - a) PS Upper Rear Amber	
397	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
398	0675887		Mtg, Rear Warn Lts, Std Mount, S/S Brkts, Special Location	1
			Location - rear upper corners of hosebed so the whelen 700 series lights are at a 33 degree angle	
399	0529743		Light, Traffic Directing, Whelen TANF85, 45.12" Long LED	1
			Activation, Traffic Dir L - Control Head Only	
400	0529908		Location, Traf Dir Lt, Over Hose Bed Between Body Sheet, On Cross Tube,Trdpt Box	1
401	0530282		Location, Traf Dir Lt Controller, Overhead Switch Panel DS Right End	1
402	0006646		Electrical System, 120/240VAC, General Design	1
403	0602101		Generator, Harrison 3.6 kW Hydraulic, 30A 120VAC Hotshift PTO	1
			Generator Interlocks - No Interlocks	
404	0006645		Location, Hydraulic Generator Above Pump	1
			Location, Generator(s) - Over Pump, Left Side	
405	0016752		Starting Sw, Truck Engine Powered Gen, Cab Sw Pnl	1
406	0016757		Not Required, Remote Start, Generator	1
407	0016740		Not Required, Fuel System	1
408	0016767		Not Required, Oil Drain Extension, Generator	1
409	0016771		Not Required, Routing Exhaust, Generator	1
410	0006738		Circuit Breaker Panel w/Generator	1
			Location, CB Panel - D3 high on rear wall forward	
411	0656242		Light, Whelen P*P*AP1 LED, Folding Tripod 1st	2
			Location, 120/240 Volt Lt - rear beavertails each side	

Line	Option	Type	Option Description	Qty
411			Qty, - 02 Color, Wln Lt Housing - White Paint Lighthead, Wln AC - PFP1AP1, Flood Pole Wln Tripod - 30.00" body, 20.00" Legs Pole Wln Cord - bottm wire exit Receptacle and Plug AC - 20 Amp, 120 Volt Twist Lock Recpt & Plug	
412	0526992		Reel, Elect Cable, Akron, (3) Wire Qty, Cord Reels - 1 Reel Guide - a) Nylatron guide Finish, Reel - Painted Job Color Location, Electric Cord Reel - R1, High & Right, 1 Reel	1
413	0006828		Cord, Electric, 10/3 Yellow, 3 Wire Lengths of Elect Cord - 1 Feet of Yellow Cord - b)100 Connection, Cord - Direct connection	1
414	0016794		Receptacle Strip, 15A 120V 6-Place, Shoreline Location, Receptacles - shipped loose Qty, - 01	1
415	0006790		Receptacle, 20A 120V 3-Pr 3-Wr TL, L5-20R Wtrprf Qty, - 02 AC Power Source - Generator Location, Receptacle(s) - D3 and P3 forward wall just above frame rail height	2
416	0519934		Not Required, Brand, Hydraulic Tool System	1
417	0649753		Not Required, PTO Driven Hydraulic Tool System	1
418	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
419	0047021		Reflective Emergency Triangles, Set of Three Qty, - 1	1
420	0602516		NFPA Required Loose Equipment, Pumper, NFPA 2016, Provided by Fire Department	1
421	0519913		Not Required, Soft Suction Hose	1
422	0007026		Strainer, 5.00"	1
423	0602538		Extinguisher, Dry Chemical, Pumper NFPA 2016 Class, Provided by Fire Department	1
424	0602360		Extinguisher, 2.5 Gal. Pressurized Water, Pumper NFPA 2016,Provided by Fire Dept	1
425	0602679		Axe, Flathead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
426	0602667		Axe, Pickhead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
427	0559573		Paint, Single Color, Custom Paint Color, Predefined - Ford Color F1	1
428	0640911		Paint Chassis Frame Assy, E-Coat, All Joints Sealed Paint Color, Frame Assembly - Black	1
429	0693797		No Paint Required, Aluminum Front Wheels	1
430	0693792		No Paint Required, Aluminum Rear Wheels	1
431	0007230		Compartment, Painted, Spatter Gray	1
432	0544129		Reflective Band, 1"-6"-1" Color, Reflect Band - A - e) black Color, Reflect Band - B - t) gold Color, Reflect Band - C - za) black	1
433	0510041		Reflective across Cab Face, Imp/Vel	1
434	0536954		Stripe, Chevron, Rear, Diamond Grade, Pumper Color, Rear Chevron DG - fluorescent yellow green	1
435	0027341		Jog, In Reflective Stripe, Single or Multiple Qty, - 1	1
436	0009131		Stripe, .25" Reflective Outline on Reflective Band Color, Reflect Band - A - e) black Qty, - 02	2
437	0545179		Stripe, Diamond Grade, Chevron, Front Bumper Size, Chevron Striping - 06 Color, Chevron DG - Yellow Green, Fluorescent Color, Chevron DG - B - Red	1
438	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior Color, Reflect Band - B - t) gold Size, Chevron Striping - 04	1

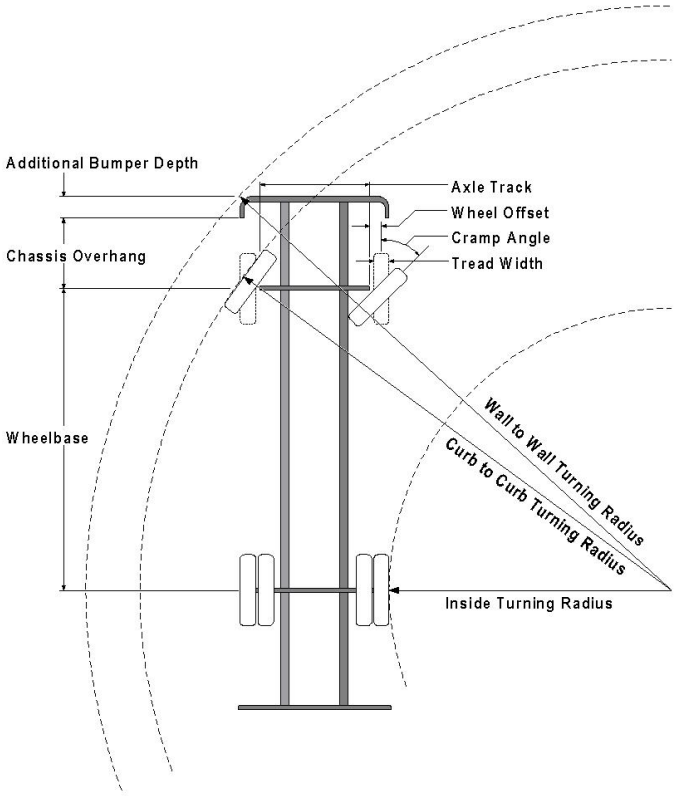
Line	Option	Type	Option Description	Qty
438			Color, Reflect Chev - A - e) black	
439	0033179		Lettering Specifications, Reflective	1
440	0686419		Lettering, Reflective, 3.00", (121-140)	1
			Outline, Lettering - Outline	
441	0684118		Emblem, Monogram w/Scrolling, Reflective, 18"-20", Pair	1
			Qty, - 01	
			Location, Emblem - cab doors	
442	0077162		Emblem, "Star of Life", 10", Reflective, Pair	2
			Qty, - 02	
443	0599008		Rust Proof/Undercoat, Custom Chassis	1
			Color, Undercoating - Black	
444	0000000	STF	Mounting, Customer Equipment	1
444	0000000	STF	Oval Strapping Heron Rib - roll - color 07/07/2014	2
			Qty, - 02	
445	0032773		Manuals, Two (2), Fire Apparatus Parts, & (1) CD, Custom Chassis	1
446	0032421		Manuals, Two (2) Chassis Service & (1) CD, Custom	1
447	0029551		Manuals, Two (2) Chassis Operation, & (1) Compact Disc, Custom	1
448	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
449	0595239		(No Pick Required)	1
450	0696696		Warranty, Engine, Detroit DD13, 5 Year, WA0180	1
451	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
452	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
453	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
454	0530524		Warranty, Axle, 2 Year, Meritor, General Service, WA0046	1
455	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
456	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
457	0595813		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
458	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
459	0647720		Warranty, Pierce LED Strip Lights, WA0203	1
460	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
461	0685945		Warranty, Transmission Cooler, WA0216	1
462	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
463	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
464	0693127		Warranty, Gortite, Roll-up Door, 6 Year, WA0190	1
465	0063510		Warranty, Pump, Waterous, 5 Year Parts, WA0225	1
466	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
467	0657990		Warranty, Foam System, Husky 3, WA0231	1
468	0609981		Warranty, Harrison Generator, 6 Year, WA0285	1
469	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
470	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
471	0683627		Certification, Vehicle Stability, CD0089	1
472	0610837		Certification, Engine Installation, Velocity, Detroit DD13, 2016	1
473	0686786		Certification, Power Steering, CD0098	1
474	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
475	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
476	0548967		Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	1
477	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
478	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
479	0667416		Certification, Cab Heater and Defroster, Velocity/Impel FR, CD0015	1
480	0667415		Certification, Cab Air Conditioning Performance, Velocity/Impel FR, CD0016	1
481	0545073		Amp Draw Report, NFPA Current Edition	1
482	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
483	0000018		PUMPER, 2ND GEN	1
484	0000012		PIERCE CHASSIS	1
485	0562778		DD13 ENGINE	1
486	0046396		EVS 4000 Series TRANSMISSION	1
487	0020011		WATEROUS PUMP	1
488	0020009		POLY TANK	1
489	0028048		FOAM SYSTEM	1
490	0020006		SIDE CONTROL	1

Line	Option	Type	Option Description	Qty
491	0020007		AKRON VALVES	1
492	0020014		FRONT SUCTION	1
493	0020015		ABS SYSTEM	1
494	0658751		Manufacturing Attribute	1

Turning Performance Analysis

03/18/2016

Bid Number: 669
Department: Castle Rock Fire Department
Chassis: Velocity Chassis (Big Block), 2010
Body: Pumper, Med, Alum, 2nd Gen



Parameters:

Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	17.4 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	0.00 in.
Front Overhang:	78 in.
Wheelbase:	207.5 in.

Calculated Turning Radii:

Inside Turn:	16 ft. 2 in.
Curb to curb:	30 ft. 10 in.
Wall to wall:	34 ft. 9 in.

Comments:

Category	Option	Description
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0664500	Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply, Fire Service Speed Rtng
Bumpers	0569141	Bumper, 13" Extended, Steel Painted, Imp/Vel

Notes:

Actual Inside cramp angle may be less due to highly specialized options.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:	
Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.

Electrical Analysis

3/18/2016

Bid #: 669

Desc: Pumper, Med Alum, Velocity

Customer: Castle Rock Fire Department

Job #:

