Fire Apparatus Quotation for:
FLORIDA SHERIFF'S ASSOCIATION BID

Quotation Number: 90139 Rev: 18

Unit Description: AERM-TYPN-075L

Quote Description: Aerial, Rear Mount, Aluminum, Typhoon, HP 75 Ladder Salesperson: DDANIELS

Salescode	Extended Description	Qty	
FRAME ASSEMBLY			
1250-0080	Frame assembly with 10.25 x 3.5 x .375 powder coated galvanized rails.	1	
1250-0083	Frame liner 9.375 x 3.125 x .375, galvanized and powder coated.	1	
1250-0092	GEOMET coated frame assembly fasteners.	1	
AXLE OPTIONS			
1025-0018	Meritor RS-30-185 single rear axle 31,000 lb. capacity.	1	
1025-0028	Koni shock absorbers for front axle - adjustable.	1	
1025-0227	Meritor FL941 front axle 20,000 lbs. Includes maintenance free bushings.	1	
SUSPENSIONS			
1070-0012	Reyco rear suspension springs rated equal to the capacity of the axle.	1	
TIRE OPTIONS			
1060-0046	Two Michelin 425 tires model XFE for front axle.	1	
1060-0117	RWC AirGuard LED tire pressure monitoring valve stem caps (6) for single rear axle applications.	1	
1060-0174	Four Michelin 315 tires model X Multiway 3D XZE for rear axle	1	
BRAKE SYSTEMS			
1100-0001	Meritor EX225H 17" disc brakes for front axle.	1	
1100-0002	ArvinMeritor 16-1/2" x 7" S-cam brakes with cast brake drums for a single rear axle.	1	
1100-0005	Brake system air 4X2/4X4.	1	
1100-0006	Parking brake release mounted on the driver's side lower dash.	1	
1100-0024	G4 Electronic Stability Control (4x2), Includes RSC and ATC. Not available on 4x4, commercial chassis or tiller.	1	

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TESTING COMPLIANCE STANDARD			
1001-0065	The E-ONE supplied components of the vehicle shall meet the requirements of NFPA 1901, 2016 edition.	1	
3090-0001	Hosebed hoseload allowance on the apparatus shall be 1000 lbs.	1	
3090-0002	OAH. Unit has no overall height restrictions.	1	
3090-0004	OAL. Unit has no overall length restrictions.	1	
3340-1137-12C	Equipment allowance on the apparatus shall be 2500 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.	1	
BUMPERS			
1160-0000	Bumper 10" stainless steel.	1	
1160-0008	3/16" Front Bumper Gravel Shield.	1	
1160-0013	16" Front Bumper Gravel Shield Extension.	1	
WHEEL OPTIONS			
1050-0001	Alcoa aluminum wheels for front axle (2).	1	
1050-0003	Alcoa aluminum wheels for rear axle (4).	1	
1050-0007	Front axle wheel trim kit. Includes stainless steel lug nut covers (chrome plated plastic if applicable) and center cap with E-ONE logo. Note: Center cap will have an inspection port IPO a logo if equipped with Stemco oil seals.	1	
1050-0008	Rear axle (single) wheel trim kit. Includes stainless steel lug nut covers (chrome plated plastic if applicable) and center cap with E-ONE logo. E-ONE custom chassis w/steel wheels will have chrome plated plastic lug covers.	1	
AIR SYSTEM OPTIONS			
1110-0000-001	Inlet for air system. Location: driver door jamb.	1	
1110-0002	Air dryer Bendix AD-9.	1	
1110-0006	Air lines nylon.	1	
1110-0026	Air horns recessed in bumper (PR).	1	
ENGINES & TRANSMISSIONS			
1200-0017	Push-button transmission shift selector.	1	
1200-0020	TranSynd, Shell Spirax S6ATF A295, or equivalent synthetic transmission fluid for EVS3000.	1	
1200-0096	Electronic speed limiting set at 60 MPH.	1	
1200-0341	Eng/Trans Cummins L9 450HP/EVS3000 2017 EPA compliant engine.	1	

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SECONDARY BRAKING			
1125-0002	Jacobs engine compression brake.	1	
1125-0023	Transmission to seek second gear when Jacobs engine brake or Telma retarder is engaged. N/A with Trans retarder.	1	
COOLING PACKAGE			
1800-0013	Cooling system for use with Cyclone II X, Typhoon X, and Quest chassis. For use with 2010 - 2018 EPA engines. Includes coolant recovery system.	1	
FUEL SYSTEMS			
1350-0003	Fuel system 50 gallon.	1	
1350-0022	Fuel line hose rubber.	1	
ALTERNATOR			
1700-0005	Alternator Leece Neville 320 amp. 320 amp SAE/272 amp NFPA.	1	
BATTERIES			
1400-0002	Battery four group 31 1000 CCA.	1	
CHASSIS OPTIONS			
1680-0005	Thermatic fan clutch.	1	
1680-0006	Drivelines 1710.	1	
1680-0012	Tow eyes rear frame painted black.	1	
1680-0042	Tow hooks front painted in the down position.	1	
1680-0051	Aerial hydraulic activation system.	1	
1680-0250-J74	Diesel Exhaust Fluid (DEF) 5 gallon tank. Location: R1 floor offset forward.	1	
CAB MODEL			
1520-0219	Typhoon medium cab with radial wipers (58" CA).	1	
CAB ROOF TYPE			
1615-0010	Cab roof to be "flat" (non-vista).	1	
CAB BADGE PACKAGE			
1610-0000	Cab and body to have applicable E-ONE logos.	1	
CAB DOOR OPTIONS			
1550-0003	Rear crew cab doors in the medium position.	1	
1550-0080-000-G6	Red/Lemon Yellow chevron "A" printed stripe on lower cab door panel approx 12"	1	

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CAB DOOR OPTIONS			
	high. Stainless steel/painted door panels only. E-ONE cabs only.		
1550-0083	All cab exterior access doors to have CH751 keyed locks.	1	
1550-0159	Interior cab door locks - manual. Will be individually actuated from each respective door. Includes key lock on each exterior cab door handle.	1	
1550-0185	Cab door panels aluminum painted Zolatone to match cab interior paint. Includes upper and lower panels with seam below handrail.	1	
1550-0283	Driver and officer cab door windows with manual regulators. For use with new Typhoon cab.	1	
1550-0284	Rear crew cab door windows with manual regulators. For use with new Typhoon cab.	1	
1550-0287	Cab doors to be barrier style. For use with new Typhoon cab only.	1	
CAB STEP OPTIONS			
1640-0047	Lower steps to extend 3.5" past cab. For use with 2019 Typhoon and Cyclone / pre-2019 Typhoon with barrier doors.	1	
MIRRORS			
1670-0002-274	Ramco 6001MCR mirrors. Remote controlled with bottom manual convex. Location: mounted on front corners of cab.	1	
MISC EXTERIOR CAB OPTIONS			
1550-0020	Windows cab side fixed driver's side.	1	
1550-0033	Windows cab side fixed officer's side.	1	
1675-0022	Pair of 18" handrails located just behind driver and officer front door one each side.	1	
1675-0023	Pair of 18" handrails located just behind driver and officer rear door (ALS doors if equipped) one each side.	1	
1675-0030	Mud flaps, front, black with E-ONE logo.	1	
1675-0047	Rear cab wall to be 3/16" aluminum diamond plate.	1	
1675-0201	Large radius cab wheel well. Includes bolt-on adjustable wheel well trim.	1	
1675-0202	Mounting plate for battery charger receptacle, indicator, air inlet, etc (if applicable). Plate to be removable brushed stainless steel.	1	
HVAC			
1515-0048	Controls for heating and air conditioning shall be located in the driver side lower dash area. For use without front air bags only.	1	
1515-0099	Air conditioning with radiator mounted condenser for use with Cummins L9 and X12 engine. Includes reduced profile evaporator w/powder coated cover and	1	

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HVAC			
	electronic controls.		
SEATS			
1510-0003	Seats, Inc. brand 911 cab seats.	1	
1510-0008	Seat color gray.	1	
1510-0035-147	Universal air pack bottle bracket (EA). Location: officer's seat.	1	
1510-0035-148	Universal air pack bottle bracket (EA). Location: rear facing driver's side.	1	
1510-0035-215	Universal air pack bottle bracket (EA). Location: rear facing officer's side.	1	
1510-0038	Driver seat 911 air ride.	1	
1510-0042	Officer seat to be 911 fixed SCBA.	1	
1510-0050	Rear facing 911 seat with SCBA driver's side.	1	
1510-0053	Rear facing 911 seat with SCBA officer's side.	1	
1510-0234	Seat cover material Turnout Tuff.	1	
1685-0031	Seating capacity tag of four occupants.	1	
MISC INTERIOR CAB OPTIONS			
1685-0000	Cab interior gray. Does not include engine cover or seat color.	1	
1685-0005	Lexan sun visors, driver and officer's side overhead.	1	
1685-0187	Severe duty engine cover, molded polyurethane.	1	
1685-0446	Severe duty overhead console. Includes driver, center and officer overhead ahead of air conditioning plenum. Center overhead includes siren mounting locations. Overhead to match cab interior.	1	
1685-0531	Reduced profile rear engine cover for increased legroom.	1	
1685-0669	Severe duty dash package with low profile center section. Cast alum construction. Includes smooth plate alum lower kick panels; all painted to match cab interior.	1	
1685-0692	Cab insulation package. Includes insulation for ceiling, front wall, rear wall, side walls, below seat risers and in doors.	1	
CAB ELECTRICAL OPTIONS			
1750-0046-195	Cab Headlights. Position: lower.	1	
1750-0059-179-04	Receptacle inlet 20 amp with a Yellow cover. Location: outside driver's door next to handrail.	1	
1750-0075	English dominant main cab gauge cluster.	1	
1750-0083-172	Turn signal Federal Signal QuadraFlare QL64Z-ARROW LED amber pair located	1	

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CAB ELECTRICAL OPTIONS			
	upper headlight bezel.		
1750-0158	Dome Lts Red/White LED. Package includes two lights mounted in the front and two mounted in the rear of the cab. White light wired through door and light assembly switch. Red light through light assembly switch.	1	
1750-0166	ATC override switch.	1	
1750-0198-A31	Battery charger to be located behind driver's seat.	1	
1750-0343	Battery charger E-ONE LPC 20. 120 volt inlet, 20 amp output. Includes status indicator panel.	1	
1750-0449	Momentary DPF regeneration override switch.	1	
1750-0554	FireTech LED cab headlights.	1	
1750-0666	Aerial PTO hourmeter in cab.	1	
1750-0764	Daytime Running Light TecNiq LED strip (PR) with polished alum housing located between quad headlight bezels (New Typhoon only).	1	
1750-0768	TecNiq D07 LED cab door step area lighting. Includes (2) lights at each door area. Lights to be switched with door ajar.	1	
BODY MODEL			
3080-0008	Body aerial HP75 / HP78 with center hose bed. Configured for midship pump and 400-500 tank. Single axle 100" wide body. Includes L and R rescue style high sides. The rear turntable access door to match the rear body finish.	1	
BODY COMPT REAR			
3110-0027	Rear body panels to be un-painted extrusions with un-painted smooth plate body panels or just unpainted smooth plate to facilitate rear body striping.	1	
AERIAL BODY OPTIONS			
3310-0032	Recessed tubes for (6) pike poles. Not available on HP75 SideStacker.	1	
3310-0037	Rear ladder tunnel doors. Vertically hinged diamond plate.	1	
3310-0051	Crosslay double to hold up to 200' of 2.0" DJ (each). Includes storage pan to rear of crosslays (if applicable).	1	
3310-0161	Jack leg opening covers diamond plate (2) sets. Includes diamond plate outrigger covers and fixed diamond plate filler panels.	1	
3310-0314	Auxiliary jack pad 24X24 (2) with 20 degree formed handle. Includes mounting brackets.	1	
DOORS			
3300-0007-003	Door single vertical hinged painted. Location(s): L1	1	

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DOORS			
3300-0007-015	Door single vertical hinged painted. Location(s): R1	1	
3300-0011-005	Door single horizontal hinged lift-up box pan configuration painted. Location(s): L3	1	
3300-0011-006	Door single horizontal hinged lift-up box pan configuration painted. Location(s): L4	1	
3300-0011-017	Door single horizontal hinged lift-up box pan configuration painted. Location(s): R3	1	
3300-0011-018	Door single horizontal hinged lift-up box pan configuration painted. Location(s): R4	1	
3300-0292-004	Door double 3-point vertical hinged w/rotary latches - painted. Location(s): L2. Includes latch handle extension installed on secondary door's interior latch with "PULL" tags using .125 plate.	1	
3300-0292-007	Door double 3-point vertical hinged w/rotary latches - painted. Location(s): L5. Includes latch handle extension installed on secondary door's interior latch with "PULL" tags using .125 plate.	1	
3300-0292-016	Door double 3-point vertical hinged w/rotary latches - painted. Location(s): R2. Includes latch handle extension installed on secondary door's interior latch with "PULL" tags using .125 plate.	1	
3300-0292-019	Door double 3-point vertical hinged w/rotary latches - painted. Location(s): R5. Includes latch handle extension installed on secondary door's interior latch with "PULL" tags using .125 plate.	1	
SHELVES			
3370-0246	Adjustable shelf for non-transverse compartments. Location:	10	
3370-0247	Tracks for adjustable shelf and/or adjustable tray in a compartment. Location:	10	
COVERS			
3305-0007-000-02	Vinyl Red hose bed cover with attached rear flap(s).	1	
3305-0008-000-02	Vinyl Red crosslay cover with attached side flaps.	1	
3305-0096	Cover for compartment mounted DEF tank. Includes hinged fill access door. Material and finish to match compartment walls.	1	
PUMP MODULE			
3130-0075	Pump panel opening is 45.5" wide.	1	
PUMP PANELS			
3134-0016	Stainless steel driver and officer side pump panels.	1	
3134-0055	Officer side upper pump access panel to be horizontally hinged with stainless	1	

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PUMP PANELS			
	steel door. Includes (2) push button latches and (2) hold open devices.		
MISC PUMP PANEL OPTIONS			
4460-0003	Pump panel tags color coded per NFPA compliance.	1	
PUMP MODULE OPTIONS			
3136-0011	P-Rubber in flex joint(s) between pump module and/or body modules.	1	
WATER TANK			
4010-0196	400 gallon "T" water tank. UPF Poly III blue fill tower.	1	
TANK PLUMBING			
4450-0010	2" tank fill Akron manual valve.	1	
4450-0022	3" tank to pump Akron manual valve.	1	
LADDER STORAGE / RACKS			
3365-0015-809	Dual ladder tunnel for HP75 / HP78. Ladder rack to hold: PEL3-35, PEL-24, (2)PRL-16 and FL-10 with rubber block feet. Requires roof ladder option on base section of aerial to meet 115' NFPA requirement	1	
3365-0016	Box type enclosure for forward end of ladder tunnel. Required on center HB HP75 / HP78 with ladder tunnel doors.	1	
HANDRAILS / STEPS			
3330-0001	Slide-out platform, integral driver side running board (includes hand rail as applicable).	1	
3330-0242	Flop down 36" wide step (EA) fabricated from .125" diamond plate with gator grip to be located at rear of body for access to turntable. Includes mechanical lock to store in the up and stored position.	1	
MISC BODY OPTIONS			
3340-0015	Diamond plate single axle wheel well. Includes bolt-on composite wheel well liners and aluminum trim fenderettes.	1	
3340-0035	Divider Long. To run full length of hose bed (front to rear).	1	
3340-0093	Mud flaps, rear, black with E-ONE logo.	1	
3340-1648	Anodized aluminum trim on bottom edge of all body compartment openings including pump enclosure if applicable with painted edges.	1	
SCBA BOTTLE STORAGE			
3320-0061	SCBA Bottle Storage. (4) Cast Product SCBA bottle storage doors. (2) each side in rear wheel well area.	1	

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SCBA BOTTLE STORAGE			
3320-0100	Strap, loop style to retain SCBA bottle(s). Locate one per bottle in each exterior body storage compartment.	1	
PUMPS			
4005-0030	Rating 1250 GPM	1	
4005-0099	Hale Pump Pro-Tech Extended 3 Year Warranty in addition to the standard 2 year warranty.	1	
4005-0195	Hale QFLO 750-1250 GPM pump, single stage. Requires primer option.	1	
PUMP CERTIFICATION			
4475-0000	Pump certification 750-2250 GPM	1	
PUMP OPTIONS			
4015-0002	Mechanical speed counter for Hale pumps.	1	
4015-0029	Hale pressure relief valve. Hale Qmax, or Qflo only.	1	
4015-0037	Engine throttle, vernier.	1	
4015-0053-198	Steamers to be Flush + 1". Location: driver's side.	1	
4015-0053-199	Steamers to be Flush + 1". Location: officer's side.	1	
4015-0073	Manual operated master pump drain. The master drain shall be clearly marked and placed in accessible location below running board on driver side (or area directly to rear of panel if no room below panel).	1	
4015-0210	Pump cooler with Innovative Control 1/4 turn valve with "T" handle and label.	1	
4015-0238	Hale electric primer (oil-less).	1	
INTAKES			
4440-0005	2.5" Left Intake Akron Manual Valve.	1	
INTAKE OPTIONS			
4445-0009	Intake relief valve, Akron.	1	
DISCHARGES AND PRECONNECTS			
4415-0012-654	1.5" Crosslay with Akron manual valve. Location: crosslay 1 & 2.	2	
4415-0161-581	2.5" Left Panel Discharge Akron Manual Valve w/30 Degree Chrome Droop. Location: left side discharge 1.	1	
4415-0161-582	2.5" Left Panel Discharge Akron Manual Valve w/30 Degree Chrome Droop. Location: left side discharge 2.	1	
4415-0164-583	2.5" Right Panel Discharge Akron Manual Valve w/30 Degree Chrome Droop.	1	

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DISCHARGES AND PRECONNECTS			
	Location: right side discharge 1.		
4415-0164-584	2.5" Right Panel Discharge Akron Manual Valve w/30 Degree Chrome Droop. Location: right side discharge 2.	1	
4415-1274	4" waterway discharge w/ Akron electric valve. Requires valve controller option.	1	
DISCHARGE OPTIONS			
4417-0175	Innovative Controls push/pull valve controls with locking T handles.	1	
4417-0176	Innovative Controls 3/4" bleeder/drain valve include lift lever with ergonomic grip.	7	
4417-0185	Innovative Controls discharge and intake bezels with integral color code and verbiage for side mount pump panel.	1	
4417-0313-359	Akron 9333 Navigator Pro 2 electric valve controller with full color LCD display. Locate on pump operator panel to control waterway discharge.	1	
GAUGES			
4435-0069	Class 1 ENFO IV system on pump operator's panel.	1	
4435-0083	Innovative Controls 10 LED SL series water tank level gauge. On pump panel.	1	
4435-0246	2.5" Innovative Controls stainless steel case pressure gauge (0-400) with color code bezel.	7	
4435-0247	4" Innovative Controls stainless steel case master pressure gauges with bezel. Intake 30-0-400, and discharge 0-400.	1	
ELECTRICAL SYSTEMS			
5010-0013-171	Vehicle data recorder - 2009 / 2016 NFPA compliant. Includes occupant detection with display. Display location: driver's overhead.	1	
5010-0039	V-MUX Electrical system for aerials.	1	
5010-0094	Nanoprotech corrosion inhibiting spray coating to be applied on all exposed electrical connections.	1	
5010-0100	AXIS Smart Truck Technology. Includes roof mounted antenna and 5 year data plan. For use only with E-ONE chassis in the USA.	1	
5010-0121-339	LCD Info Center (text display) for V-MUX electrical system. Location: center of dash.	1	
LIGHT BARS			
5300-0354-034	Light bar Federal Signal Split Vision VSLR6. Two (2) 21" 3-pod light bars w/ (3) red pods on each bar with red lenses. Location: front cab corners.	1	
WARNING LIGHT PACKAGES			
5550-0055-537	Federal Signal QuadraFlare LED lower level warning light package. Includes (10)	1	

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WARNING LIGHT PACKAGES			
	QL64 LED light heads with bezels. Locate side facing lights: at forward most position, on side of cab down low just ahead of rear door, and on rear fixed outrigger cover.		
5550-0069	Flash rate for Federal QuadraFlare and/or FireRay LED lower level warning lights to be set at DoubleFlash 150 - Simultaneous.	1	
WARNING LIGHTS			
5600-0034-285-08	Federal model SY12FS Sentry (PR) with driver red, officer amber domes. Location: each side at upper rear of body on aerial style brackets, top of light even with top of body.	1	
5600-0105-170	Hazard (door ajar) light 2" LED. Location: center overhead.	1	
SIRENS			
5500-0009	Federal PA300 electronic siren recessed mounted.	1	
5500-0024-170	The primary electronic siren control is to be located center overhead.	1	
SPEAKERS			
5510-0029-209	Speaker, Federal Signal Dynamax ES100 with "E-ONE" grille through bumper. Location: driver side front bumper.	1	
DOT LIGHTING			
5150-0017	License plate light LED with chrome housing located at the rear of the body.	1	
5150-0026	Marker light Truck-Lite LED body/cab package. E-ONE custom cab with aerial ladder, Mid-Mount platform or Bronto bodies only.	1	
5150-0032	Bracket license plate at rear of body.	1	
5150-0059	Federal Signal QuadraFlare LED vertical mount tail lights. Includes LED stop/tail, arrow turn and back-up lights with vertical Cast 3 housing and weatherproof connectors.	1	
LIGHTS - COMPARTMENT, STEP & GROUND			
5380-0012	Compartment light package Truck-Lite LED for medium bodies.	1	
5380-0032	Ground light package LED - large.	1	
5380-0036	Step light package body LED - small.	1	
5380-0325	EON LED ladder tunnel light (EA).	2	
LIGHTS - DECK AND SCENE			
5390-0058-457	Deck Lights - Truck-Lite LED model 81380 (PR). Location: (1) each side of body rear facing up high.	1	