Sales Rep: Doucette, Duane

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002000	Chains, Automatic Tire, ONSPOT, Custom		0.00	1.50	0.00
0004485	Transfer Valve, Electric, Waterous		0.00	0.00	0.20
0006066	Control, Air Horn, DS & PS Lanyard		0.00	0.83	0.00
0012527	Lights, Engine Compt, (2), All Custom Chassis		0.00	0.00	3.20
0014308	Rack, Zico Quic-Lift		0.00	28.00	0.00
0015216	Reel, Booster, Aluminum - Over Pump, Pass Side		0.00	36.00	0.00
0015955	Lights, Deck, Unity (2) AG, Rear, Both Flood		0.00	0.00	7.82
0016080	Siren, Federal Q2B		0.00	100.00	0.00
0032085	Fan, Window Defrost, Two (2), Location Feature		0.00	2.50	2.50
0044860	Test Port, Electronic, Pump RPM, Waterous Pump		0.00	0.00	0.08
0079166	Batteries, (4) Exide Grp 31, 950 CCA each, Threaded Stud		0.00	3.00	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0505919	Lights, Side, Whelen TIR3, LED, RS*03ZCR Horizontal, Clear Lens,		0.00	0.00	1.50
0526992	Reel, Elect Cable, Akron, (3) Wire		0.00	36.00	0.00
0544516	Spotlight, Handheld Cab, Specialty Lighting 2150-1		0.00	7.81	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	60.00
0548009	Wiring, Spare, 20 A 12V DC 1st		0.00	0.00	20.00
0548015	Wiring, Spare, 30 A 12V DC 1st		0.00	0.00	30.00
0548618	Alarm, Back-up Warning, Whelen WBUA112		0.00	0.50	0.00
0549333	Indicators, Engine, Included with Pressure Controller		0.00	0.35	0.00
0550453	Lights, Side Scene, Zico ZQL-RV-LED, PVC, White 1st		0.00	0.00	1.00
0553353	Lights, Side, Whelen M6* LED, Split Color, Clear Lens		0.00	3.00	2.00
0553468	Lights, Rear, Whelen M6* LED, Split Color, Clear Lens		0.00	3.00	2.00
0555813	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v,		0.00	0.50	0.00
0559828	Light, Pump Compt, Whelen 20C0CDCD LED		0.00	3.60	0.00
0561471	Lights, Backup, Whelen M6BUW, LED, For Tail Lt Housing		0.00	3.20	0.00
0590300	Engine Brake, Jacobs Compression Brake, DD13		0.00	0.42	0.00
0593760	ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010		0.00	6.00	0.00
0602101	Generator, Harrison 3.6 kW Hydraulic, 30A 120VAC Hotshift PTO		0.00	0.00	19.30
0604028	Water Level Gauge, FRC, MaxVision WLA280-A00 Programable		0.00	0.00	1.00
0604354	Gauge, Foam Level, FRC, Tank Vision Pro, WLA 360-A00, Class "A"		0.00	0.00	1.23
0610968	Wiring, Spare, 2.5 A 12V DC, USB Termination Blue Sea 1016 1st		0.00	0.00	2.50
0618318	Light, Visor, Whelen, 12V PCP2* Pioneer LED Fld/Spt 1st		0.00	0.00	12.00
0624939	Foam Sys, Husky 3, Single Agent, Multi Select Feature		0.00	55.00	0.00
0641712	Primer, Waterous, VPO Motor, (2) VAP Valves, (2) Push Button		0.00	260.00	0.00
0648871	Light, Whelen, 12V PCP2P1 Pioneer LED, Spot/Fldlt, FRC Side Mt,		0.00	0.00	12.00
0650081	Lights, Dome, Whelen, 60C*EGCS Dual LED		0.00	0.00	1.50
0651262	Light, Whelen, 12V PCP2P1 Pioneer LED, Spot/Fldlt, FRC Side Mt,		0.00	0.00	12.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0654014	Control, Front Inlet, Electric, Akron 9323 Controller, w/Override		0.00	2.50	0.00
0667902	Controls, Electric Windows, All Cab Doors, Impel/Velocity FR		0.00	26.00	0.00
0667936	Heater/defroster, Dual Zone Control, Impel/Velocity FR		0.00	0.00	12.10
0673123	Light, Do Not Move Apparatus, Whelen 3SR00FRR LED		0.00	0.30	0.00
0678207	Spotlights, Unity 335CL LED Cab, Both Sides		0.00	0.00	4.68
0709645	Intercom, David Clark, 5-Pos, 3-Radio, (D,O,RPTT),2obC,P		0.00	0.00	0.50
0709892	Lightbars, Whelen, Freedom IV- 2-21.5", RRBR RBRR		0.00	0.00	14.56
0603346	Air Conditioning, Dual Zone Control, Hinge Acc Panel, Impel/Velocity	LM	0.00	0.00	96.50
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0080647	Rear, Rollup, 30.75" FF, 41.88" Deep, Flush Rear	NFPA	0.90	0.00	0.90

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply

Electrical Analysis

3/18/2016

Bid #: 669

Desc: Pumper, Med Alum, Velocity

Customer: Castle Rock Fire Department

Job #:

Sales Rep: Doucette, Duane

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0505417	Siren, Whelen 295HFSC9, Dual Tone, 200W	NFPA	0.80	7.20	0.00
0529743	Light, Traffic Directing, Whelen TANF85, 45.12" Long LED	NFPA	3.60	0.00	0.00
0540460	Light, Front Zone, Whelen M6*C LED, Clear Lens, 4lts Q Bezel	NFPA	1.80	5.40	1.80
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	NFPA	2.10	8.40	0.00
0556802	Lights, Side Zone Lower, Whelen M6* LED, Split Color, Clear Lens,	NFPA	5.40	8.10	0.00
0564654	Lights, Rear Zone Lower, Whelen M6* LED, Colored Lens, For Tail	NFPA	1.80	2.70	0.00
0564683	Lights, Tail, Whelen M6BTT* Red LED Stop/Tail & M6T* Amber LED	NFPA	0.83	2.49	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010,	NFPA	1.26	0.00	0.00
0586438	Gauges, Engine - Pump Panel, IAT Pressure Controller	NFPA	0.30	0.00	0.00
0587034	Air Dryer, Bendix, AD-IP w/Heat, 2010	NFPA	4.70	0.00	0.00
0591889	Lights, Clearance/Marker/ID, Rear, Whelen 0SR00MCR LED 7Lts	NFPA	0.25	0.25	0.50
0593143	Light Shield/Step 8" LED w/Weldon Step Light	NFPA	5.50	0.00	0.00
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00
0601016	PS 152" Lap, 3/4 Height Front & Rear, (1) Broom, Special Depth	NFPA	2.70	0.00	2.70
0605126	Pump Shift, Air w/Manual Override, Split Shaft, Interlocked, Waterous	NFPA	1.00	0.00	0.00
0607159	Gauge, Water Level, FRC, WLA 300-A00, TankVision Pro	NFPA	1.23	0.00	0.00
0610849	Engine, DDC DD13, 505 hp, 1750 lb-ft, W/OBD, EPA 2016, Velocity	NFPA	6.00	0.00	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0617440	Cabinet, EMS, Rear Facing, PS, 24.50 W x 40.50 H x 26.50 D, Web,	NFPA	1.50	0.00	1.50
0617921	Lights, Perimeter Pump House, Amdor AY-9500-020 LED 2lts	NFPA	0.58	0.00	0.00
0620054	Light, Directional/Marker, Intermediate, Weldon 9186-8580-29 LED	NFPA	0.10	0.90	0.00
0628818	Cabinet, EMS, Forward Facing, Center, 34 W x 52 H x 24 D, Imp/Vel	NFPA	1.50	0.00	1.50
0642533	Trans, Allison 5th Gen, 4500 EVS P, w/Prognostics, Imp/Vel/DCF/Enf	NFPA	2.00	2.00	0.00
0644038	Lights, Perimeter Cab, Amdor AY-9500-012 LED 4Dr	NFPA	0.53	0.00	0.00
0644971	Cabinet, EMS, Rear Facing, DS, 26.75 W x 40.50 H x 30.50 D, Web,	NFPA	1.50	0.00	1.50
0645995	Lights, Perimeter Body, Amdor AY-9500-020 LED 2lts, Rear Step	NFPA	0.40	0.00	0.00
0647647	Lights, Dome, FRP Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648425	Light, Directional, Whelen 600 LED Combination, Cab Corners,	NFPA	0.70	0.70	0.00
0648713	Headlights, Rectangular LED, JW Speaker, Imp/Vel	NFPA	7.20	7.20	0.00
0664466	Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp	NFPA	0.69	0.00	0.00
0668315	Cab, Velocity FR, 7010 Raised Roof	NFPA	6.80	10.20	0.00
0669077	Lights, Step, Whelen 0AC0EDCR White LED, 45 Deg Chrome Bzl,	NFPA	0.16	0.00	0.00
0672106	DS 152" Lap, Full Height Front & Rear, Double OTW, FDLER, Special	NFPA	4.50	0.00	4.50
0672975	Light, Rear Zone Upper, Whelen B6MM**1P, Super LED Beacon	NFPA	6.00	0.00	0.00
0673090	Lights, Cab and Crew Cab Access Steps, Whelen 3SC0CDCR LED	NFPA	1.20	0.00	0.00
0673878	Eng Compt, Trans, Special Width, 20" W x 42" H, Lap Dr	NFPA	1.80	0.00	1.80
0682499	Light Shield/Step 8", PS LED, Weldon Step Light	NFPA	5.50	0.00	0.00
0692045	Controller, Pressure, FRC, Pump Boss, PBA400	NFPA	1.80	0.00	0.00
0709894	Lightbar, Whelen, Freedom IV-D, 92",	NFPA	6.48	0.20	22.16
0566294	Alternator, 430 amp, Niehoff C680-1	S	0.00	0.00	0.00
		Load Totals:	**99.76**	**829.71**	**359.11**

Note: Minimum Continous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)
Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)
Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply

Electrical Analysis

3/18/2016

Bid #: 669

Desc: Pumper, Med Alum, Velocity

Customer: Castle Rock Fire Department

Job #:

Sales Rep: Doucette, Duane

Organization: Front Range Fire Apparatus, Ltd

Alternator Output at Idle: 300.00

Minimum Continuous Load	
Supply:	300.00
Demand:	99.76
Variance:	200.24

Alternator Output at Governed Speed: 401.00

Total Connected Load	
Supply:	401.00
Demand:	362.37
Variance:	38.63

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply

CONTENTS

Front Range Fire Apparatus is pleased to submit a proposal to Castle Rock Fire Department for a **Pierce® triple combination pumper** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

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

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

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

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

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

GENERAL DESIGN AND CONSTRUCTION

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

QUALITY AND WORKMANSHIP

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

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

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

To demonstrate the quality of our products and services, a list of at least ten (10) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

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

MANUAL AND SERVICE INFORMATION

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

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for

personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

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

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within seventy five (75) miles of the fire department.

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

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

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

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

COMMERCIAL GENERAL LIABILITY INSURANCE

Certification of insurance coverage will be enclosed.

SINGLE SOURCE MANUFACTURER

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

Your apparatus will be manufactured in Appleton, Wisconsin.

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

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

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

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

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

NFPA COMPLIANCY

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

VEHICLE INSPECTION PROGRAM CERTIFICATION

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

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

PUMP TEST

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

GENERATOR TEST

If the unit has a generator, Underwriters Laboratory (UL) will test, approved, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

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

BID BOND NOT REQUESTED

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

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

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are

included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

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

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

DRAWING, PRELIMINARY LAYOUT, PUMP OPERATOR'S PANEL

A detailed drawing, to scale, of the pump operator's panel will be provided for the purpose of illustrating the standard location(s) of controls and discharges on the pump operator's panel. The drawing will not be meant as an approval, or final construction drawing, rather it will be used as an illustration drawing of a standard panel layout. This drawing will include all of the gauges and controls located on the pump operator's panel.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be Size - 120 inches.

WHEELBASE

The wheelbase of the vehicle will be Wheelbase - 207.50".

GVW RATING

The gross vehicle weight rating will be GVW rating - 43,500 lbs..

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRONT NON DRIVE AXLE

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

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

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

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

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

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

Camber at load will be 0 degrees for optimum tire life.

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

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

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

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

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

FRONT SUSPENSION

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

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

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

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

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

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

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

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

FRONT TIRES
Front tires will be Goodyear 425/65R22.50 radials, 20 ply G296 tread, rated for 22,800 lb maximum axle load and 75 mph maximum speed.

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

REAR AXLE
The rear axle will be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb.

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

REAR SUSPENSION
The rear suspension will be Standens, semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 27,000 lb. The spring hangers will be castings.

The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye will be a berlin eye that will place the front spring pin in the horizontal plane within the main leaf.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

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

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)
A rear axle will be equipped with a driver controlled differential lock (DCDL).

The control will be located within easy reach of the driver. An indicator light will be provided next to the control switch.

REAR TIRES
Rear tires will be four (4) Goodyear® 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

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

TIRE BALANCE

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

TIRE PRESSURE MANAGEMENT

There will be a VECSAFE LED tire alert pressure management system provided that will monitor each tire's pressure. A chrome plated brass sensor will be provided on the valve stem of each tire for a total of six (6) tires.

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

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

FRONT HUB COVERS

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

REAR HUB COVERS

A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

AUTOMATIC TIRE CHAINS

One (1) pair of ONSPOT automatic tire chains will be provided at the rear. System will be electric over air operated with switch on cab instrument panel. System may be engaged at speeds up to 25 mph and operated at speeds up to 35 mph.

MUD FLAPS

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

WHEEL CHOCKS

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

WHEEL CHOCK BRACKETS

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will

be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted below the left side rear compartment.

ELECTRONIC STABILITY CONTROL

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

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

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

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

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

BRAKES

The service brake system will be full air type.

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

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

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

AIR COMPRESSOR, BRAKE SYSTEM

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

BRAKE SYSTEM

The brake system will include:

- Bendix® dual brake treadle valve with vinyl covered foot surface
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4,362 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)

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

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

- Bendix AD-IP air dryer with heater and coalescing filter

BRAKE LINES

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

AIR INLET

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

AIR OUTLET

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

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

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

AIR HOSE

There will be one (1) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

ADDITIONAL AIR TANK

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

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

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

ENGINE

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

Make:	Detroit™
Model:	DD13®
Power:	505 hp at 1625 rpm
Torque:	1750 lb-ft at 1075 rpm
Governed Speed:	2200 rpm

Emissions Certification:	EPA 2016 (GHG17)
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	781 cubic inches (12.8L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor

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

HIGH IDLE

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

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

ENGINE BRAKE

A Jacobs® engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have a high, medium and low setting.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

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

CLUTCH FAN

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

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust will terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The exhaust pipe will be brought straight out from under the body. The exhaust pipe will extend a maximum of 2.00" past the body side. The diameter of the pipe will be 7.00".

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of 1434 square inches. Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

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

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

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

COOLANT LINES

Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances, a comparable silicone hose from another manufacturer will be used.

Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

FUEL TANK

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

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

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

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

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

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

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

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

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

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

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

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

TRANSMISSION
An Allison 5th generation, Model EVS 4500P, electronic, torque converting, automatic transmission will be provided.

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

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

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

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

The transmission ratio will be: 1st - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, 6th - 0.67 to 1.00, R - 5.55 to 1.00.

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

DRIVELINE
Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

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

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

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

STEERING WHEEL

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

LOGO AND CUSTOMER DESIGNATION ON DASH

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

The first row of text will be: Castle

The second row of text will be: Rock

The third row of text will be: Fire Department

BUMPER

A one piece bumper manufactured from .25" formed steel with a .38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 13.00 " from the face of the cab. The bumper will be 102.00" wide with 45 degree corners and side plates. The bumper will be metal finished and painted job color.

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

GRAVEL PAN

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

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

CENTER HOSE TRAY

A hose tray, constructed of aluminum, will be placed in the center of the bumper extension.

The tray will have a capacity of 25' of 5.00" double jacket cotton-polyester hose.

Aluminum grating will be provided at the bottom of the tray. Drain holes are also provided.

CENTER HOSE TRAY RESTRAINT

There will be one (1) pair of hose tray restraint straps located over the center mounted tray.

The restraints will be a pair of 2.00" wide black nylon straps with Velcro® fasteners provided. The strap(s) will be used to secure the hose in the tray.

LIFT AND TOW MOUNTS

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

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

TOW EYES

Two (2) Chicago style tow eyes will be mounted through the top of the bumper extension. The inner and outer edges of the tow eyes will have a .25" radius.

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

The tow eyes will be painted same color as frame.

RHINO COATING - FRONT BUMPER

Protective black Rhino Linings® coating will be provided on the outside exterior of the top front bumper flange. It will not be sprayed on the underside of the flange.

The lining will be properly installed by an authorized Rhino Linings® dealer.

CAB

The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

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

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

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

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be

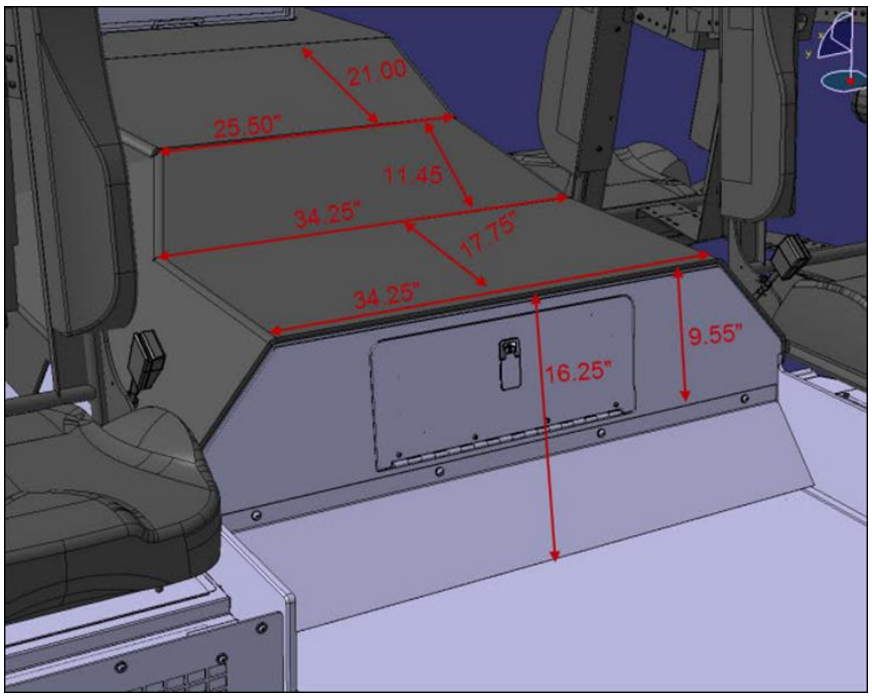
contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of 0.50" aluminum plate that is welded to both the 0.25" firewall and 0.38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The back of the engine tunnel will be no higher than 16.25" off the crew cab floor.

The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.



CAB REAR WALL EXTERIOR COVERING

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

CAB LIFT

A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25"

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

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

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

GRILLE
A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

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

FRONT CAB TRIM
There will be polished stainless steel rectangular garnish plates installed behind the two (2) headlight bezels for an enhanced appearance.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING
Chrome molding will be provided on both sides of cab.

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

FRONT CROSS VIEW MIRROR
A Grote 8.00" diameter convex mirror will be provided. The mirror will provide the driver with a view of the right front bumper corner and the area several feet in front of the truck.

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

CAB DOORS

The forward cab and crew cab doors will be the half-height style door. To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 64.71" high. The crew cab doors will measure a minimum of 37.87" wide x 73.75" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

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

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab and crew cab door.

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

CAB DOOR PANELS

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable without disconnecting door and window mechanisms.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1/2 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.

The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

ELECTRIC CAB DOOR LOCKS

The front driver and passenger doors will have a door lock master switch (custom designed rotary lock knob) built into the interior door latch that will control all front and rear side exit door locks. Each rear cab door will have its own lock control. Each door will have a keyed exterior lock mechanism built into the door handle assembly.

There will be one (1) concealed switch on the exterior of the cab, located under the front full width service access panel, that operates the cab door locks.

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

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs will not be acceptable due to safety concerns. A slip-resistant handrail will be provided adjacent to each cab door opening to assist during cab ingress and egress.

STEP LIGHTS

There will be four (4) Whelen, Model 3SC0CDCR, 3.00" round white 12 volt DC LED lights installed a Whelen, Model 3FLANGE chrome flange.

- One (1) light will be installed in the driver's cab step well.
- One (1) light will be installed in the passenger's cab step well.
- One (1) light will be installed in the passenger's side crew cab step well.
- One (1) light will be installed in the driver's side crew cab step well.

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

FENDER CROWNS

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

WINDOWS, REAR

The rear wall of the crew cab will have two (2) windows, each being 8.00" wide x 14.00" high.

WINDOW INTERIOR TRIM

For improved aesthetics, the cab rear wall windows will include a vacuum formed ABS interior trim panel.

WINDOW TINT

Crew cab door windows will be provided with increased tint to 44 percent to reduce light transmission. The following windows are included:

- Crew cab door, roll-up windows

- Top fixed window in crew cab doors

STORAGE COMPARTMENT

Provided on each side of the cab, below the cab floor and to the rear of the crew cab access doors, will be a storage compartment. The compartments will be approximately 10.71" wide x 19.25" high x 22.00" deep at the top and 18.75" at the bottom. The bottom front of the compartment will be blistered for side wall support. The clear door opening will be 9.50" wide x 16.50" high.

Each door will be a painted single pan construction with a quarter turn mini D-Handle latch. A rubber covered bumper will be used as a door stop.

Compartment Light
There will be no lights required in the compartments.

KNOX MEDVAULT 2
There will be a Knox MedVault® 2, Model 5520, installed location determined at pre-construction within the cab. The box will be surface mounted and WiFi enabled.

CAB INTERIOR
With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion

associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be black. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

CAB INTERIOR PAINT

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

CAB FLOOR

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

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow will be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters will include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters will be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.

AIR CONDITIONING

Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs to be painted to match the cab roof.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

There will be a hinge on the forward edge of the filter cover and two (2) quarter turn fasteners with a knob on the rear edge to allow easy access.

The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Four (4) will be directed towards the drivers location
- Four (4) will be directed towards the officers location
- Nine (9) will be directed towards crew cab area

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

The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of 4 per 1.00" thickness.

WINDOW DEFROST FANS

Two (2) window defrost fans will be mounted on the ceiling of the cab, located each side on the overhead console.

SUN VISORS

Two (2) smoked Lexan™ sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

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

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

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

ENGINE COMPARTMENT LIGHTS

Two (2) engine compartment lights will be installed under the engine hood, with an integral switch. The lights will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

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

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

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

STORAGE BOX

There will be four (4) storage box(es) designed to hold and dispense boxes of latex gloves provided. Each box will have four (4) sides. One (1) side will be hinged with a latch so the latex gloves box can be changed when empty.

Each box will be constructed of aluminum and located two in the cab and two in the crew cab.

Each storage box will be 10.00" wide x 5.00" deep x 3.50" high and painted to match the cab interior. A slot will be provided on the top of each box to dispense the gloves.

MAP BOX

A special map box with nine (9) bins, open from top, will be supplied and installed rear of engine tunnel. The map box will be 21.00" wide x 8" high (tapered down at sides and rear) and 22.00" front to back. The map box will be constructed of .125" aluminum and will be painted to match the cab interior. See engineering packet for customer supplied layout.

CAB SAFETY SYSTEM

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

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.

- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

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

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

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

SIDE ROLL PROTECTION

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

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

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

SEATING CAPACITY

The seating capacity in the cab will be four (4).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls

to adjust the rake (15 degrees), height (1.12" travel) and horizontal (7.75" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

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

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

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the officer. The seat will be a fixed type, with no suspension. For optimal comfort, the seat will be provided with 17.00" deep foam cushions. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

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

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located under the front passenger's seat. The size of the compartment will be approximately 16.00" wide x 7.50" high x 16.50" deep. A drop-down door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE EMS COMPARTMENT

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

The compartment will be 26.75" wide x 40.50" high x 30.50" deep. The interior door will be web netting. The netting is to be made with 1.00" wide nylon material with 2.00" openings. Quick-release buckles will be used to fasten all sides of the opening. The clear door opening of the compartment will be 18.00" wide x 35.25" high.

The compartment will also provide access from outside the cab with a double pan lap style door having a minimum clear door opening of 18.25" wide x 37.75" high. The door will include a locking D-ring latch and will be located on the side of the cab over the wheelwell.

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

Compartment Light

There will be two (2) white LED strip lights installed, one (1) each side of the compartment opening. The lights will be controlled by an automatic door switch and a switch on the exterior of the compartment.

REAR FACING PASSENGER SIDE EMS COMPARTMENT

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

The compartment will be 24.50" wide x 40.50" high x 26.50" deep. The interior door will be web netting. The netting is to be made with 1.00" wide nylon material with 2.00" openings. Quick-release buckles will be used to fasten all sides of the opening.

The compartment will also provide access from outside the cab with a double pan lap style door having a minimum clear door opening of 15.75" wide x 37.75" high. The door will include a locking D-ring latch and will be located on the side of the cab over the wheelwell.

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

Compartment Light
There will be two (2) white LED strip lights installed, one (1) each side of the compartment opening. The lights will be controlled by an automatic door switch and a switch on the exterior of the compartment.

FORWARD FACING DRIVER SIDE OUTBOARD SEAT
There will be one (1) forward facing, Pierce PS6® foldup seat provided at the driver side outboard position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER EMS COMPARTMENT
A forward facing EMS compartment will be provided in the crew cab at the center position.

The compartment will be 34.00" wide x 52.00" high x 24.00" deep with one (1) Amdor roll up door, non-locking with anodized finish. The compartment will be provided with no false floor. Wireway covers will be located inside the compartment, along the upper rear wall

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

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

FORWARD FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) forward facing, Pierce PS6® foldup seat provided at the passenger side outboard position in the crew cab. To provide improved ride comfort, and maximize accessibility to the crew cab, the seat will be a minimum of 15.00" from the front of the cushion to the face of the seat back and the seat back will be provided with 0 degree fixed recline angle. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

SHELVING

There will be three (3) shelves provided. Each shelf will be constructed of 0.090" aluminum with a 1.25" up-turned lip. Shelving will be infinitely adjustable by means of a threaded tightener sliding in a track.

The location will be one (1) shelf in the driver side rear facing EMS cabinet, one (1) shelf in the passenger side rear facing EMS cabinet and one (1) shelf in the center forward facing EMS cabinet.

SLIDE-OUT FLOOR TRAY

There shall be one (1) sliding tray(s) provided in the center forward facing EMS cabinet.

The capacity rating will be 250 pounds minimum in the extended position.

The construction will consist of .188" thick aluminum formed to provide a 1.00" high lip around the perimeter of tray.

Corners will be welded to form a rigid unit.

Slide mechanisms will have ball bearings for ease of operation and years of dependable service.

An automatic lock will be provided for both the in and out tray positions.