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LIGHTS - DECK AND SCENE			
5390-0076	Hose bed light Truck-Lite LED model 81380. Locate at front of hose bed. Switched with work light switch in cab.	1	
5390-0102	Crosslay light Truck-Lite LED model 81380. Locate to rear of crosslay (SM) and forward of crosslay (TM as applicable). Switched with work light switch in cab.	1	
LIGHTS - NON-WARNING			
5400-0011	LED pump compartment light (EA).	1	
5400-0224	Engine compartment light Optronics LED Series ILL22 (EA).	1	
5400-0259	TecNiq model E10 pump panel LED light package with (3) lights per side pump panel. Pump panels over 45" may require additional lights. Side mount only.	1	
CONTROLS / SWITCHES			
5100-0000-198	Foot switch to control air horns located driver's side.	1	
5100-0000-199	Foot switch to control air horns located officer's side.	1	
5100-0009	Audible door ajar alarm wired through door ajar light.	1	
CAMERAS / INTERCOM			
5350-0156	FRC ACT 2-way aerial intercom.	1	
MISC ELECTRICAL			
5110-0017	Back-up alarm 97 dB.	1	
AERIAL MODEL			
6100-0005	Ladder HP75 with waterway. Includes left side console with cover, split steps at tip and jack leg flood lights.	1	
AERIAL HYDRAULIC SYSTEM OPTIONS			
6150-0003-216	Gauge aerial hydraulic oil level. Electronic display to be located on pump operator's panel.	1	
AERIAL CONTROLS			
6850-0026	Direct hydraulic aerial control system.	1	
MONITORS			
6300-0077	Monitor Akron StreamMaster II w/5177 electric nozzle 1000 GPM for ladder. Includes tip and base controls.	1	
AERIAL WARNING LIGHTS			
6550-0001	Outrigger warning lights (PR) LED. Truck-Lite model 91R.	1	

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AERIAL LIGHTING			
6560-0041	Whelen LED model PFBP12C at base (PR).	1	
6560-0163-231	Light Whelen Micro Pioneer model MPPWCS low profile pedestal mount with a white housing with chrome cover. Switched at light head and base console. Location(s): left side tip.	1	
WATERWAY OPTIONS			
6350-0000	Pinned waterway - upgrade. Waterway pins to section 2 or 3 on HP75 / HP78 and to section 3 or 4 on LTH100, HM100, HR100 and CR100.	1	
6350-0005	Rear 4" NST waterway inlet for rear mounted aerials. Includes chrome cap.	1	
6350-0010	Flowminder with single readout and totalizer for the aerial waterway to be located at the aerial control station.	1	
6350-0067	2.5" Innovative Controls stainless steel case pressure gauge (0-400) with color code bezel. Locate next to waterway inlet.	1	
AERIAL EQUIPMENT			
6500-0025	Rear hand rail extension (PR) on turntable for center access step on rear of the body. HP75 / HP78 center hose bed only.	1	
SIGN PLATES			
6750-0000-000-18	Aerial sign plates 10 x 144 (PR). Available on Booms, HP75 and HP100 only. Does not include lettering. Color: FLNA4006 White.	1	
AERIAL TESTING			
6900-0000	Aerial flow test - 3rd party.	1	
6900-0007	Aerial 2016 NFPA Certification.	1	
HOSE / NOZZLES			
7700-0018	Soft Suction Hose 6" X 15' with Long Handle Chrome Couplings.	2	
GROUND LADDERS			
7800-0002	Alco-Lite FL-10, 10' folding ladder without shoes.	1	
7800-0010	Alco-Lite PRL-16' roof ladder.	2	
7800-0016	Alco-Lite PEL-24' 2-section extension ladder.	1	
7800-0023	Alco-Lite PEL3-35' 3-section extension ladder.	1	
MISC LOOSE EQUIPMENT			
7900-0014	DOT Required Drive Away Kit - Kit includes three (3) triangular warning reflectors with carrying case. This kit is for the end user and is to remain with the truck.	1	

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EXTERIOR PAINT			
8100-0084	All applicable pump/pre-connect application modules are to have a job color finish. Includes upper and lower pump modules, crosswalk module and/or speedlay/pre-connect module (as applicable). Rear mounted body/pump module to be painted job color.	1	
8100-0116	Rear body surface to have a sanded finish (not painted job color). Includes hinged doors that do not have discrete sales codes and removable panels.	1	
8100-0176-000-17	Paint E-ONE chassis cab - Sikkens paint. Color: FLNA3225E-1 Red.	1	
8100-0183-000-17	Paint Body - Large - For Aerials, T/A Tankers/Wetsides, Rear Mounts and Rescues. Sikkens paint. Color: FLNA3225E-1 Red.	1	
8100-0356	Paint lift cylinders, extension cylinders and upper turntable steelwork FLNA4006 white (does not apply to TT deck).	1	
INTERIOR PAINT			
8150-0011	The interior of the cab to be painted Zolatone gray.	1	
8150-0024	The lower area of the painted cab interior door panels to be masked off and left un-painted for reflective material.	1	
STRIPING			
8200-0015	White reflective tape on (2) outriggers.	1	
8300-0042	White rubrail scotchlite insert.	1	
8300-0084-000-G6	Chevron "A" style 6" printed sheet Scotchlite striping full width on rear of body. Includes rear facing extrusions, panels and doors. Colors to be Red/Lemon Yellow.	1	
8300-0330	Single NFPA Scotchlite Stripe - upto 6" wide and straight on cab and the body. Size, color and location as specified by the customer.	1	
8300-0381	Yellow perimeter marking to indicate designated standing / walking areas above 48" high in compliance with 2016 NFPA 1901 consisting of individual Reflexite diamonds approximately 1" wide. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.	1	
GRAPHICS			
8400-0022	Logo E-ONE (PR) on aerial lift cylinder. Logo to be black and white reflective material approx 14" long located midway along outward surface of cylinder.	1	
8400-0060	Graphics drawing showing striping, lettering and logos. Requires E-ONE installed graphics.	1	
WARRANTY / STANDARD & EXTENDED			
9100-0000	Standard 1 Year Warranty.	1	

Salescode	Extended Description	Qty	
WARRANTY / STANDARD & EXTENDED			
9100-0003	Lifetime Frame Stuctural Warranty.	1	
9100-0004	10 Year/100,000 Mile Structural Warranty for Alum Cab / Body - Statement of Warranty.	1	
9100-0005	10 Year Stainless Steel Plumbing Warranty - Statement of Warranty.	1	
9100-0007	20 Year Aerial Device Structural Warranty - Integrity Limited Warranty.	1	
9100-0019	10 Year Limited Paint and Perforation Warranty - For Sikkens Paint.	1	
9100-0090	25 Year frame rail corrosion warranty. Includes liners (if equipped).	1	
9100-0101	Meritor 5 year unlimited miles, parts and labor front axle warranty for non-drive axle or a 2 year unlimited miles, parts and labor warranty for front drive axle.	1	
9100-0102	Meritor 5 year unlimited miles, parts and labor rear drive single or rear drive tandem axle warranty.	1	
SUPPORT, DELIVERY, INSPECTIONS AND MANUALS			
9300-0000	Vehicle familiarization aerial (Domestic). 3 days. Use 9300-0315 for additional days.	1	
9300-0009	Manuals, Operator and Service in digital format.	1	
9300-0012	Pump panel approval drawings. Will be provided on purchased units prior to construction.	1	
9300-0016	Approval Drawings-Standard.	1	
9300-0018	Manuals, Operator and Service in digital format (additional).	1	
9300-0031	Dash/Console panel layout approval drawings. Will be provided on purchased units prior to construction.	1	
9300-0316	Fire Apparatus Safety Guide published by FAMA, latest edition.	1	
Price Adjustment			
Y15	SALES PROGRAMS	1	Automatic Progam Concession
Dealer Supplied Equipment			

FLORIDA SHERIFF'S ASSOCIATION
TALLAHASSEE, FL

QUOTE 90139

AERIAL BODY

E-ONE TYPHOON CHASSIS

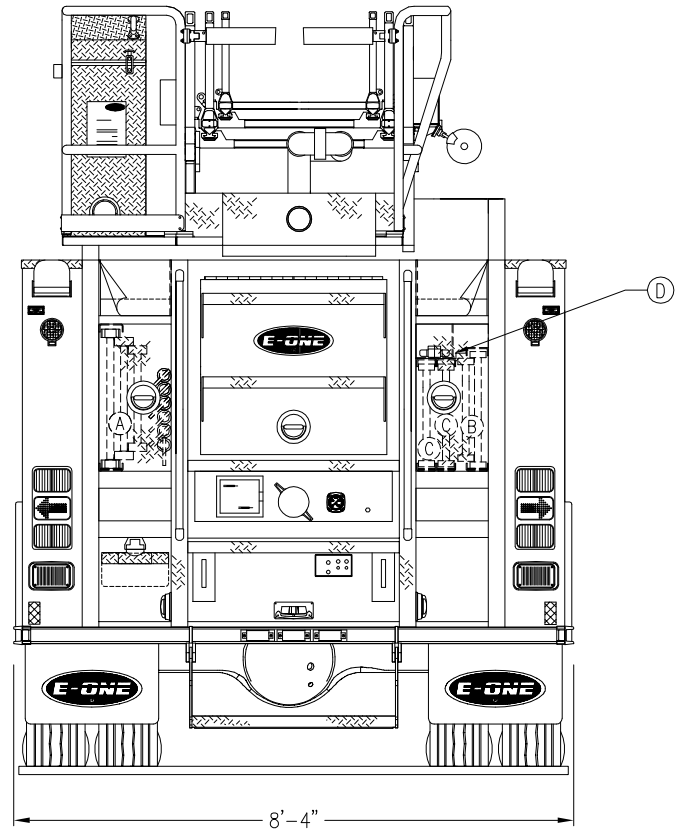
HP75 AERIAL LADDER

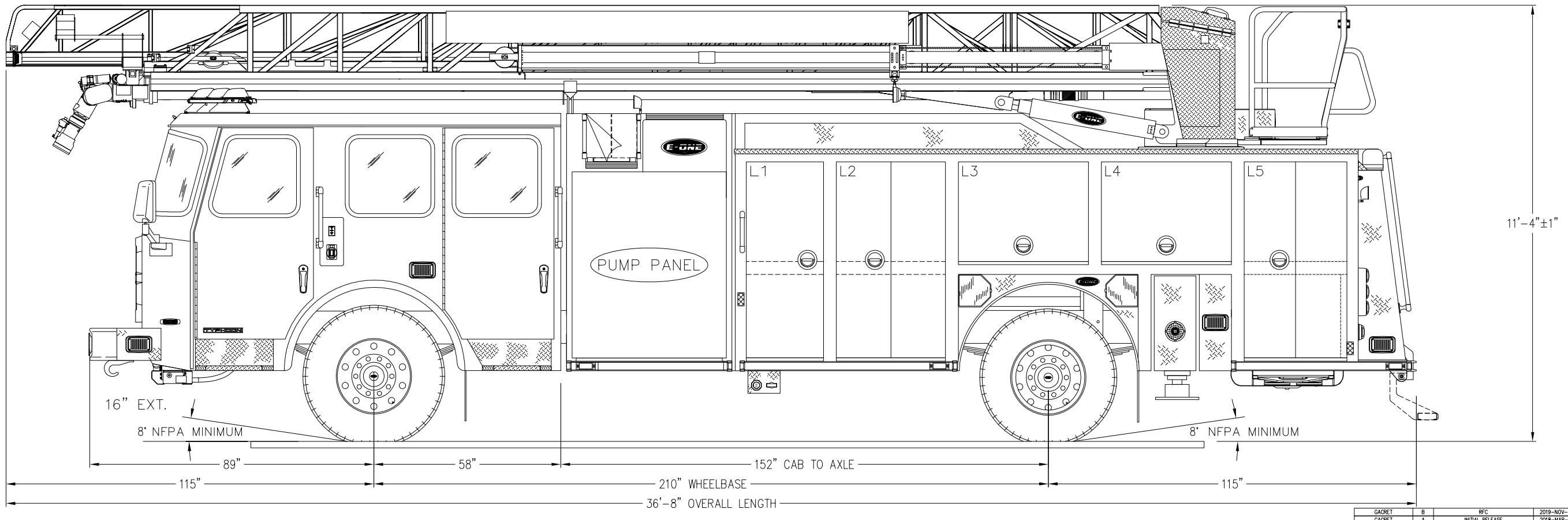
1250 G.P.M. HALE Q-FLO PUMP 400 GALLON WATER TANK	HOSELOAD
	NFPA COMPLIANT

COMPT.	OPENING	INTERIOR DIMENSION
L1/R1	24W 61H	24W 35H 12D UPPER 24W 26H 26D LOWER
L2/R2	34W 61H	34W 35H 12D UPPER 34W 26H 26D LOWER
L3/L4	40W 31H	40W 35H 12D
R3/R4	40W 31H	40W 35H 12D
L5/R5	32W 61H	32W 35H 12D UPPER 32W 26H 26D LOWER

DEALER SUPPLIED GROUND LADDERS

ITEM	LADDER LENGTH	MODEL NUMBER	QTY.
A	35' 3-SECT.	PEL3-35	1
B	24' 2-SECT.	PEL-24	1
C	16' ROOF	PRL-16	2
D	10' FOLDING	FL-10	1





GACRET	B	RFC	2019-NOV-25	GACRET
GACRET	A	INITIAL RELEASE	2018-MAR-12	GACRET
DRAWN BY	REV	DESCRIPTION	DATE	APPROVED
		APPROVAL REVISIONS		SHEET 1 OF 2

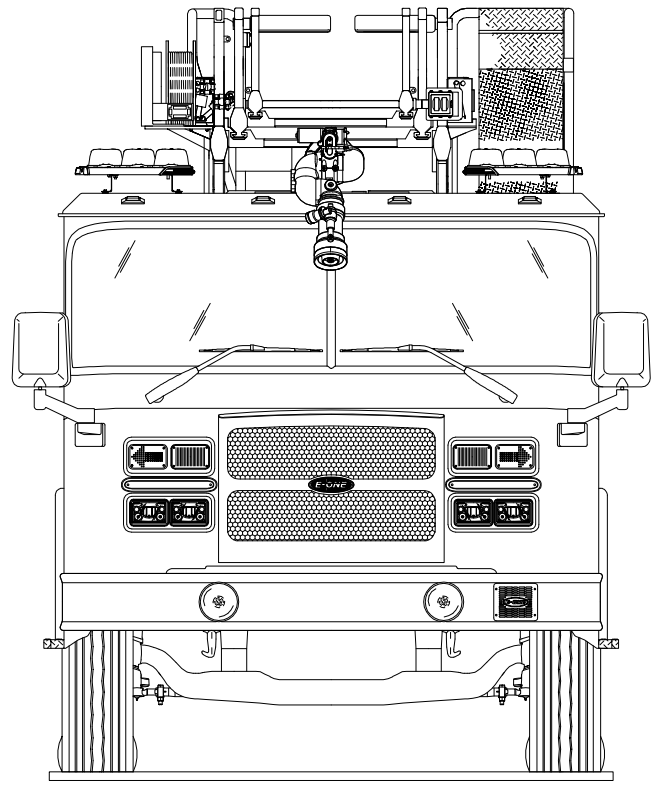
FLORIDA SHERIFF'S ASSOCIATION
TALLAHASSEE, FL

QUOTE 90139

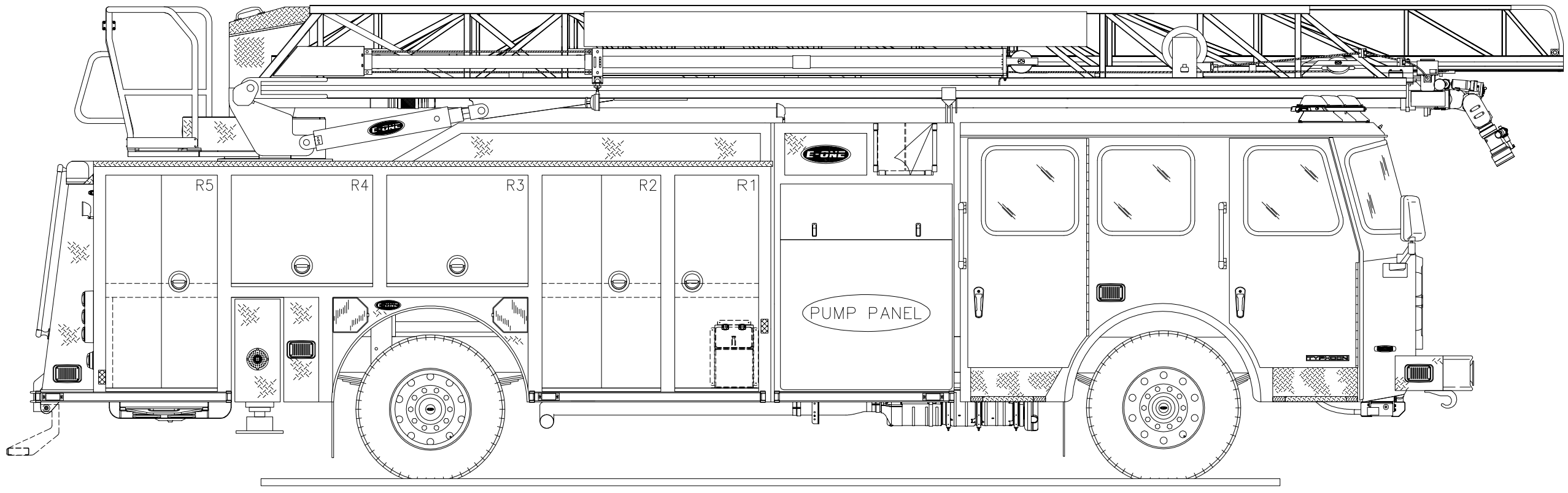
AERIAL BODY

E-ONE TYPHOON CHASSIS

HP75 AERIAL LADDER



THIS DRAWING IS FOR REFERENCE PURPOSES. ALL DIMENSIONS ARE SUBJECT TO MINOR VARIATIONS DUE TO MANUFACTURING PROCESSES.



GACRET	B	RFC	2019-NOV-25	GACRET
GACRET	A	INITIAL RELEASE	2018-MAR-12	GACRET
DRAWN BY	REV	DESCRIPTION	DATE	APPROVED
APPROVAL REVISIONS				SHEET 2 OF 2

FSA20-VEF14.0
Fire Rescue Vehicles & Other Equipment

Spec 9

75 FOOT REAR MOUNT
SINGLE AXLE AERIAL LADDER

1250 GPM PUMP
400 GALLON WATER TANK

TABLE OF CONTENTS

TESTING COMPLIANCE STANDARD

Hose Bed Capacity

Hose bed hose load allowance on the apparatus shall be 1000 lbs.

Overall Height Restriction

The apparatus shall have no overall height restrictions.

Overall Length Restriction

The unit has no overall length restrictions.

NFPA Compliance

The E-ONE supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

Equipment Capacity

Equipment allowance on the apparatus shall be 2500 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.

BUMPERS

Front Bumper

The vehicle shall be equipped with a one-piece 10” high bumper made from 10 gauge (0.135” nominal) polished stainless steel for corrosion resistance, strength, and long lasting appearance. It shall be mounted directly to the front frame extensions for maximum strength. The bumper shall incorporate two (2) stiffening ribs.

Bumper Extension

The bumper extension shall be approximately 16” from the face of the cab as required.

Bumper Gravel Shield

The extended front bumper gravel shield shall be made of 3/16” (.375”) aluminum tread plate material.

FRAME ASSEMBLY

Frame Assembly

The frame shall consist of two (2) C-channel frame rails with heavy-duty cross-members. Each frame rail shall have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame:

Dimensions: 10-1/4” x 3-1/2” x 3/8”

Material: 110,000-psi minimum yield strength, high strength, low alloy steel

Section Modulus: 16.61 cu. in.

Resistance to Bending Moment (RBM): 1,827,045 in. lbs.

If larger rails are provided, the maximum height of each frame rail shall not exceed the 10-1/4” dimension by more than 1/2” in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability.