The lock trip mechanism will be located at the front of the tray and will be easily operated with a gloved hand.

Tray will be mounted to the floor of the EMS compartment.

SEAT UPHOLSTERY

All Pierce PS6 seat upholstery will be maroon woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, will not be acceptable.

There will be a quantity of three (3) SCBA brackets.

SEAT BELTS

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

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

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

SHOULDER HARNESS HEIGHT ADJUSTMENT

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

A total of four (4) seating positions will have the adjustable shoulder harness.

HELMET HOLDER

There will be four (4) On Scene Talon, Model 92510, helmet holder bracket(s) provided in the cab. Each bracket will provide quick access and secure storage of the helmet.

The bracket location(s) will be determined at time of final inspection.

CAB DOME LIGHTS

There will be four (4) dual LED dome lights with black bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

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

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

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

In order to ensure exceptional illumination, each white LED dome light will provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

ADDITIONAL DOME LIGHTING

There will be one (1) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights installed in the cab and/or crew cab located Officer & Driver.

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

The white LED's will be controlled by the same switching as the crew cab dome lights.

The color LED's will be controlled by the same switching as the crew cab dome lights.

The light(s) may be load managed when the parking brake is applied.

CAB SPOTLIGHTS

There will be two (2) Unity, Model 335CL, white 12 volt DC LED spotlights with chrome housing provided on each side of the cab.

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

HAND HELD LIGHT

There will be four (4) Streamlight, Fire Vulcan, Model #44451, hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted To be determined.

Each light housing will be orange in color and be provided with a C4, LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.

HAND HELD SPOTLIGHT

There will be a Specialty Lighting, Model 2150-1, hand held spotlight installed within reach of the officer seat. The light will be furnished with a 9 foot coil cord.

CAB INSTRUMENTATION

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

GAUGES

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

- Voltmeter gauge (Volts)

Low volts (11.8 VDC)

Amber indicator on gauge assembly with alarm

High volts (15 VDC)

Amber indicator on gauge assembly with alarm

Very low volts (11.3 VDC)

Amber indicator on gauge assembly with alarm

Very high volts (16 VDC)

Amber indicator on gauge assembly with alarm

- Tachometer (RPM)

- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

- Fuel level gauge (Empty - Full in fractions)

Low fuel (1/8 full)

Amber indicator on gauge assembly with alarm

Very low fuel (1/32) fuel

Amber indicator on gauge assembly with alarm

- Engine oil pressure gauge (PSI)

Low oil pressure to activate engine warning lights and alarms

Red indicator on gauge assembly with alarm

- Front air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Rear air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Transmission oil temperature gauge (Fahrenheit)

High transmission oil temperature activates warning lights and alarm

Amber indicator on gauge assembly with alarm

- Engine coolant temperature gauge (Fahrenheit)

High engine temperature activates an engine warning light and alarm

Red indicator on gauge assembly with alarm

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

Low fluid (1/8 full)

Amber indicator on gauge assembly with alarm

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

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front"

design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine

- Rack down

The following green telltale lamps will be provided:

- Left turn

- Right turn

- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

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

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

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

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

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

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

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

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

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

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

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

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

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

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)

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

- Diesel particulate filter regeneration switch (where applicable)

- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer

- Trip mileage

- PTO hours

- Fuel consumption

- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

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

"DO NOT MOVE APPARATUS" INDICATOR

A Whelen Model 3SR00FRR flashing red LED indicator light with a Whelen, Model 3FLANGEC chrome surface mount flange located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On".

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

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

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

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

SWITCH PANELS

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

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

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

SPARE CIRCUIT

There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate two in the front of cab under instrument panel and two in the crew cab tucked in seat riser
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

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

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground

- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate in electrical distribution box on the engine tunnel
- Termination will be with 3/8" studs and plastic covers
- Wires will be sized to 125% of the protection

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

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be protected to 2.5 amps at 12 volts DC.
- Power and ground will terminate center dash area.
- Termination will be a Blue Sea Systems part number 1016 dual USB charger socket.
- Wires will be sized to 125% of the protection.

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

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 30 amps at 12 volts DC
- Power and ground will terminate center forwward facing EMS cabinet on back wall near floor
- Termination will be with a 10-place bus bar with screws and removable cover
- Wires will be sized to 125% of the protection

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

INFORMATION CENTER

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

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

GENERAL SCREEN DESIGN

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

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

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

HOME/TRANSIT SCREEN

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if equipped)
- Foam Level (if equipped)
- Seat Belt Monitoring Screen

- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

ON SCENE SCREEN

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

VIRTUAL BUTTONS

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

PAGE SCREEN

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
  - Faults
    - Listed by order of occurrence
    - Allows to sort by system
  - Interlock
    - Throttle Interlocks
    - Pump Interlocks (if equipped)
    - Aerial Interlocks (if equipped)
    - PTO Interlocks (if equipped)
  - Load Manager
    - A list of items to be load managed will be provided. The list will provide a description of the load.

        - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
        - The screen will indicate if a load has been shed (disabled) or not shed.
        - "At a glance" color features are utilized on this screen.
    - Systems
        - Command Zone
            - Module type and ID number
            - Module Version
            - Input or output number
            - Circuit number connected to that input or output
            - Status of the input or output
            - Power and Constant Current module diagnostic information
        - Foam (if equipped)
        - Pressure Controller (if equipped)
        - Generator Frequency (if equipped)
    - Live Data
        - General Truck Data
- Maintenance
    - Engine oil and filter
    - Transmission oil and filter
    - Pump oil (if equipped)
    - Foam (if equipped)
    - Aerial (if equipped)
- Setup
    - Clock Setup
    - Date & Time
        - 12 or 24 hour format
        - Set time and date
    - Backlight
        - Daytime
        - Night time
        - Sensitivity
    - Unit Selection
    - Home Screen
    - Virtual Button Setup
    - On Scene Screen Setup
    - Configure Video Mode
        - Set Video Contrast

        - Set Video Color
        - Set Video Tint
- Do Not Move
    - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicate
        - Driver Side Cab Door
        - Passenger's Side Cab Door
        - Driver Side Crew Cab Door
        - Passenger's Side Crew Cab Door
        - Driver Side Body Doors
        - Passenger's Side Body Doors
        - Rear Body Door(s)
        - Ladder Rack (if applicable)
        - Deck Gun (if applicable)
        - Light Tower (if applicable)
        - Hatch Door (if applicable)
        - Stabilizers (if applicable)
        - Steps (if applicable)
- Notifications
    - View Active Alarms
        - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
        - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)

Button functions and button labels may change with each screen.

VEHICLE DATA RECORDER

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

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

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

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

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

- The home screen is active:
  - and there is any occupant seated but not buckled or any belt buckled with an occupant.
  - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

INTERCOM SYSTEM

There will be a five (5) position David Clark, Model U3800, intercom system with single radio interface capability at the driver officer, and pump panel positions provided. The driver and officer will each have a remote push-to-transmit button located forward facing outboard positions. Two (2) forward facing, inboard crew cab seating positions will have intercom only.

The following components will be supplied with this system:

- One (1) U3805 Radio Cord Junction Module
- Two (2) U3815 Radio Interface Modules (Driver, Officer)
- Two (2) Remote Push-To-Transmit kits
- One (1) U3800 Intercom Unit (2 Crew)
- One (1) C3820 Power Cable
- One (1) U3815A Radio Interface Module (Pump)
- All necessary station cables and connectors

RADIO / INTERCOM INTERFACE INCLUDED

All radio interfaced stations will have universal radio interfaces installed. The interface wiring will be routed within the cab to center overhead position .

UNDER THE HELMET HEADSET

There will be four (4) under the helmet headset(s) with one (1) slotted ear cup provided driver/engineer position.

Each David Clark, Model H3441, headset will feature:

- 5' Coiled cord
- Noise cancelling electric microphone
- Flexible microphone boom rotates 200 degrees for left or right dress
- Microphone on/off button
- Comfort Gel Earseals
- 23 dB noise reduction

RADIO ANTENNA MOUNT

There will be two (2) Maxrad, Model BMATM, antenna-mounting base(s) with 17.00' coax cable and weatherproof cap provided.

The mount(s) will be located on the cab roof To be determined.

The cable will be routed to the officer side seat box.

ELECTRICAL POWER CONTROL SYSTEM

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

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

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

SOLID-STATE CONTROL SYSTEM

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

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

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

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

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

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

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

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

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

CIRCUIT PROTECTION AND CONTROL DIAGRAM

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

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

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

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

TECH MODULE WITH WIFI

An in cab module will provide Wifi wireless interface and data logging capability. (No Exception) The Wifi interface will comply with IEEE 802.11 b/g/n capabilities while

communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a wifi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events (no exceptions).

The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

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

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

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

ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:

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

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

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

EMI/RFI PROTECTION

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

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without

exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

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

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

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

1. All holes made in the roof will be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

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

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

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

BATTERY SYSTEM

There will be four (4) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

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

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

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

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

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

BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

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

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

The battery charger indicator will be located behind the driver's door on the outside of the cab.

SHORELINE

There will be one (1) 15 amp 120 volt AC straight blade inlet(s) NEMA 5-15 with gray cover(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline will be connected to the battery charger and the six place outlet in the crew cab.

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

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

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side seat riser.

ALTERNATOR

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGER

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

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

The system will include the following features:

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

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

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

SEQUENCER

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

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

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

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

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

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

HEADLIGHTS

There will be four (4) JW Speaker, rectangular LED lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a Model 8800-12V - DOT/ECE LB LED low beam module.
- The inside light on each side will contain a Model 8800 -12V - DOT/ECE HB LED high beam module.

DIRECTIONAL LIGHTS

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

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

INTERMEDIATE LIGHT

There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light will double as a turn signal and marker light.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Whelen®, Model 0SR00MCR, LED lights with a chrome flange used as identification lights located at the rear of the apparatus per the following:

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

There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

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

There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

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

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

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

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights shall be provided with color lenses.

The lights will be mounted in a polished combination housing.

There will be two (2) Whelen Model M6BUW, LED backup lights provided in the tail light housing.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket located below the tailboard on a removable bolt-on bracket located driver side.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.

LIGHTING BEZEL

There will be two (2) Whelen, Model M6FCV4P, four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.

LICENSE PLATE BRACKET

There will be one (1) license plate bracket(s) mounted on the driver side rear bulkhead.

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

BACK-UP ALARM

A Whelen, Model WBUA112, solid state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The alarm will automatically adjust to ambient noise levels to avoid the nuisance of high decibel output when not required. The device will sound at a range of 87 to 112 decibels.

CAB PERIMETER SCENE LIGHTS

There will be four (4) Amdor Model AY-9500-012, 12.00" white LED strip lights provided.

- One (1) under the driver's side cab access step.
- One (1) under the passenger's side cab access step.
- One (1) under the passenger's side crew cab access step.
- One (1) under the driver's side crew cab access step.

The lights will be activated when the battery switch is on and the respective door is open and whenever control has been selected for the body perimeter lights.

PUMP HOUSE PERIMETER LIGHTS

There will be two (2) Amdor LumaBar H2O, Model AY-9500-020, 20.00" LED weatherproof strip lights with brackets provided under the pump panel running boards, one (1) each side.

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

BODY PERIMETER SCENE LIGHTS

There will be two (2) Amdor LumaBar H2O™, Model AY-9500-020, 20.00" 12 volt DC LED strip lights provided at the rear step area of the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated when a switch within reach of the driver is activated and the parking brake is applied.

STEP LIGHTS

There will be at least two (2) Whelen, Model 0AC0EDCR, white 12 volt DC LED step lights provided over the driver's side pump panel running board. The lights will be installed on the pump panel no more than 10.00" over the surface of and 15.00" apart. An additional light will be included depending on the length of the running board.

There will be at least two (2) Whelen, Model 0AC0EDCR, white 12 volt DC LED step lights provided over the passenger's side pump panel running board. The lights will be installed on the pump panel no more than 10.00" over the surface of and 15.00" apart. An additional light will be included depending on the length of the running board.

There will be at least two (2) Whelen, Model 0AC0EDCR, white 12 volt DC LED step lights provided over the rear tailboard. The lights will be installed no more than 10.00" over the surface of and 15.00" apart. Additional lights will be included depending on the length of the tail board.

These step lights will be actuated when the battery switch is on and the parking brake is applied.

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

SCENE LIGHTS

There will be two (2) Ziamatic, Model ZQL-RV-LED, LED scene light(s) with PVC housing, installed on the side of the apparatus, near rear wheels each side.

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

a switch at the driver's side switch panel

no additional switch location

no additional switch location

no additional switch location

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

12 VOLT LIGHTING

There will be one (1) Whelen Pioneer, Model PCP2P1, 12 volt DC LED combination spot/floodlight(s) with a switch on the light head provided on a Fire Research, Model LTP540-NWO-HT100, side mount, pull up pole with top wire.