There shall be a minimum of six (6) cross-members joining the two (2) frame rails in order to make the frame rigid and hold the rails/liners in alignment. The cross-members shall be a combination of a formed steel C-channel design along with heavy duty steel fabricated designs as required for the exact chassis configuration. The cross-members shall be attached to the frame rails with not less than four (4) bolts at each end arranged in a bolt pattern to adequately distribute the cross-member load into the rail/liner and minimize stress concentrations.

All frame fasteners shall be high-strength Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts shall be Stover locknuts to help prevent loosening. The frame fasteners shall be tightened to the proper torque at the time of assembly.

The frame rails shall be hot-dip galvanized and powder coated for improved corrosion resistance. The galvanization shall be a minimum of 4 mils thick and done in accordance with ASTM A123. The powder coat shall be 6.5 mils thick (+/- 1.5 mils) and pass ASTM D3359 testing.

The frame cross-members and frame mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) shall be painted black.

The apparatus manufacturer shall supply a full lifetime frame warranty including cross-members against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the cross-members, are not acceptable. NO EXCEPTIONS.

The custom chassis frame shall have a WHEEL ALIGNMENT in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the

manufacturer`s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request.

Frame Liner

A 9-3/8” x 3-1/8” x 3/8” channel frame liner shall be bolted to each frame rail for added strength and rigidity. Frame liners shall be made of 110,000 psi minimum yield, high strength, low alloy steel. The frame rail liners shall be hot-dip galvanized and powder coated for improved corrosion resistance. The galvanization shall be a minimum of 4 mils thick and done in accordance with ASTM A123. The powder coat shall be 6.5 mils thick (+/- 1.5 mils) and pass ASTM D3359 testing.

Each frame rail with liner shall have the following minimum characteristics:

Section Modulus: 28.74 cu. in.

RBM: 3,161,400 in. lbs.

The frame liners shall be inserted inside the open portion of the frame rails and shall run continuously from the rear of the frame to the centerline of the front axle to provide maximum frame strength at all critical load points.

Coated Fasteners

The custom chassis frame assembly shall be assembled using GEOMET 720 coated fasteners for corrosion resistance.

AXLE OPTIONS

Front Axle

The vehicle shall utilize an Meritor FL-941 front axle with a rated capacity of 20,000 lbs. It shall have ”easy steer” knuckle pin bushings and 68.5” kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 45 degrees, plus two (+ 2) degrees to minus three (- 3) degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life.

Front springs shall be parabolic tapered, minimum 4” wide x 54” long (flat), minimum 3 leaf, progressive rate with a capacity of 20,000 lbs at the ground. The springs shall have Berlin style

eyes and rubber bushings on each end with an additional standard wrap at the front eye. Tapered leaf springs provide a 20% ride improvement over standard straight spring systems.

The vehicle shall be equipped with a Sheppard model M-110 power steering gear, used in conjunction with a power assist cylinder. The steering assembly shall be rated to statically steer up to a maximum front axle load of 20,000 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

In order to achieve maximum vehicle road performance and to promote long tire life, there shall be a wheel alignment. The alignment shall conform to the manufacturer`s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery.

Shock Absorbers Front

Koni model 90 shock absorbers shall be provided for the front axle. The shocks shall be three way adjustable.

The shocks shall be covered by the manufacturer`s standard warranty.

Rear Axle

The vehicle shall utilize an Meritor RS-30-185, 31,000 lb. single rear axle with single reduction hypoid gearing and a manufacturer`s rated capacity of 31,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with Meritor oil seals.

The rear axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels to improve wheel centering and extend tire use.

SUSPENSIONS

Rear Suspension

The rear suspension shall be a Reyco model 79KB. The suspension shall include linear-rate slipper type leaf springs that eliminate spring eyes and shackles. The suspension shall also include one (1) fixed torque arm, one (1) adjustable torque arm and cast spring hangers. The suspension shall be rated for the maximum axle capacity.

WHEEL OPTIONS

Front Wheels

The vehicle shall have two (2) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Front Wheel Trim Package

The front wheels shall have stainless steel lug nut covers (for use with aluminum wheels) or chrome plated plastic (for use with steel wheels). The front axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel universal baby moons. All stainless steel baby moons shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

Rear Wheels

The vehicle shall have four (4) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Rear Wheel Trim Package, Single Axle

The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or American made chrome plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless steel high hats shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) high hats and twenty (20) lug nut covers.

TIRE OPTIONS

Front Tires

The front tires shall be two (2) Michelin 425/65R22.5 tubeless type 20 PR radial tires with XFE highway tread.

The tires with wheels shall have the following weight capacity and speed rating:

Max front rating 22,800 @ 65 mph.

Max front rating with Alco aluminum wheels - 24,400 @ 65 MPH (intermittent fire service rating if GAW is over 22,800)

The wheels and tires shall conform to the Tire and Rim Association requirements.

Rear Tires

The rear tires shall be Michelin 315/80R 22.5 tubeless type 20 PR radial tires with X Multiway 3D XZE tread.

The tires with wheels shall have the following weight capacity:

33,080 lbs. (dual) @ 75 MPH. (Intermittent fire service max load 38,904 lbs)

The wheels and tires shall conform to the Tire and Rim Association requirements.

Tire Pressure Indicators

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

BRAKE SYSTEMS

Front Brakes

The front axle shall be equipped with Meritor DiscPlus EX225H 17 inch disc brakes.

The brakes shall be covered by the manufacturer`s standard warranty which is two years, unlimited mileage and parts only.

Rear Brakes

The rear axle shall be equipped with ArvinMeritor 16-1/2” x 7” S-cam brakes with cast brake drums. Q-Plus shoes shall be provided with up to 24,000 lb. axle ratings and P-Type shoes with over 24,000 lb. axle ratings.

The rear axle brakes shall be furnished with automatic slack adjusters. ArvinMeritor brand shall be supplied on RS-24-160 and RS-25-160 axles, and Haldex brand shall be supplied on RS-26-185 and RS-30-185 axles.

A 3 year/unlimited miles parts and 3 year labor rear brake warranty shall be provided as standard by ArvinMeritor Automotive. The warranty shall include bushings, seals, and cams.

Brake System

The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.

A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.

A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.

Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver`s instrument panel.

The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

Tank Capacities in Cubic Inches:

Wet	Front	Rear	Total
1,738	1,738	1,738	5,214

Spring-actuated emergency/parking brakes shall be installed on the rear axle.

A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure.

A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver`s instrument panel shall signal a malfunction.

The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.

To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

Park Brake Release

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

Electronic Stability Control

The apparatus shall be equipped with a G4 4S4M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw - or rotational – sensing.

RSC focuses on the vehicle's center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle's deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms - engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.

To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

AIR SYSTEM OPTIONS

Air Dryer

The chassis air system shall be equipped with a Bendix-Westinghouse AD-9 air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.

Air Inlet

A 1/4” brass quick-release air inlet with a male connection shall be provided. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb.

Air Lines

Air brake lines shall be constructed of color coded nylon tubing routed in a manner to protect them from damage. Brass fittings shall be provided.

Air Horns

Dual air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the air horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

ENGINES & TRANSMISSIONS

Transmission Selector

A push-button transmission shift module, Allison model 29538373, shall be located to the right side of the steering column within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a “Do Not Shift” light and a “Service” indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

Transmission Fluid

The transmission fluid shall be TranSynd, Shell Spirax S6ATF A295, or equivalent synthetic.

Vehicle Speed

Electronic speed limiting set at 60 MPH as required by NFPA 1901.

Engine/Transmission Package

Engine

The vehicle shall utilize a Cummins L9 engine as described below:

- 450 maximum horsepower at 2100 rpm
- 1250 lb-ft peak torque at 1400 rpm
- Six (6) cylinder, charge air cooled, 4-cycle diesel
- 543 cu. in. (8.9 liter) displacement - 4.49 in bore x 5.69 in stroke
- 16.6:1 compression ratio
- Viable Geometry Turbocharged
- Engine shall be equipped with Full-Authority Electronics
- Electronic Timing Control fuel system
- Fuel cooler (when equipped with a fire pump)
- Fleetguard FS1022 fuel filter with integral water separator and water-in-fuel sensor approved by Cummins for use on the ISL engine
- Fleetguard LF9009 Venturi Combo combination full-flow/by-pass oil filter approved by Cummins for use on the ISL engine
- Engine lubrication system, including filter, shall have a minimum capacity of 25 quarts
- Delco-Remy 39 MT-HD 12-volt starter
- Cummins 18.7 cubic foot per minute (cfm) air compressor
- Corrosion inhibitor additive for coolant system

- After treatment system consisting of a oxidation catalyst and diesel particulate filter and selective catalyist reduction system
- Ember separator compliant with current NFPA 1901 standard
- The engine shall be compliant with 2017 EPA Emission standards

The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. The intake piping clamps shall be heavy-duty, constant-torque, T-bolt style to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The air cleaner shall be an 11” diameter K&N for lower restriction and high air flow. The filtration media shall be washable and easily accessed for service. The air filter shall have a 3 year / 300,000 mile warranty.

The engine exhaust piping shall be a minimum of 4” diameter welded stainless steel tubing. The aftertreatment system shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000-miles parts and labor warranty shall be provided as standard by Cummins.

A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of ”power-down” feature to meet engine installation tests.

Transmission

The vehicle shall utilize an Allison EVS3000P, electronic, 5-speed automatic transmission.

A push button shift module shall be located right side of the steering column, within easy reach of the driver. The shift position indicator shall be indirectly lit for after-dark operation. The shift module shall have a ”Do Not Shift” light and a ”Service” indicator light that are clearly visible to the driver. The shift module shall have means to enter a diagnostic mode and display diagnostic data.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of 1250 lb.-ft. and a gross input power rating of 450 HP.

The gear ratios shall be as follows:

1 - 3.49

2 - 1.86

3 - 1.41

4 - 1.00

5 - .75

R - 5.03

The transmission shall have an oil capacity of 23 quarts and shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the driver.

A water-to-oil transmission oil cooler shall be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow). Air-to-oil transmission oil coolers, which require constant air flow, are not acceptable.

The transmission shall be provided with two (2) engine-driven PTO openings located at the 4 o`clock and 8 o`clock positions for flexibility in installing pto-driven equipment.

The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of the transmission when the engine speed is decreased during pump operations, thereby maintaining a constant gear ratio for safe operation of the pump. The transmission lock-up shall be automatically activated when the pump is engaged in gear. The transmission lock-up shall be automatically deactivated when the pump is disengaged for normal road operation.