The lights will be located back of cab driver side, with light head positioned to the side.

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

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

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

The lights will be connected to the "Do Not Move Truck" light in the cab.

12 VOLT LIGHTING

There will be one (1) Whelen Pioneer, Model PCP2P1, 12 volt DC LED combination spot/floodlight(s) with a switch on the light head provided on a Fire Research, Model LTP540-NWO-HT100, side mount, pull up pole with top wire.

The lights will be located back of cab on passenger side, with light head positioned to the side.

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

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

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

The lights will be connected to the "Do Not Move Truck" light in the cab.

12 VOLT LIGHTING

There will be one (1) Whelen® Pioneer™, Model PCP2*, 12 volt LED combination spot/flood light(s) provided on the front visor, centered.

The painted parts of this light assembly to be white.

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

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

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

DECK LIGHTS

Two (2)-6.00" Unity AG, deck lights with swivel mount will be provided at the rear of the hose bed, one (1) each side.

Both lights will be furnished with a 6,000 candle power halogen flood bulb.

SWITCH, RADIO MASTER W/40 AMP BREAKER

A master switch will be provided for the radio operating electrical system to include a 40 amp breaker. The wiring will terminate beneath the officers seat, in the radio compartment.

SPECIAL WATER TANK

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

The Special tank will be T-shaped to provide for deep side compartments and to serve as a large sump to limit the amount of undraftable water.

The tank will be designed to achieve a low hose bed. Tank design will be a stepped design with the forward section of the tank higher than the section of the tank that is below the hose bed.

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

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

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

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

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

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

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

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

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

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

Sump will include a drain plug and the tank outlet.

Tank will have a combination vent and 14.00" fill tower.

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

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

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

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

Mounting system to be approved by the tank manufacturer.

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

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

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

TANK DRAIN

A 1.50" tank drain will be installed with a 1.50" ball valve located underneath the left front compartment and properly labeled.

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

WATER TANK RESTRAINT

A heavy-duty water tank restraint will be provided.

HOSE BED

The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

The hose bed will be as low as practical.

Standard hose bed width will be 68.00" inside.

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

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

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

The hose bed floor will be 64.00"" from the ground when the truck is fully loaded.

Hose bed will accommodate 200' X 1.75", 1,000' X 2.5", 1000' X 5.0", 200' X 2.5", and 200' X 1.75", in addition 150' of 1.75" will lay flat on top of the 600' of 2.5".

HOSE BED DIVIDER

Four (4) adjustable hosebed dividers will be furnished for separating hose.

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

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

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

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

REMOVABLE HOSE TRAY(S) IN HOSE BED

There will be three (3) removable hose tray(s) provided inside the hose bed.

The tray will be sized (1) 200' of 1.75" - (4) 200' of 2.50" - (5) 200' of 1.75"

Tray will be fabricated of dual action finish aluminum with two (2) hand hold cutouts on each end. The tray will slide on stainless steel angles. Bottom of angles will be lined with Dura-surf anti friction poly slides for ease of removal. A stop will be provided at the front of the tray to prevent the tray from moving forward and a pin will be supplied at the rear.

Tray will be located driver's and passenger's.

All interior vertical surfaces of the hose bed including the front will be lined with stainless steel. These liners will serve as scuffplates, protecting the painted surfaces.

HOSE BED COVER

A two (2) section hose bed cover, constructed of .125" bright aluminum treadplate will be furnished. The cover will be hinged with full length stainless steel piano hinge. The sides will be slanted down.

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

The cover is designed with the left cover opening first.

If access to the water tank fill tower is blocked by the hose bed cover, then a hinged door will be provided in it so that the tank may be filled without raising cover doors.

Chrome grab handles and four (4) gas filled cylinders will be provided to assist in opening and closing the cover. A handrail is to be provided at the rear, in the center of the support, to assist in opening the cover.

HOSEBED RESTRAINT REAR

There will be a red vinyl flap installed at the rear of the hosebed. The flap will be attached to the top hosebed frame with quarter turn fasteners. The flap will have straps that loop through footman loops at the bottom of the hosebed and fasten with spring clip and hook fasteners and chain.

RUNNING BOARDS

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

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

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

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

TAILBOARD

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

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

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

REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL

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

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

TOW BAR

A tow bar will be installed under the tailboard at center of truck.

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

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

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

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

RUNNING BOARD HOSE RESTRAINT

A pair of 2.00" wide black nylon straps with Velcro fasteners will be provided for each hose tray to secure the hose during travel. There will be One (1) hose tray located in the driver side running board.

HOSE TRAY

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

Capacity of the tray will be 50' of 5.00" hose.

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

COMPARTMENTATION

Body and compartments will be fabricated of .125", 5052-H32 aluminum.

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

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

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

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

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

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

Side compartment covers will be separate from the compartment tops.

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

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

UNDERBODY SUPPORT SYSTEM

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

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

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

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

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

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

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

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

AGGRESSIVE WALKING SURFACE

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

LOUVERS

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

TESTING OF BODY DESIGN

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

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

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

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

ENGINEER COMPARTMENT

A transverse engineer compartment will be provided ahead of the water pump.

The compartment will be 20.00" wide x 42.00" high x 86.00" deep. The door opening will be 18.50" wide x 40.25" high. The clear height of the transverse section over the chassis frame rails will be 25.00" high.

The compartment will be furnished with vertically hinged, lap style, compartment doors that have a D handle latch and positive door hold open device.

COMPARTMENTATION, DRIVER'S SIDE

A full height, vertically hinged, single door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 67.63" high x 25.88" deep in the lower 26.00" of the compartment and 16.00" deep in the remaining upper portion. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 30.00" wide x 63.00" high.

A positive door holder will be furnished with this compartment.

A vertically hinged, double door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 16.00" deep. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 59.50" wide x 28.25" high.

Positive door holders will be furnished with this compartment.

A full height, vertically hinged, double door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.50" wide x 67.63" high x 16.00" deep. A section of this compartment will be 25.88" deep x 47.50" width x 26.00" height directly behind the rear wheels. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 46.00" wide x 63.00" high.

Positive door holders will be furnished with this compartment.

COMPARTMENTATION, PASSENGER'S SIDE

A vertically hinged, single door compartment in the lower area ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 47.13" high x 25.88" deep in the lower 26.00" of the compartment and 16.00" deep in the remaining upper portion. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 30.00" wide x 42.50" high.

A positive door holder will be furnished with this compartment.

A three-quarter broom compartment with one horizontally hinged, drop-down door in the area above the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 12.38" high x 12.00" deep. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 59.50" wide x 7.75" high. The drop-down door will be furnished with two chain-style door holders with a plastic covering around the chain. Closing of the door will not require releasing, unlocking, or unlatching any mechanism.

A vertically hinged, double door compartment in the lower area behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.50" wide x 47.13" high x 25.88" deep in the lower 26.00" of the compartment and 16.00" deep in the remaining upper portion. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 46.00" wide x 42.50" high.

A positive door holder will be furnished with this compartment.

DOORS, SIDE COMPARTMENT

All hinged compartment doors will be lap style with double panel construction and will be a minimum of 1.50" thick. To provide additional door strength a "C" section reinforcement will be installed between the outer and interior panels.

Doors will be provided with a closed cell rubber gasket around the surface that laps onto the body. A second heavy-duty automotive rubber molding with a hollow core will be installed on the door framing that seals onto the interior panel, to ensure a weather resisting compartment.

All compartment doors will have polished stainless steel continuous hinge with a pin diameter of .25" that is bolted or screwed on with stainless steel fasteners.

All door locking mechanisms will be fully enclosed within the door panels to prevent fouling of the lock in the event equipment inside shifts into the lock area.

Doors will be latched with recessed, polished stainless steel "D" ring handles and FMVSS approved door locking mechanisms.

To prevent corrosion caused by dissimilar metals, compartment door handles will not be attached to outer door panel with screws. A rubber gasket will be provided between the "D" ring handle and the door.

REAR COMPARTMENTATION

A roll-up door compartment flush with the rear body will be provided.

Interior dimensions of this compartment will be 40.00" wide x 33.63" high x 41.88" deep in the lower 26.00" of height and 31.75" deep in the remaining upper portion. Depth of the compartment will be calculated with the compartment door closed.

For a chassis with a rear mounted fuel tank, a louvered removable access panel will be furnished on the back wall of the compartment.

Rear compartment will be open into the rear side compartments.

Clear door opening of this compartment will be 33.25" wide x 26.00" high.

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

ROLLUP DOOR, REAR COMPARTMENT

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

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

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in

extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

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

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

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

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

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

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

DOOR GUARD

There will be one (1) compartment door that will include a guard/drip pan designed to protect the rollup door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed rear compartment.

KEYED LOCK(S)

There will be six (6) compartment doors that require a keyed lock. The compartments to have a keyed lock shall be driver side and passenger side body compartments only.

REVERSE HINGED DOOR

The two (2) compartment doors, located driver and passenger doors forward of the rear wheels, will have the hinge at the rear of the door.

COMPARTMENT LIGHTING

There will be nine (9) compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment.The dual light strips will be in all body compartment(s).

Any remaining compartments without light strips will have a 6.00" diameter Truck-Lite, Model: 79384 light. Each light will have a number 1076 one filament, two wire bulb.

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

CARGO AREA COVER

An .188" aluminum treadplate cover will be provided over the cargo area above the pump. The cover will be located per sales drawing over the cargo area. If the cargo area to be covered is greater than 14" in width or length, reinforcement will be provided. The cover will be hinged along the outboard edge with a D-handle latch.

MOUNTING TRACKS

There will be four (4) sets of tracks for mounting shelf(s) in D3, D1, P1 and P3. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be eight (8) shelves with a capacity of 500 lb provided. The shelf construction will consist of .188" aluminum with 2.00" sides. Each shelf will be painted to match the compartment interior. Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

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

The location will be one in each compartment; D1(2), D3(2), P2(1) and R1(1) .

SLIDE-OUT FLOOR MOUNTED TRAY

There will be one (1) floor mounted slide-out tray(s) with 2.00" sides provided R1. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior.

There will be two undermount-roller bearing type slides rated at 250lb each provided. The pair of slides will have a safety factor rating of 2.

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

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

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

MODIFICATION, TAIL LIGHTS/WARNING LIGHT MOUNTING

Modifications will be provided for the tail lights and rear zone lower warning lights at the rear of the unit. The lights will be mounted in an enclosure on both sides of the tailboard, exterior to the beavertail. The enclosure will consist of a vertical aluminum painted wall from the rear beavertail to the exterior outboard edge of the tailboard to section off the exterior corner of the tailboard.

BEAVERTAIL

Beavertails will be provided.

TOOL BOX

A tool box will be furnished.

The outside size will be 22.00" long x 11.00" wide x 10.00" deep.

The tool box will be black in color.

Construction will be of .50" polypropylene plastic with joints and seams nitrogen welded. A cut out carrying handle will be provided on each end.

There will be two (2) provided. It will be located P1 body .

TOOL BOX

A tool box will be furnished.

The outside size will be 22.00" long x 12.00" wide x 6.00" deep.

The tool box will be black in color.

Construction will be of .50" polypropylene plastic with joints and seams nitrogen welded. A cut out carrying handle will be provided on each end.

There will be one (1) provided. It will be located D3 floor.

BACKBOARD STORAGE

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

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

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

The size of the backboard(s) to be stored will be 12" wide X 20" high X 78 " long with a divider 4" from the forward most wall .

PARTITION, TRANSVERSE REAR COMPARTMENT

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

HOSE STORAGE TRAY

A hose storage tray will be provided above the over passenger side body compartment side compartments. The tray will be fabricated out of bright aluminum treadplate with tig welded ends and an open top. Four (4) straps with Velcro® fasteners will be provided to secure the hose. The tray will have a capacity for Qty. - 1.

RUB RAIL

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

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

BODY FENDER CROWNS

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

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

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

HARD SUCTION HOSE

Two (2) lengths of 5.00" clear corrugated PVC hard suction hose, 10' in length, will be provided. The hose will be equipped with 6.00" long handle female coupling on one (1) end and 6.00" rocker lug male coupling on the other end. Couplings will be hard coated aluminum.

HOSE TROUGHS

Hard suction hose will be carried above the left compartment in V-shaped troughs and held in place by chrome plated, quarter turn, spring loaded clamps.

Troughs will be constructed of steel and painted job color.

The size and length of the hard suction hose that will be carried is 4.50" x 10'.

HANDRAILS

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

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

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

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

HANDRAILS

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

- One (1) horizontal handrail will be provided above the hose bed at the rear of the apparatus. [Reinforcement, Hose Bed Divider]
- One (1) full width horizontal handrail will be provided below the hose bed at the rear of the apparatus.

AIR BOTTLE STORAGE (DOUBLE)

A total of two (2) air bottle compartments will be provided. The air bottle compartment(s) will be located forward of the rear wheels, each side. Each air bottle compartment will be of adequate size to accommodate two (2) air bottles. Flooring will be rubber lined and be furnished with a drain hole. A brushed stainless steel, full width door with a chrome-plated latch will be provided to contain the air bottles. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

AIR BOTTLE STORAGE INSERT

A total of two (2) inserts will be provided for the air bottle storage compartments.

The air bottle compartment will be located forward of the rear wheels, each side.

The inserts will be formed in a "W" shape to help contain the bottles.

EXTINGUISHER STORAGE

A total of one (1) extinguisher compartments will be provided. rearward of the rear wheels, on passenger side. The extinguisher compartment will be in the form of a square tube (8.25" minimum) and of adequate depth to accommodate different size extinguishers. Flooring will be rubber lined and have a drain hole. A stainless steel door with a chrome plated latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners (screws) and the body sheet metal.

EXTENSION LADDER

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

ROOF LADDER

There will be one (1) 16' aluminum, Duo-Safety, Series 875-DR roof ladder(s) provided. The ladder(s) will have hooks on both ends.

LADDER RACK

Ground ladders will be mounted above right side of body compartments in a Zico Quic-Lift electric ladder lowering system. The ladder rack mounts will be powered by two (2), 12-volt electric actuators.

The electric controls will be located in such a manner to allow the operator full view of the area in which the ladders will be lowered.

The electric actuator control will have a master switch and be interlocked to prevent operation should a compartment door, in the travel area of the ladder bracket, be in the open position.

LADDER RACK INTERLOCK AND NOT STOWED INDICATOR LIGHT

An interlock will be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated.

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

LIGHTS, FLASHING, LADDER RACK

Flashing amber lights facing the front and rear will be provided on the ladder rack and activated whenever the rack is in the down position.

An aluminum treadplate box, for a model 17 Lil' Giant ladder, will be mounted To be determined. A velcro strap with footman loops will secure the ladder.

FOLDING LADDER

One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder will be installed on top of the right side compartment.

ADDITIONAL FOLDING LADDER

One (1) Revolution XE Model 12022 Little Giant folding ladder will be provided. The stored dimensions will be 67.00" high x 26.50" wide x 9.25" deep. The weight will be 38lb.

The ladder will be located under the hose bed cover.

LADDER BOOT
The ladders will be furnished with a yellow vinyl ladder boot.

8' PIKE POLE
One (1) pike pole, 8' long trash hook(s), Fire Hooks Unlimited, Model TRH-8 with D-handle will be provided and located driver side catwalk.

8' PIKE POLE
There will be one (1) Fire Hooks Unlimited, New York Hook , 8' long roof hook with steel shaft and chisel (pry) end provided.

6 FT PIKE POLE
There will be one (1) Fire Hooks Unlimited NY roof hook RH-6, 6 foot pike pole(s) with steel handles and pry end provided on the officer's side, rear exterior wall of the cabin..

PIKE POLE STORAGE
Aluminum tubing will be used for the storage of two (2) pike poles and will be located on the top of the driver side compartments. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

STEPS
A folding step will be provided on the front of each fender compartment. The step will be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours. The step can be used as a hand hold with two openings wide enough for a gloved hand.

REAR FOLDING STEPS
Bright finished, non-skid folding steps with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours will be provided at the rear. Each step will incorporate an LED light to illuminate the stepping surface. The steps can be used as a hand hold with two openings wide enough for a gloved hand.

Four (4) additional folding steps will be located on the left bulkheads two (2) each side. The step(s) will be bright finished, non-skid luminescent folding type. The luminescent coating is rechargeable from any light source and can hold a charge for up to 24 hours. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

PUMP
Pump will be a Waterous CMU 1750 gpm two (2) stage midship mounted centrifugal type.

Pump will be the class "A" type.

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

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

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

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

Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

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

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

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

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

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

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

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

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

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

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

PUMP TRANSMISSION

The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

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

PUMPING MODE

An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

AIR PUMP SHIFT

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

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

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

The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

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

TRANSMISSION LOCK-UP

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

AUXILIARY COOLING SYSTEM

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

TRANSFER VALVE

Transfer valve design will be of the latest ball type, of all bronze construction and incorporate a hydraulically balanced seal assembly, minimizing leakage around the ball and assuring maximum pump efficiency.

Transfer valve will operate smoothly and without sticking, even when exposed to sandy or dirty water.

Transfer valve will be operated electrically with a control switch mounted on the pump operator's control panel, with two (2) indicator lights which will indicate "pressure" or "volume".

Transfer valve will have the ability to change from series (pressure) operation to parallel (volume) operation without reducing the operating speed of the engine regardless of the operating pressure of the pump, thus maintaining an effective fire stream at the nozzle at all times.

A manual override will be provided in the event of electrical malfunction. The manual override system operates with the use of a removable hand crank located at the left (driver's) side pump panel.

INTAKE RELIEF VALVE

A Waterous relief valve, an integral part of the fire pump, will be installed on the suction side of the pump, preset at 125 psig.

Outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and an "intake pressure relief outlet - do not cap" warning tag.

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

A control mechanism to adjust the pressure will be located behind an access door at the right (passenger) side pump panel.

PRESSURE CONTROLLER

A Fire Research Pump Boss Model PBA400 pressure governor will be provided.

A pressure transducer will be installed in the water discharge manifold on the pump.

The display panel will be located at the pump operator's panel.

PRIMER SYSTEM

A Waterous electric pump priming system conforming to standards outlined in the current edition of NFPA 1901 will be furnished with the apparatus.

One (1) VPO electric motor driven rotary vane primer will be provided.

Two (2) VAP vacuum activated priming valves will be provided, one plumbed to main pump and one plumbed to the front suction.

Two (2) momentary push-button controls will be located at the pump operator's panel.

The push button control system control will operate an electric priming motor and the priming valve will automatically open during priming and close when the primer is deactivated.

A priming oil tank shall be provided to automatically lubricate and seal the sliding rotor vanes, when the pump operates. The priming oil tank shall be accessible through an inspection door on the right (passengers) side of the apparatus.

DRAINS- SPECIAL INSTRUCTIONS

All valves drains/bleeders will be tapped into the lowest point of each plumbing discharge and inlet. (This includes the ports on each valve as well).

PUMP MANUALS

There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) CDs. Each manual will cover pump operation, maintenance, and parts.

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines will be plumbed with either stainless steel pipe, hydraulic type hose or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

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

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

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

All water carrying gauge lines will be hydraulic type hose.

All piping, hose and fittings will have a minimum of a 700 PSI hydrodynamic pressure rating.

MAIN PUMP INLETS

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

MAIN PUMP INLET CAP

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

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

INLET BUTTERFLY VALVE

One (1) Waterous Monarch inline butterfly valve will be provided on the driver's side main pump inlet.

The 6.00" inlet valve will be partially recessed behind the pump panel with a "key hole" shaped stainless steel trim ring around the opening.

A built-in, adjustable pressure relief valve and a 3/4" bleeder valve will be provided on the inlet side of the valve.

A chrome plated handwheel control will be provided on the side pump panel adjacent to the inlet valve.

A valve position indicator will be provided, next to the valve control.

INLET BUTTERFLY VALVE

One (1) Waterous Monarch inline butterfly valve will be provided on the passenger's side main pump inlet.

The 6.00" inlet valve will be partially recessed behind the pump panel with a "key hole" shaped stainless steel trim ring around the opening.

A built-in, adjustable pressure relief valve and a 3/4" bleeder valve will be provided on the inlet side of the valve. The bleeder valve controls will be located at the threaded connection and at the pump operator's panel.

A chrome plated handwheel control will be provided on the side pump panel adjacent to the inlet valve.

A valve position indicator will be provided, next to the valve control.

PUMP SUCTION TUBES

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

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

VALVES

Waterous valves will be used for the side 2.50" discharges and all remaining ball valves, 3.00" or less, will be Akron Brass.

The Waterous valves will have a solid bronze ball that is chromium plated for a hard, durable surface. The spring loaded floating seal assembly will require no adjustment, yet provides a tight seal against both pressure and vacuum pressures.

The Akron valves will be the 8000 series heavy-duty style with a nickel-chrome plated brass ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

LEFT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.

INLET CONTROL

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

FRONT INLET

A 6.00" inlet front inlet with die cast zinc screens will be provided using 5.00" welded black iron pipe and a 5.00" butterfly valve. Only radiused elbows will be used in the piping, no mitered joints.

Drains are furnished in all the low points of piping and have .75" valves with swing handle.

A bleeder valve will be located at the threaded connection.

The front suction will be located on the passenger side of the bumper extension.

FRONT INLET CONTROL

The front inlet will be gated with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve or an indicator will be provided to show when the valve is closed.

There will be an Akron 9323 electric valve controller provided. The controller unit will be of true position feedback design, requiring no clutches in the motor or current limiting. The controller will be completely sealed with two (2) button open and close valve position capability and a full color LCD display with backlight.

A manual override will be provided on the valve. A stainless steel door located on the passenger side pump panel will be provided for access to the manual override.

A momentary toggle switch will be provided behind the stainless steel access door near the manual override. The switch will cut off power to the valve to allow for manual valve actuation.

INTAKE RELIEF VALVE

An intake relief valve, preset at 125 psig, will be installed on the inlet side of the valve.

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

Outlet will terminate below the frame rails.

The front suction will have a chromed 6.00" swivel with National Standard hose threads and a long handle chromed plated cap.

The swivel will have a rough smooth chrome finish.

6.00" STORZ ADAPTER

There will be a 6.00" FNST x 5.00" Storz rigid adapter with a Storz blind cap, provided on the front inlet plumbing.

INTERLOCK

An interlock system will be provided that will not allow the cab to be lifted unless the front suction is in the correct location as to not damage the cab.

INLET BLEEDER VALVE

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

TANK TO PUMP

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

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

TANK REFILL

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

LEFT SIDE DISCHARGE OUTLETS

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

RIGHT SIDE DISCHARGE OUTLETS

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

LARGE DIAMETER DISCHARGE OUTLET

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

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

REAR DISCHARGE OUTLET

There will be two (2) discharge outlets piped to the rear of the hose bed, one (1) each side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel.

DISCHARGE OUTLET (REAR)

There will be two (2) discharge outlets piped to the rear of the hose bed, one each side. Proper clearance will be provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. The discharge outlet(s) will terminate with a 2.50" male National Standard hose thread male adapter.

DISCHARGE CAPS

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

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

OUTLET BLEEDERS

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

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

LEFT SIDE OUTLET ELBOWS

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

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

RIGHT SIDE OUTLET ELBOWS

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

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

REAR OUTLET ELBOWS

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

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

ADDITIONAL REAR OUTLET ELBOWS

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

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

LARGE DIAMETER OUTLET ELBOWS

The 4.00" outlet(s) will be furnished with one (1) 4.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

ADAPTER

There will be two (2) adapters with 1.50" FNST X NPSH. These adapters will be installed on rear hosebed outlets.

DISCHARGE OUTLET CONTROLS

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

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

DELUGE RISER

A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel.

The outlet flange for the monitor will be high enough to allow the monitor to be rotated without interference with any other items in the area.

MONITOR

A Task Force Crossfire XFC-52 monitor package will be furnished and properly installed on the deluge riser. The monitor will include a M-R nozzle, 10" stream straightener and quad stacked tips. The portable base unit with folding legs and a safety valve will have (2) 2.50" female NST inlets. The monitor will be painted as provided by monitor manufacturer.

The deluge riser will have a Task Force Tips, Model XFF-APL truck mount adapter for mounting the CrossFire monitor.

CROSSLAY HOSE BED, 2.50"

One (1) crosslay with a 2.50" outlet will be provided. The bed will be capable of carrying 300' of 1.75" D.J hose and nozzle and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

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

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

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

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

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY/DEADLAY HOSE RESTRAINT

Elastic netting will be provided across the top and ends of one (1) crosslay/deadlay opening(s) to secure the hose during travel. The netting will be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

CROSSLAY ROLLER

A stainless steel roller will be mounted horizontally and vertically at each crosslay opening to aid in hose removal. The vertical rollers will be installed on the dividers and to the front and rear of the crosslays.

TRAY, SPEEDLAY

There will be two (2) additional tray(s) provided for the speedlays. The trays will be identical in design and will be shipped with the loose equipment.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel will be installed over the pump in a recessed open compartment on the right side of the apparatus. The reel will be fabricated of aluminum and have highly polished end discs.