A 5-year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

Automatic Shift to Nuetral

The transmission shall be programmed to comply with NFPA 1901 and automatically shift to neutral upon application of the parking brake.

SECONDARY BRAKING

Jacobs Engine Brake

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab accessible to the driver.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the “on” position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the “off” position, the engine brake shall immediately release and allow the engine to return to its normal function.

Transmission Programming

The transmission shall include the Allison 2nd gear Pre-Select feature. This option will direct the transmission to down shift to second gear when the throttle is released and the Jacobs engine brake (or Telma retarder wired to activate with release of throttle) is engaged. This feature is designed to increase brake life and aid vehicle braking.

COOLING PACKAGE

Engine Cooling Package

Radiator

The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment.

Silicone Hoses

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

Coolant

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe winter temperatures.

Coolant Recovery

There shall be a coolant overflow recovery system provided.

Charge Air Cooler System

The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance.

Charge Air Cooler Hoses

Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

Fan/Shroud

The fan shall be 30” in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling.

Transmission Cooler

The cooling system shall include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler shall have an increased capacity to handle the additional heat load.

FUEL SYSTEMS

Fuel System

One (1) 50 gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Federal Highway Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with grade 8 hardware. This design allows for tank removal from below the chassis.

The fuel tank shall be equipped with a 2” diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain.

The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent splash-back during fueling operations. A .50” NPT drain plug shall be provided at the bottom of the tank.

The tank shall have a minimum useable capacity of 50 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A mechanical fuel pump shall be provided and sized by the engine manufacturer as part of the engine.

Fuel Line

All fuel lines shall be rubber.

ALTERNATOR

320 Amp Alternator

There shall be a 320 amp Leece Neville alternator installed as specified. The alternator shall be a Leece Neville 4890JB series brushless type with integral rectifier and adjustable voltage regulator with an output of 272 amps per NFPA 1901 rating (320 amps per SAE J56).

BATTERIES

Battery System

The manufacturer shall supply four (4) heavy duty Group 31 12-volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. Each battery box shall hold (2) batteries. The batteries shall have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, each containing (2) batteries. Each battery tray shall be equipped with a rubber vent hose to facilitate drainage. The rubber vent hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provided.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

CHASSIS OPTIONS

Engine Fan Clutch

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and / or the water pump is engaged (if equipped).

When disengaged, the fan clutch shall allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy.

The fan shall be equipped with a fail-safe engagement so that if the clutch fails the fan shall engage to prevent engine overheating.

Drivelines

Drivelines shall have a heavy duty metal tube and shall be equipped with Spicer 1710HD universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

Rear Tow Eyes

Two (2) heavy duty tow eyes made of 3/4” (0.75”) thick steel having 2.5” diameter holes shall be bolted directly to the rear of the frame to allow towing (not lifting) of the apparatus. The tow eyes shall be protruding into the rear compartment or out the rear of the body. The tow eyes shall be painted chassis black.

Front Tow Hooks

Two (2) heavy duty painted front tow hooks shall be securely bolted to the front chassis frame rail extensions to allow towing (not lifting) of the apparatus without damage. They shall be mounted in the downward position.

Hydraulic Pump System

A fixed-displacement hydraulic pump system shall be provided to operate all outrigger and aerial functions as well as the chassis power steering system. This shared hydraulic system is desired because it heats the hydraulic fluid while driving to provide smoother operation to other systems in cold climate conditions, rather than utilizing a separate pump.

The hydraulic pump system shall allow the aerial system to be activated without having to shut down the water pump or reduce engine RPM`s by a switch located on the cab within easy reach of the driver. A system ”engaged” indicator light shall be provided on the activation switch.

Engagement of the aerial circuit shall only be allowed with the transmission in the neutral or pump gear and the parking brake engaged.

The system's hydraulic pump shall be engine mounted and able to supply thirteen (13) gpm of hydraulic fluid at a maximum pressure of 3,000 psi. The hydraulic system shall normally operate between 1,000 and 2,500 psi. It shall have flow controls to protect hydraulic components and it shall incorporate a relief valve set at 2,800 psi to prevent over-pressurization (2950 on HP78 models).

DEF Tank

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided.

The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender shall be provided in the DEF tank connected to a level gauge on the cab dash.

The tank shall be located R1 floor offset forward.

CAB MODEL

Cab Typhoon Medium

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16” (0.188”) 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal ”roll-cage” effect by welding two (2) 3” x 3” x 0.188” wall-thickness 6063-T5 aluminum upright extrusions between the 3” x 3” x 0.375” wall-thickness 6061-T6 roof crossbeam and the 2.25” x 3” x 0.435” wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter

extrusion and the subframe structure in the rear to complete the interlocking framework. The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side 3” x 1.5” .375 thick C-channel extrusion across the front, with 3/4” x 2-3/4” (.75” x 2.75”) full-width crossmember tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16” (0.188”) 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable.

The cab roof perimeter shall be constructed from 4” x 6-5/8” (4” x 6.625”) 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.

The cab rear skin shall be constructed from 3/16” (0.188”) 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall.

The left-hand and right-hand cab side skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9” outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact.

Cab Exterior

The exterior of the cab shall be 94” wide x 130” long to allow sufficient room in the occupant compartment for up to eight (8) fire fighters. The cab roof shall be approximately 101” above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 58”.

Front axle fenderette trim shall be brushed aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16” (0.188”) composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

A large stainless steel cooling air intake grille with an open area of no less than 81% shall be at the front of the cab.

The cab windshield shall be of a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4” (0.25”) thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,561-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver`s seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

Windshield Wipers

Two (2) opposed radial style windshield wipers with two (2) separate electric motors shall be provided for positive operation. The wipers shall be tested beyond the minimum SAE requirement to a total of 3.3 million cycles. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 20”, and the blade length approximately 21”. Each arm shall have a 90 degree sweep for full coverage of the windshield. The wipers shall be synchronized so as to wipe each windshield simultaneously.

Cab Mounts and Cab Tilt System

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided to provide easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking break is set.

The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A ”cab ajar” indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

Cab Interior

The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23” from the floor at each side and 27” in the center section. The engine cover shall not exceed 41” in width at its widest point.

The rear portion of the forward engine cover shall be provided with a lift-up door to provide easy access for checking and filling engine oil, transmission fluid and power steering fluid without raising the cab (a separate access panel shall be provided for the power steering when equipped with an X12 or X15 engine).

The engine cover insulation shall consist of 1/2” closed cell elastomeric compound foam with aluminum foil faced fiberglass fabric manufactured to specifically fit the engine cover. All edges and seams shall be sealed using aluminum foil faced fiberglass tape. The insulation shall meet or exceed DOT standard FMVSS 302-1 and V-0 (UI subject 94 Test).

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current NFPA 1901.

The rear engine cover area shall be covered with molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black with a pebble grain finish for slip resistance.

A minimum of 57.25” of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25” floor-to-ceiling height shall be provided in the rear seating area. A minimum of 36” of seated headroom at the "H" point shall be provided over each fenderwell.

The interior side to side dimensions shall be 87" from wall padding to wall padding and 89.5" from door to door.

The floor area in front of the front seat pedestals shall be no less than 24" side to side by up to 25” front to rear for the driver and no less than 24" side to side by up to 27” front to rear for the officer to provide adequate legroom.

Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4” (0.25”) foam padding. The padding board shall be backed with 1/4” (0.25”) thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18” padded steering wheel with a center horn button shall be provided.

The driver and officer seat risers shall be welded to the main cab floor structure. Depending on the make and model of the seats, a storage compartment with a hinged door shall be provided in the risers.

The lower front cab steps shall be a minimum of 11.5” deep x 24” wide. The lower rear cab steps shall be a minimum 16” deep x 21” wide. The first step at the front and rear cab doors shall be no more than 24.0” above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The front and rear steps shall incorporate full width intermediate steps for easy access to the cab interior. The intermediate step at the front doors shall be approximately 6" deep (minimum). The intermediate step at the rear doors shall be approximately 10.75" deep (minimum). The step surfaces shall be aluminum diamond plate with a multi-directional,

aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

A black grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black grip handle shall be provided on the left and right side windshield post for additional handholds.

Cab Doors

Four (4) side-opening cab doors shall be provided. Doors shall be constructed of a 3/16” (0.188”) aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 36” wide x 72.5” high, and the rear cab door openings shall be approximately 33.75” wide x 72.5” high. The front doors shall open approximately 85 degrees, and the rear doors shall open approximately 80 degrees.

The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8” (0.375”) diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors.

The front door windows shall provide a minimum viewing area of 518 sq. in. each. The rear door windows shall provide a minimum viewing area of 554 sq. in. each. All windows shall have 75% light transmittance automotive safety tint.

The door handles on the exterior of the cab shall be a pull type with vertical orientation. The handles shall be made with corrosion free material and have a black finish. Each exterior door handle shall have an integral keyed lock.

Recessed paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901. The rear cab door handles shall have a vertical orientation making them easily accessible from forward or rearward outboard seating positions. Each cab door shall have a manually operated door lock actuated from the interior of each respective door.

Cab Instruments and Controls

Cab controls shall be located on the cab instrument panel in the dashboard on the driver`s side where they are clearly visible and easily reachable. Chassis operation switches shall be installed in removable panels for ease of service. The following gauges and/or controls shall be provided:

• Speedometer/Odometer
• Tachometer
• Engine hour meter
• Engine oil pressure gauge with warning light and buzzer
• Engine water temperature gauge with warning light and buzzer
• Transmission oil temperature gauge
• Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
• Fuel gauge with low fuel indicator light
• Voltmeter
• Master battery/ignition switch (rocker with integral guard)
• Engine start switch (rocker)
• Heater and defroster controls with illumination
• Marker light/headlight control switch (rocker)
• Panel light dimmer switch (rocker)
• Self-canceling turn signal control with indicators
• Windshield wiper switch with variable speed and washer controls
• Pump shift control with green ”pump in gear” and ”o.k. to pump” indicator lights
• Parking brake controls with red indicator light on dash
• Automatic transmission shift console
• Electric horn button at center of steering wheel
• Master warning light switch
• Cab ajar warning indicator
• Air filter restriction indicator

Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

Electrical System

The cab and chassis system shall have designated electrical distribution areas. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An access cover shall be provided for maintenance access to the electrical distribution area. Circuit protection shall be provided by fuses, thermal reset breakers and / or solid state controls.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

Daytime Running Lights

Two (2) dual rectangular chrome plated headlight bezels shall be installed on the front of the cab. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation.

Fast Idle System

A fast idle system shall be provided and controlled by a switch accessible by the driver. The system shall increase engine idle speed to a preset RPM for increased alternator output.