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

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

Reel motor will be protected from overload with a circuit breaker rated to match the motor.

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

Booster hose, .75" diameter and 100 feet, with chrome plated Barway, or equal couplings will be provided.

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

Capacity of the hose reel will be 100 feet of 1.00" booster hose.

HOSE REEL NOZZLE

There will be One (1) Task Force, model DS 1040 nozzle(s) with bale for booster reel provided.

HOSE REEL BLOWOUT

one (1) hose reel blowout(s) will be furnished to blow out any remaining water from the reel(s). The blowout will be piped from the wet tank of the brake system to the reel, and will be controlled at the pump operator's panel.

NOZZLE CUP AND BRACKET

A Zico nozzle cup and chrome plated mounting bracket will be provided for storage of the booster reel nozzle.

There will be one (1) provided. The nozzle cup(s) will have a 3-1/2" inside diameter and will be located to be determined.

HUSKY 3 FOAM PROPORTIONER

A Pierce Husky® 3 foam proportioning system will be provided. The Husky 3 is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation will be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system will automatically proportion foam solution at rates from .1 percent to 3.0 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation.

SYSTEM CAPACITY

The system will have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 150 psi.

100 gpm @ 3 percent

300 gpm @ 1 percent

600 gpm @ 0.5 percent

Class A foam setting in .1 percent increments from .1 percent to 1 percent. Typical settings of 1 percent, .5 percent and .3 percent (maximum capacity will be limited to the plumbing and water pump capacity).

CONTROL SYSTEM

The system will be equipped with a digital electronic control display located on the pump operators panel. Push button controls will be integrated into the panel to turn the system on/off, control the foam percentage, and to set the operation modes.

The percent of injection will have a preset. This preset can be changed at the fire department as desired. The percent of injection will be able to be easily changed at the scene to adjust to changing demands.

Three (3) .50 tall LEDs will display the foam percentage in numeric characters. Three (3) indicator LEDs will also be included, one (1) green, one (1) red, and one (1) yellow. The LEDs will indicate various system operation or error states.

The indications will be:

Solid Green - System On

Solid Red - Valve Position Error

Solid Yellow - Priming System

Flashing Green - Injecting Foam

Flashing Red - Low Tank Level

Flashing Yellow - Refilling Tank

The control display will house a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump.

HYDRAULIC DRIVE SYSTEM

The foam concentrate pump will be powered by an electric over hydraulic drive system. The hydraulic system and motor will be integrated into one (1) unit.

FOAM CONCENTRATE PUMP

The foam concentrate pump will be of positive displacement, self-priming; linear actuated design, driven by the hydraulic system. The pump will be constructed of brass body; chrome plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum will be present in its construction.

A relief system will be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump

The foam concentrate pump will have minimum capacity for 3 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

EXTERNAL FOAM CONCENTRATE CONNECTION

An external foam pick-up will be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty, or the use of foam different than the foam in the foam tank.

PANEL MOUNTED EXTERNAL PICK-UP CONNECTION / VALVE

A bronze three (3)-way valve will be provided. The unit will be mounted to the pump panel. The valve unit will function as the foam system tank to pump valve and external suction valve. The external foam pick-up will be one (1) .75" male connection GHT (garden hose thread) with a cap.

PICK-UP HOSE

A .75" flexible hose with an end for insertion into foam containers will be provided. The hose will be supplied with a .75" female swivel GHT (garden hose thread) swivel connector. The hose will be shipped loose.

DISCHARGES

The foam system will be plumbed to the Rear outlet left side inboard, hose reel in right side of dunnage area, left rear outlet, right rear outlet, front crosslay and rear crosslay.

SYSTEM ELECTRICAL LOAD

The maximum current draw of the electric motor and system will be no more than 55 amperes at 12 VDC.

SINGLE FOAM TANK REFILL

The foam system's proportioning pump will be used to fill the foam tank. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch will be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation will be controlled by a mode in the foam system controller. While the proportioner pump is filling the tank, the controller will display a flashing yellow LED to indicate that the tank is filling. When the tank is full, as determined by the float switch in the tank dome, the pump will stop and the controller will shut the yellow LED off. If it attempted to use tank fill and the refill valve and suction valve are in the wrong position(s), then a red LED will illuminate to indicate the improper valve position(s). When the valves are positioned properly, then filling will commence.

FOAM LABEL

The foam tank for Class A foam will have a label that reads "40 Gallon Capacity".

FOAM SYSTEM TRAINING

The fire department will order three (3) vehicles with this foam system. A demonstration will be provided at the apparatus manufacturers facility on the operation of the foam system.

This demonstration will include:

- A review of the foam system manual emphasizing key areas

- A walk around review of the system components on the finished truck

- A hands-on foam system start-up and foam discharge session

- Instructions on the use of the manual overrides

- The proper way to shut down and flush the foam system.

FOAM TANK

The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 40 gallons of foam with the intended use of Class A foam. The brand of foam stored in this tank will be To be determined. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

A system of 1.00" foam tank drains will be provided, integrated into the foam systems strainer and tank to foam pump valve management system.The tank to pump hoses running from the tank(s) to the panel mounted strainer will 1.00" diameter.The foam system controller will have a mode that allows for a given foam valve to be opened at will. Flow of foam from the tank valve to the strainer will be usable as a tank drain mode.

An adaptor will be supplied, that allows the 1.00" foam intake screen to assembly to be used as a drain outlet. The standard supplied 1.00" foam pick up hose will be attached to the screen assembly by way of the adapter. The drain mode will allow the operator to open and close the tank valve as required from the control head, to drain foam and re-fill foam containers through the connected hose, without foam spillage beneath the vehicle.

PUMP COMPARTMENT

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

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

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

PUMP MOUNTING

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

LEFT SIDE PUMP CONTROL PANELS

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

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

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

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

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

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

IDENTIFICATION TAGS

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

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

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

All remaining identification tags will be mounted on the pump panel in chrome plated bezels.

The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

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

PUMP PANEL CONFIGURATION

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

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of stainless steel with a brushed finish. A polished aluminum trim molding will be provided on both sides of the pump panel.

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

PUMP COMPARTMENT LIGHTS

There shall be one (1) Whelen Model 20C0CDCD, 4.00" diameter LED light(s) provided inside the pump enclosure.

The light(s) shall be surface mounted using a chrome plated flange.

The light(s) shall be activated when the battery switch is on and a switch on the pump panel is on.

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion. These gauges will be in addition to what is provided with the pressure controller.

- Engine Oil Pressure Gauge: With visual and audible warning

- Engine Water Temperature Gauge: With visual and audible warning

- Tachometer: Electric

- Master Pump Drain Control

- Voltmeter

TEST PORT

An electronic pump RPM test port will be provided.

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

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

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

PRESSURE GAUGES

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

The gauges will be a minimum of 3.50" in diameter and will have white faces with black lettering.

Gauges will be compound type with a vacuum/pressure range of 30.00"-0-600#.

The individual pressure gauge will be installed as close to the outlet control as practical.

WATER LEVEL GAUGE

A Fire Research TankVision Pro model WLA300-A00 water tank indicator gauge will be installed on the pump operators panel. The gauge kit will include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The gauge will show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs will provide for a viewing angle of 180 degrees. The gauge case will be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features will be accessed from the front of the indicator module. The program will support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings will include flashing LEDs at 1/4 tank and down chasing LEDs when the tank is almost empty.

The gauge will receive an input signal from an electronic pressure sensor. The sensor will be mounted from the outside of the water tank near the bottom. No probe will be placed on the

interior of the tank. Wiring will be weather resistant and have automotive type plug-in connectors.

ADDITIONAL WATER LEVEL GAUGE

There will be two (2) additional Fire Research MaxVision model WLA280-A00 water tank remote indicators provided and installed upper rear corners of the crew cab, to the rear of the crew doors. The indicators will show the volume of water in the tank on Ninety six (96) easy to see super bright Tri-color LEDs. The indicator case will be waterproof, manufactured of Polycarbonate material with an integrated lens.

The remote indicator will indicate the level as a single color in Red for 25% or less, Amber color for up to 50% volume, Blue color for up to 75% volume and Green color for up to 100% volume. When the level reaches 25%, the red LEDs will begin flashing. When the level is empty, the red LEDs will scroll in a down-chasing motion and then flash three times.

It will have the program capability to adjust the brightness level for day time and night time viewing. The LEDs can also be programmed for different colors.

This module will be activated when the parking brake is applied.

CLASS "A" FOAM LEVEL GAUGE

A Fire Research TankVision Pro model WLA360-A00 cell/tank level indicator kit shall be installed on the pump operators panel. The kit will include an electronic indicator module, a pressure sensor, a 10' sensor cable and a tank vent. The indicator will show the volume of Class "A" foam concentrate in the cell/tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs will provide for a viewing angle of 180 degrees. The indicator case will be waterproof, manufactured of Polycarbonate/Nylon material and have a distinctive green label.

The program features will be accessed from the front of the indicator module. The program will support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display cell/tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low foam level warnings will include flashing LEDs at 1/4 cell/tank and down chasing LEDs when the cell/tank is almost empty.

The indicator will receive an input signal from an electronic pressure sensor. The sensor will be mounted from the outside of the foam cell/tank near the bottom. No probe will be placed on the interior of the cell/tank. Wiring will be weather resistant and have automotive type plug-in connectors.

STEP/LIGHT SHIELD

There will be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operators panel.

- There will be 12 volt DC white LED lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.

There will be a green pump engaged indicator light activated on at the operator's panel when the pump is shifted into gear from inside the cab.

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

ADDITIONAL STEP/LIGHT SHIELD

There will be an additional aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the passenger's side pump panel.

- There will be 12 volt DC white LED lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.

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

AIR HORN SYSTEM

Two (2) Grover, Model 1510, Stutter Tone air horns will be recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent the loss of air in the air brake system.

Air Horn Location

The air horns will be located on the left side of the bumper, outside of the frame rail.

AIR HORN CONTROL

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

ELECTRONIC SIREN
A Whelen, Model: 295HFSC9, 200 watt, dual tone, electronic siren with noise canceling microphone will be provided.

This siren to be active when the battery switch is on and that emergency master switch is on.

ELECTRIC SIREN, LOCATION,
Siren head will be mounted to be determined.

The electronic siren will be controlled on the siren head only. No horn button or foot switches will be provided.

SPEAKER
There will be two (2) speakers provided. Each speaker will be a Whelen model SA314B heavy duty version, 100-watt, in a black finish with optional SACSTFMP polished aluminum flange casting . Each speaker will be connected to the siren amplifier.

There will be one (1) speaker recessed in the passenger's side and one (1) speaker recessed in the driver's side of the front bumper.

AUXILIARY MECHANICAL SIREN
A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel.

The control solenoid will be powered up after the emergency master switch is activated.

The mechanical siren will be recessed in the front bumper on the right side. The siren will be supported by the bumper framework. The face of the siren will be flush with the face of the bumper. The hole in the bumper face will match the face of the siren.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

FRONT ZONE UPPER WARNING LIGHTS
There will be a 92.00" Whelen Freedom IV lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) amber flashing LED module in the driver's side rear corner position.
- One (1) red flashing LED module in the driver's side end position.
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) red flashing LED module in the driver's side first front position.
- One (1) red flashing LED module in the driver's side second front position.

- One (1) white flashing LED module in the driver's side third front position.
- One (1) red flashing LED module in the driver's side fourth front position.
- One (1) red flashing LED module in the driver's side fifth front position.
- One (1) red flashing LED module in the driver's side sixth front position.
- One (1) red flashing LED module in the driver's side seventh front position.
- One (1) 795 LED traffic light controller sent to national standard high priority in the center positions.
- One (1) red flashing LED module in the passenger's side seventh front position.
- One (1) red flashing LED module in the passenger's side sixth front position.
- One (1) red flashing LED module in the passenger's side fifth front position.
- One (1) red flashing LED module in the passenger's side fourth front position.
- One (1) white flashing LED module in the passenger's side third front position.
- One (1) red flashing LED module in the passenger's side second front position.
- One (1) red flashing LED module in the passenger's side first front position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side end position.
- One (1) amber flashing LED module in the passenger's side rear corner position.

There will be clear lenses.

The following switches may be installed in the cab on the switch panel to control the lightbar:

- a switch to control the flashing LED modules
- the traffic light controller will be with the roof light switch
- there will be a driver's side momentary cab switch with no emergency master control to activate the traffic light controller

The traffic light controller will be disabled when the parking brake is applied.

The 14 red flashing LED modules in the front positions and two (2) red flashing LED modules in the rear corner positions may be load managed when the parking brake is applied.

SIDE WARNING LIGHTS

There will be two (2) 21.50" Whelen Freedom IV LED lightbars mounted on the roof, one (1) on each side, over the crew cab doors.

Each lightbar will include the following:

- One (1) red flashing LED module in the outside rear corner position.
- One (1) blue flashing LED module in the rear outside position.

- One (1) red flashing LED module in the front outside position.
- One (1) red flashing LED module in the outside front corner position.

There will be clear lenses.

There will be a switch in the cab on the switch panel to control the lightbars.

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

CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6*C, LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be blue
- The passenger's side front inside warning light to be blue
- The passenger's side front outside warning light to be red

All four (4) lights will include a clear lens.

There will be a switch located in the cab, on the switch panel, to control the four (4) lights.

The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

HEADLIGHT FLASHER

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

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

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

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen, Model M6# split LED flashing warning lights with Whelen, Model M6FC chrome flanges located in the following positions:

Two (2) lights, one (1) each side on the bumper extension.

The side front lights to be red to the front and white to the rear.

Two (2) lights, each side of cab over wheel.

The side middle lights to be red to the front and amber to the rear.

Two (2) lights, rear fender panel.

The side rear lights to be red to the front and amber to the rear.

All six (6) lights will include a clear lens.

There will be a switch located in the cab on the switch panel to control the lights.

Any white warning lights will be disabled when the parking brake is set.

SIDE WARNING LIGHTS

There will be two (2) Whelen, Model M6* split LED flashing warning light(s) with chrome bezel(s) provided on the 45 degree angled corners of the bumper extension.

The color of the light(s) to be red to the front and white to the rear.

All of these lights will include a clear lens.

These lights will be activated with with the side warning switch.

Any white warning lights will be disabled when the parking brake is set.

SIDE WARNING LIGHTS

There will be one (1) pair of Whelen, Model RS*03ZCR, LED flashing lights provided one on each side of rear tailboard facing the side.

The color of the lights will be red.

The lights will be provided with a Whelen, Model RFLANGEC, chrome plated ABS flange.

The lights will be provided with a clear lens.

These lights will be activated with the side warning switch.

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

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen®, Model M6*, LED flashing warning lights will be located at the rear of the apparatus.

- The driver's side rear light to be blue
- The passenger's side rear light to be red

Both lights will include a lens that is the same color as the LED's.

There will be a switch located in the cab on the switch panel to control the lights.

WARNING LIGHTS (REAR)

There will be two (2) Whelen, Model M6* LED flashing warning light(s) with bezel(s) provided above the tail lights.

The rear light to be amber to the outside and red to the inside.

These light(s) will be controlled with a separate switch in cab.

These light(s) will include a lens that is clear.

REAR OF HOSE BED WARNING LIGHTS

There will be two (2) Whelen, Model B6MM**1P, LED beacon with lower LED flashing warning lights provided at the rear of the truck, one (1) each side.

Each light will include an LED flashing beacon and a Model 70*02F*R, red Super LED/red lens LED flashing light mounted in a polished aluminum housing.

The rear upper light(s) on the driver's side to be amber beacon.

The rear upper light(s) on the passenger's side to be amber beacon.

The beacons will be provided with both domes amber.

A switch will be provided in the cab, on the switch panel to control the beacons. The lower 700 LEDs will be activated with the rear upper warning switch.

The rear warning lights will be mounted on stainless steel brackets rear upper corners of hosebed so the whelen 700 series lights are at a 33 degree angle with all wiring totally enclosed. These brackets will also support the clearance/marker lights.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen model TANF85, 45.12" long x 2.35" high x 2.38" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen model TACTLD1 control head will be included with this installation.

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

This traffic directing light will be mounted over the hosebed, between the body side sheets, on a cross tube at the rear of the apparatus.

This installation will include a treadplate box.

The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position.

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

The following guidelines will apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

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

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

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

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

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

Operation

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

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

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

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

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.

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

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

Wiring Methods

Fixed wiring systems will be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

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

- Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

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

Wet Locations

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

All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.

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

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.

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

Listing

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

Electrical System Testing

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

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

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

Operational Test per Current NFPA 1901 Standard

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization.

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

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

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

GENERATOR

There will be one (1) Harrison 3.6 kW hydraulic generator provided.

This generator will be 31.00" long x 15.00" wide x 14.13" high and weigh 168 lbs.

This generator will have a 3,600 watt continuous duty rating @ 120 volts AC.

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

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

The generator hydraulic circuit will include a soft start valve to protect the generator components during PTO engagement.

There will be an AC volt meter furnished next to the circuit breaker panel to monitor the generator.

GENERATOR LOCATION

The generator will be mounted in the in the area over the pump on the left side. The flooring in this area will be either reinforced or constructed in such a manner that it will handle the additional weight of the generator.

GENERATOR START

There will be a switch provided on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL

A circuit breaker panel will be installed in the D3 high on rear wall forward. A directory for each breaker will be provided adjacent to the circuit breaker panel. Identification of circuits will be done in a durable manner that provides years of service.

AC POWERED TRIPOD LIGHTING

There will be two (2) Whelen, tripod light assemblies installed on the apparatus.

The light heads will be Whelen, Model PFP1AP1, 75 watt 120 volt AC lights with switches on the light heads.

The painted parts of this light assembly to be white.

The tripod assemblies will include 30.00" body with 20.00" legs.

The AC cable will exit at the bottom of the pole.

The lights will be installed on extendable poles, located rear beavertails each side.

The light(s) selected above will include a 20 amp, 120 volt twist lock receptacle and plug.

ELECTRIC CORD REEL

Furnished with the 120-volt AC electrical system will be an Akron cord reel. The reel will be provided with a 12-volt electric rewind switch that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

The reel will be capable holding 12/3, 600-volt cable or 10/3, 600-volt cable.

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

A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

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

A total of one (1) cord reel will be provided one (1) in compartment R1 high and to the right.

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

Reel Warranty
The electric reel will come with a **five (5)-year** warranty provided by the reel manufacturer.

CORD
Provided for electric distribution will be one (1) length installed on the reel of 100 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. No connector will be installed on the end of the cord.

POWER OUTLET STRIP
There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided shipped loose.

The strip(s) selected will be powered from the shoreline inlet.

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

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE
There will be two (2), 20 amp 120 volt AC three (3) wire twist lock receptacle(s) with waterproof flip up cover(s) installed D3 and P3 forward wall just above frame rail height. The NEMA configuration for the receptacles will be L5-20R.

The receptacle(s) will be powered from the on board generator.

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

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

LOOSE EQUIPMENT
The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

One (1) set of reflective emergency triangles will be provided.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9.3 and 5.9.4 will be provided by the fire department.

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) smoothbore of combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.
- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads.
- One (1) rubber mallet, for use on suction hose connections.
- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).

- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE

There will be no soft suction hose provided.

- One (1)-5.00" NST barrel strainer, chrome plated

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT - BODY PAINTED TO MATCH CAB

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

7. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
8. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.
9. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
10. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
11. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
12. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that

will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.

13. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacture.

Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading is used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T.standard in critical areas. These requirements are met in order for the exterior paint finish to be considered acceptable. The Pierce Manufacturing written paint standards will be available upon request.

The cab and the body will be painted Ford Color F1.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient

- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT/SEAL CHASSIS FRAME ASSEMBLY

The following components will be treated with epoxy E-coat protection prior to finish paint:

- Two (2) C-channel frame rails

The E-coat process will meet the technical properties shown.

FILM TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	PERFORMANCE
Color	–	Black
Film Thickness	–	0.5 - 1.5 Mils
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	100 in. - lbs. Minimum
Reverse Impact	ASTM D2794	60 in. - lbs. Minimum
Crosshatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM9508P	6 Minimum
Throwpower	GM9535P	12 - 15 in.

Cold rolled steel lab panels, Zinc Phosphate pretreatment, 0.6 mils average film thickness, cured 20 minutes @ 350°F.

PROPERTY	SUBSTRATE PRETREATMENT	SALT SPRAY* 1000 HOURS
Corrosion Resistance	CRS / Zinc Phos / Non-Chrome	1 - 2 mm

*Salt Spray - ASTM B117, cold rolled steel lab panels cured 20 minutes @ 350°F. (Average Total Scribe Creep)

Before the frame rails are finish painted, all areas will be sealed with a 3M 2084 metal sealant after the components are torqued to the frame rails:

- The joint between all crossmembers and the frame

- The joint between all spring hangers and the frame.

The chassis frame assembly will be finish painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be finish painted are:

- Frame rails
- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions

- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

After the chassis frame assembly is finish painted, the following non-torqued joints will be sealed with a SG-510A rust-proofing compound:

-All bolted on chassis components that could be vulnerable to rust, i.e. body mounting angles, air tanks, etc.

To summarize, all metal to metal contact components that are prone to rust, will be protected.

COMPARTMENT INTERIOR PAINT

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

REFLECTIVE OUTLINE STRIPE

A .25" black reflective outline will be applied to the top and the bottom of the reflective band. There will be two (2) set of outline stripes required.

CHEVRON STRIPING ON THE FRONT BUMPER

There will be alternating chevron striping located on the front bumper.

The colors will be fluorescent yellow green and red diamond grade.

The size of the striping will be 6.00".

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

LETTERING

One hundred twenty-one (121) to one hundred forty (140) reflective lettering, 3.00" high, with outline will be provided.

EMBLEM/S

There will be one (1) pair of reflective emblems, 18.00" to 20.00" wide, supplied and installed cab doors. The emblems will include the fire department's monogram or number inside of a circle with scrolling.

EMBLEM

A pair of emblems showing a "Star of Life" will be installed on the vehicle. The emblem will be made with reflective material. The size will be approximately 10.00" high x 10.00" wide.

CUSTOM CHASSIS RUST PROOF / UNDERCOAT

The rust proof/undercoat option will provide additional paint to the chassis frame rails and a protective coating that will help fight corrosion.

Rust proof / Undercoat Process

A coating will be applied to the custom chassis once the cab, pump and body mounting angles have been installed. The coating texture will be waxy and pliable after drying so it will not chip, crack, or peel off during normal vehicle operations.

The rust proofing material will be the color black, and is a coating of a corrosion inhibitor for long-term protection against corrosion.

The material will be applied to the following areas:

- Outside of the chassis frame rails (top & side)
- Top of the frame rails
- Top of crossmembers
- Inside of the frame rails - in and around harnesses keeping coating off harnesses as best as possible
- Between the frame and liner - coating will be applied after frame and liner are assembled using a wand to apply material between as best as possible
- Top of the body mounting angles (including rear platform)
- Top of air tanks
- Top of fuel tank

EQUIPMENT MOUNTING

Customer equipment mounting in the body compartments and cab will be included.

OVAL STRAPPING HERON RIB

two (2) roll (s) shall be provided and shipped loose with the truck for the department to install.

MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

One (1) compact disc (CD) will also be provided that will include all of the information from the above manual.

The manual will contain the following:

- Job number

- Part numbers with full descriptions

- Table of contents

- Parts section sorted in functional groups reflecting a major system, component, or assembly

- Parts section sorted in Alphabetical order

- Instructions on how to locate parts

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

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

One (1) compact disk (CD) will also be provided that will include all of the information from the above manual.

The manuals will contain the following sections:

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

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

MANUALS, CHASSIS OPERATION
Two (2) chassis operation manuals will be provided.

One (1) compact disk (CD) will also be provided that will include all of the information from the above manual.

ONE (1) YEAR MATERIAL AND WORKMANSHIP
A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY
A Detroit Diesel **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

STEERING GEAR WARRANTY
A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY
The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor Wabco™ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP
The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

COMPARTMENT LIGHT WARRANTY
The Pierce 12 volt DC LED strip lights limited warranty certificate, WA0203, is included with this proposal.

TRANSMISSION WARRANTY
The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

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

WATER TANK WARRANTY
A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY
The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY
A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

PUMP WARRANTY
A Waterous pump limited warranty certificate, WA0225, is included with this proposal.

TEN (10) YEAR PUMP PLUMBING WARRANTY
The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

FOAM SYSTEM WARRANTY
The Husky 3 foam system limited warranty certificate, WA0231, is included with this proposal.

SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY
A Harrison Hydra-Gen limited warranty certificate, WA0285, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION
A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

ONE (1) YEAR MATERIAL AND WORKMANSHIP
The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this proposal.

VEHICLE STABILITY CERTIFICATION
The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION
The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION
The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION
The fire apparatus manufacturer will provide a cab integrity certification with this proposal. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

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

Roof Crush
The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush
The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

Side Impact
The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact
The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact
The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION
Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION
Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION
Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.

AMP DRAW REPORT

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

The manufacturer of the apparatus will provide the following:

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

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