Cab Crashworthiness Requirement

The apparatus cab shall meet and/or exceed relevant NFPA 1901 load and impact tests required for compliance certification with the following:

Side Impact Dynamic Pre-Load per SAE J2422 (Section 5).

Testing shall meet and/or exceed defined test using 13,000 ft-lbs of force as a requirement. The cab shall be subject to a side impact representing the force seen in a roll-over. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 13,776 ft-lbs of force **exceeding** testing requirements.

Quasi-static Roof Strength (proof loads) per SAE J2422 (Section 6) / ECE R29, Annex 3, paragraph 5.

Testing shall meet and/or exceed defined test using 22,046 lbs of mass as a requirement. Testing shall be completed using platen(s) distributed uniformly over all bearing members of the cab roof structure.

Cab testing shall be completed using 23,561 lbs of mass **exceeding** testing requirements. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space and doors shall remain closed.

Additional cab testing shall be conducted using 117,336 lbs of mass **exceeding** testing requirements by **over five (5) times**. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space and the doors shall remain closed.

Frontal Impact per SAE J2420.

Testing shall meet and/or exceed defined test using 32,549 ft-lbs of force as a requirement. The cab shall be subject to a frontal impact as defined by the standard. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 34,844 ft-lbs of force **exceeding** testing requirements.

Additional cab testing shall be conducted using 65,891 ft-lbs of force **exceeding** testing requirements by **over two (2) times**.

The cab shall meet all requirements to the above cab crash worthiness; **NO EXCEPTIONS**.

A copy of a certificate or letter verifying compliance to the above performance by an independent, licensed, professional engineer shall be provided upon request.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

Seat Mounting Strength

The cab seat mounting surfaces shall be third party tested and in compliance with FMVSS 571.207.

Seat Belt Anchor Strength

The cab seat belt mounting points shall be third party tested and in compliance with FMVSS 571.210.

ISO Compliance

The manufacturer shall ensure that the construction of the apparatus cab shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer`s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus cab that is built to exacting standards, meets the customer`s expectations, and satisfies the customer`s requirements.

CAB ROOF TYPE

Cab Roof

The cab shall have a flat roof (non-vista).

CAB BADGE PACKAGE

Logo Package

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

CAB DOOR OPTIONS

Rear Cab Door Position

The cab rear doors shall be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress by reducing the rear facing seat protrusion into the door opening.

Rear door position to the 58” or (medium cab).

Cab Door Locks

The cab shall have CH751 keyed door locks provided on exterior doors to secure the apparatus.

Cab Door Panels

The inner door panels shall be made from 1/8" (.125") aluminum plate painted Zolatone (to match cab interior paint) for increased durability. The cab door panels shall be split just below the the handrail and incorporate an easily removable panel for access to the latching mechanism and window regulator for maintenance or service.

Cab Door Reflective Material

Reflective Red/Lemon Yellow material striping shall be provided approximately 12" high on the lower cab door panels. The stripes shall run from the top outer corner to the bottom inside corner of the lower door area, forming a "A" shape when viewed from the rear. The reflective material shall meet NFPA 1901 requirements.

Cab Door Locks

Each cab door shall have a manually operated door lock actuated from the interior of each respective door. Exterior of each cab door shall be provided with a keyed lock integrated with the cab door handle.

Cab Front Door Windows

Full roll-down windows shall be provided for the front cab doors with manually operated worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

Cab Rear Door Windows

Full roll-down windows shall be provided for the rear crew doors with manually operated worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

Cab Door Style

The cab doors shall be barrier style with exposed lower steps.

CAB STEP OPTIONS

Cab Steps

The lower cab steps shall extend 3.5" past the side of the cab to provide increased surface area.

MIRRORS

Cab Mirrors

Two (2) Ramco model 6001MCR remote controlled polished aluminum mirrors shall be installed. The mirrors shall incorporate a top main section with a manually adjustable convex lower mirror. The adjustment of main sections shall be through dash switches. Location: mounted on front corners of cab.

MISC EXTERIOR CAB OPTIONS

Cab Canopy Window

There shall be a fixed window provided between the front and rear doors on the driver`s side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
- 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H

Cab Canopy Window

There shall be a fixed window provided between the front and rear doors on the officer`s side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
- 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mud flaps shall be installed on the rear of the cab front wheel wells. The design of the mud flaps shall have corrugated ridges to distribute water evenly.

Handrails

Cab door assist handrails shall consist of two (2) 1.25” diameter x 18” long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2” from the mounting surface to allow a positive grip with a gloved hand.

Handrails

Cab door assist handrails shall consist of two (2) 1.25” diameter x 18” long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer rear door openings each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2” from the mounting surface to allow a positive grip with a gloved hand.

Rear Cab Wall Construction

The rear cab wall shall be constructed with the use of 3/16" aluminum diamond plate interlocking in aluminum extrusions.

Cab Wheel Well

The cab wheel well shall be increased in size to provide additional clearance for larger tires. The fender trim shall be adjustable in and out to better accommodate various wheel / tire offsets.

Receptacle Mounting Plate

A mounting plate shall be provided for the battery charger receptacle, battery charger indicator and if applicable the air inlet, etc. The plate shall be constructed of 14 gauge brushed finish stainless steel and be removable for service access to the receptacle(s) and indicator.

HVAC

HVAC Control Location

Heating and air conditioning controls shall be located in the driver side lower dash area.

Air Conditioning

An overhead air-conditioner / heater system with a single radiator mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid-cab position, away from all seating positions. The unit shall provide fourteen (14) comfort discharge louvers, eight (8) to the back area of the cab, six (6) to the front area of the cab including one (1) each side outboard in the forward overhead console. These louvers will be used for both AC and heated air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery. For improved corrosion resistance the evaporator shall have a hydrophilic blue fin coating.

The control panel shall actuate the air-distribution system using electric actuators. The control panel shall allow blended airflow to both the comfort air vents and defrost vents. Separate three-speed blower switches shall be provided to independently control air speed for the front and rear blowers.

The condenser shall be radiator mounted and have a minimum capacity of 65,000 BTUs and shall include a receiver drier.

Performance Data: (Unit only, no ducting or louvers)
• AC BTU: 55,000
• Heat BTU: 65,000
• CFM: 1300 @ 13.8V (All blowers)

The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu. in. per revolution.

The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

SEATS

Seating

All seats shall be Seats, Inc. 911 brand.

Seat, Driver

Seats, Inc. 911 air suspension seat shall be supplied for the driver`s position.

Features shall include:

- Universal styling
- High back seat back
- Low profile air suspension assembly with rubber accordion cover
- Weight, height and ride adjustment
- Built-in back and lumbar adjustment
- 4” fore and aft adjustment

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Officer

One (1) Seats, Inc. 911 Universal fixed SCBA seat shall be supplied for the officer`s position in front of the cab to the right of the driver`s position.

Features shall include:

- Universal styling.
- High back seat back.
- Built-in back and lumbar adjustment.
- Easy exit, flip up, and split headrest for improved exit with SCBA.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Rear Facing

One (1) Seats, Inc. 911 Universal SCBA seat shall be provided in the rear facing position over the driver side wheel well.

Features shall include:

- Universal styling.
- High back seat back.
- Easy exit, flip up, and split headrest for improved exit with SCBA.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat, Rear Facing

One (1) Seats, Inc. 911 Universal SCBA seat shall be provided in the rear facing position over the officer side wheel well.

Features shall include:

- Universal styling.
- High back seat back.
- Easy exit, flip up, and split headrest for improved exit with SCBA.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat Fabric Color

All seats shall be gray in color.

Seating Capacity Tag

A tag that is in view of the driver stating seating capacity of four (4) personnel shall be provided.

Universal Bracket for Air Pack Bottles

A Ziamatic bottle bracket model KD-ULLH consisting of a back plate, short footplate, two non-mar double-coated clips and a ”Load & Lock” adjustable strap assembly shall be provided. The back plate and footplate will be black thermo-plastic coated. The clips will be double coated as to not mar cylinders. The bracket shall fit all U.S. made 30 to 60 minute rated self-contained breathing apparatus.

Brackets shall be located officer's seat, rear facing driver's side, rear facing officer's side.

Seat Cover Material

All seats shall have Turnout Tuff seat cover material.

MISC INTERIOR CAB OPTIONS

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

Sun Visors

Lexan sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

Engine Cover

The engine cover shall blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides shall have a sloped transition surface running front to rear providing increased space for the driver and officer.

The engine cover and engine service access door cover shall be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black and feature a pebble grain finish for slip resistance.

Overhead Console

An overhead console shall be provided in the front of the cab for the driver and officer. The areas in front of the driver and officer shall be removable panels that can be used for switches and other electrical items. The entire overhead console shall be hinged for service access.

The center of the overhead console shall have a lowered area for mounting of up to three (3) electrical components like siren heads, directional bar controllers, etc.

The overhead console shall be constructed of aluminum smooth plate painted to match the cab interior. The console shall be installed using stainless steel fasteners.

Rear Engine Cover

The rear engine cover shall be provided with a reduced profile for increased legroom on the forward facing rear inboard seats.

Cab Dash - Low Profile Severe Duty

The driver side and center dash shall be constructed from cast aluminum for durability and long life.

The driver side cast aluminum dash shall enclose the instrument cluster.

The center dash area shall be a low profile design to provide optimal forward visibility. The driver and officer sides shall be angled for ergonomic access and designed for either a color display or switches. Access panels shall be provided on the top, front and officer side for easy service access.

The officer side dash shall be low profile and constructed from .125" smooth aluminum plate. A service access panel shall be provided in the top surface.

The driver, center and officer side dash shall be painted to match the cab interior.

The lower kick panels below the dash to be constructed from .125 aluminum plate painted to match the cab interior. The panels shall be removable to allow for servicing components that may be located behind the panels.

Cab Insulation Package

The cab shall be insulated to mitigate noise and ensure maximum cooling/heating capacity. The insulation package shall include 1" Polyester foam with Mylar facing for the front wall, rear wall, side walls, and ceiling, Reflectex (or equal) inside each cab door and 1" closed cell foam insulation below the front and rear facing seat risers.

CAB ELECTRICAL OPTIONS

Cab Dome Lights

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing shall be installed. The white light activates with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

Battery Charger Receptacle

A 20 amp battery charger receptacle shall be installed in the specified location.

The receptacle shall be located outside driver's door next to handrail.

The cover color shall be Yellow.

ATC Override

An Automatic Traction Control (ATC) override switch shall be provided. The switch shall be located within reach of the driver and allow for momentary disabling of the ATC system due to mud or snow conditions.

English Dominant Gauge Cluster

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and night time operations.

Headlights

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the lower position. The headlights shall be day time operational.

Cab Turn Signals

There shall be a pair of Federal Signal QuadraFlare model QL64Z-ARROW LED (Light Emitting Diode) turn signal light heads with populated arrow pattern and amber lens mounted upper headlight bezel and wired with weatherproof connectors.

Battery Charger Location

The battery charger shall be located behind driver's seat.

Battery Charger

An E-ONE LPC 20 battery charger with remote mounted LED display shall be installed.

A fully automatic charging system shall be installed on the apparatus. The system shall have a 120 volt, 60 hertz, 7 amp AC input with an output of 20 amps 12 volts DC. The battery charging system shall be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system shall include a remote charging status indicator panel. The panel shall consist of two (2) LED lights to provide a visual signal if battery voltage is good or drops below 11.5 volts. The microprocessor shall be continuously powered from the battery to provide the charge status.

DPF Regeneration Override

A momentary override switch shall be provided for the Diesel Particulate Filter (DPF) regeneration. The switch will inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch shall be located within reach of the driver.

Cab Headlights

FireTech model FT-4x6-4KIT LED headlights shall be provided. Headlights shall include low beam, high beam, elliptical beam and an integrated halo ring park lamp.

Hourmeter

The vehicle shall be equipped with an aerial PTO hourmeter mounted in the cab to comply with NFPA1901 section 19.19.8.

Daytime Running Lights

A pair of TecNiq LED (Light Emitting Diode) daytime running lights with clear lenses shall be installed on the front of the cab. The strip type lights shall be 1.25" high x 15" long and be mounted in a polished cast aluminum housing between the quad bezels. The lights shall be programed to switch off when the park brake is applied.

Cab Door Step Area Lighting

There shall be eight (8) clear TecNiq model D07 LED lights provided to illuminate the cab step well areas. Two (2) lights shall be located at each door area, one (1) above each step. The lights shall have polished stainless steel housings. The lights shall be activated by the cab door ajar circuit.

BODY MODEL

Aerial Body

Performance

The body design shall have a rescue configuration on both sides with 26” deep lower compartments and 12” deep upper compartments to provide 146.26 cubic feet of enclosed storage. The cubic footage calculation shall not include ladder tunnels or hosebed. The minimum water tank size to be considered acceptable shall be 500 gallons.

The body design shall accommodate a 115` of ground ladder storage and a 500 gallon water tank without a reduction in water tank capacity or the addition of a tandem axle. A single rear axle is required for maximum compartment space and vehicle maneuverability.

The body design shall be modular to permit easy repair and remount. An extruded aluminum body is required to provide a strong corrosion-resistant vehicle.

Aluminum Construction

The apparatus body shall be constructed entirely of aluminum plate and extrusions. The framework, formed from beveled 6063T5 and 6061T6 alloy extrusions, shall be electrically seam welded both internally and externally at each joint using 5356 aluminum alloy welding wire. The entire exterior body shall be completely sanded and deburred to assure a smooth finish prior to painting. All horizontal surfaces, rear steps, running boards, walkways and the rear body surface will be constructed from aluminum treadplate.

Body Mainframe

The entire vehicle shall be constructed of aluminum extrusions. Body designs that incorporate steel sub-frames connected to aluminum compartments are not as corrosion-resistant and not acceptable.

Frame cross-member extrusions shall be at the front of the body and ahead of the rear wheel well. The extrusions shall be 3” x 3” 6061T6 aluminum with 3/8” wall thickness. A solid 3” x 3” ”I” section aluminum extrusion shall be provided full width over the rear wheel well. The cross-members shall be designed to support the compartment framing and shall be welded to a 1-3/16” x 3” solid 6063T5 aluminum frame sill extrusion. The frame sill extrusion shall be shaped to contour with the chassis frame rails and shall be protected from contact with the chassis frame rails with 5/16” x 2” fiber-reinforced rubber strips.

Body Mounting System

The body shall attach to the chassis frame rails with series of 5/8” thick threaded U-bolts. The rear of the body shall be spring mounted to allow for chassis flex. This attachment system shall allow easy removal of the body for major repair or disassembly. Body designs that weld to the aerial torque box or chassis frame rails shall not be acceptable due to the stress imposed on the vehicle during road travel and aerial operations.

Water Tank Mounting System

The water tank shall be mounted on an extruded aluminum framework. The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity, the water tank bottom shall be mounted within 5” of the frame rail top. Designs that store ground ladders under the water tank and raise center of gravity shall not be acceptable.

The body design shall allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. An extruded aluminum cradle covered with rubber shock pads and corner braces shall support the tank.

Stabilizer Openings

Directly behind the rear wheel well opening on each side shall be body openings for aerial stabilizers. The openings shall be framed in aluminum extrusions and fitted with removable panels for service access to the backside of the stabilizer extension rods.

Rear Aerial Access Staircase

A single 38” wide staircase shall be supplied on the rear of the apparatus for access to the aerial turntable. The angled staircase shall be supplied with extruded aluminum handrails on both sides of the staircase frame

Access steps shall be mounted in accordance with current NFPA requirements, and shall not exceed a maximum stepping height of 18”. The top surface of the step shall have a minimum of 35 sq. in. and shall have an aggressive multi-directional, slip-resistant surface. Access steps shall be able to support up to 500 pounds. Steps shall be located to provide a minimum of 8” clearance between the leading edge of the step and any obstruction.

Rear Body Design

A rear tailboard shall be manufactured of 3/16” aluminum treadplate and reinforced with 1 1/2” x 3” aluminum extrusions for strength. The tailboard shall be a bolt-on design for easy repair. A multi-directional aggressive grip surface with drainage capability shall be supplied below the fuel fill area.

Fuel Fill Location

The fuel fill shall be located at the rear of the apparatus next to the waterway inlet. The fuel fill door shall be labeled ”Diesel Fuel Only”

Body Top

Removable embossed diamond plate around the aerial turntable shall be supplied for service access to the aerial hydraulic oil reservoir.

Fire Hose Storage

A storage area for fire hose shall be located over the center of the apparatus body under the aerial device. The hosebed shall be approximately 84” long x 70” wide x 18” deep and contain 56 cubic feet of storage.

The hosebed sides shall consist of 3/16” aluminum welded from the backside into a framework of 3” x 3” x 3/16” and 1 1/2” x 4” x 3/16” 6063T5 aluminum slotted extrusions. The extrusions shall be welded both vertically and horizontally for high rigidity.

The hosebed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum. Extrusions shall have an anodized radiused ribbed top surface for maintenance-free service life. Extruded aluminum slats shall be approximately 3/4" x 7 1/2" and shall be riveted into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose. The hosebed compartment shall be free of sharp edges and projections to prevent hose damage. The compartment deck design shall incorporate a provision for the installation of adjustable hosebed dividers.

The hosebed shall continue back around the turntable with a hosebed deck on the left and right of the turntable. Each area shall be approximately 13" wide x 10" deep with extruded aluminum hosebed decking slats.

Compartments

All body compartment walls and ceilings shall be constructed from 1/8" formed aluminum 3003 H14 alloy plate. Each compartment shall be modular in design and shall not be part of the body support structure.

Compartment floors shall be constructed of 1/8" aluminum diamond plate welded in place. Compartment floors that are over 15" deep shall be supported by a minimum 1.5" x 3" x 1/8" walled aluminum extrusions. The compartment seams shall be sealed using a permanent pliable silicone caulk. A series of louvers shall be supplied to facilitate ventilation of each compartment. Each louver shall be 3" wide by 3/4" tall and 1/2" deep. External compartment tops shall be constructed of 1/8" embossed aluminum diamond plate.

Compartment Sizes

The approximate compartment sizes and locations shall be as follows:

Left Side:
There shall be one (1) compartment (L1) behind the pump module. The compartment shall be approximately 24" wide x 31" high x 12" deep (upper), 24" wide x 4" high x 9" deep (middle) and 24" wide x 26" high x 26" deep (lower) and contain approximately 15.06 cubic feet of storage space. The door opening shall be approximately 24" wide x 61" high.

There shall be one (1) compartment (L2) forward of the rear wheels. The compartment shall be approximately 34" wide x 31" high x 12" deep (upper), 34" wide x 4" high x 9" deep (middle) and 34" wide x 26" high x 26" deep (lower) and contain approximately 21.33 cubic feet of storage space. The door opening shall be approximately 34" wide x 61" high.

There shall be one (1) compartment (L3) over the rear wheels. The compartment shall be approximately 40.5" wide x 31" high x 12" deep and contain approximately 8.72 cubic feet of storage space. The door opening shall be approximately 40.5" wide x 31" high.

There shall be one (1) compartment (L4) over the rear stabilizer. The compartment shall be approximately 40.5” wide x 31” high x 12” deep and contain approximately 8.72 cubic feet of storage space. The door opening shall be approximately 40.5” wide x 31” high.

There shall be one (1) compartment (L5) behind the rear stabilizer. The compartment shall be approximately 32” wide x 31” high x 12” deep (upper), 32” wide x 4” high x 9” deep (middle) and 30” wide x 26” high x 26” deep (lower) contain approximately 19.3 cubic feet of storage space. The door opening shall be approximately 32” wide x 61” high.

Right Side:
There shall be one (1) compartment (R1) behind the pump module. The compartment shall be approximately 24” wide x 31” high x 12” deep (upper), 24” wide x 4” high x 9” deep (middle) and 24” wide x 26” high x 26” deep (lower) and contain approximately 15.06 cubic feet of storage space. The door opening shall be approximately 24” wide x 61” high.

There shall be one (1) compartment (R2) forward of the rear wheels. The compartment shall be approximately 34” wide x 31” high x 12” deep (upper), 34” wide x 4” high x 9” deep (middle) and 34” wide x 26” high x 26” deep (lower) and contain approximately 21.33 cubic feet of storage space. The door opening shall be approximately 34” wide x 61” high.

There shall be one (1) compartment (R3) over the rear wheels. The compartment shall be approximately 40.5” wide x 31” high x 12” deep and contain approximately 8.72 cubic feet of storage space. The door opening shall be approximately 40.5” wide x 31” high.

There shall be one (1) compartment (R4) over the rear stabilizer. The compartment shall be approximately 40.5” wide x 31” high x 12” deep and contain approximately 8.72 cubic feet of storage space. The door opening shall be approximately 40.5” wide x 31” high.

There shall be one (1) compartment (R5) behind the rear stabilizer. The compartment shall be approximately 32” wide x 31” high x 12” deep (upper), 32” wide x 4” high x 9” deep (middle) and 30” wide x 26” high x 26” deep (lower) contain approximately 19.3 cubic feet of storage space. The door opening shall be approximately 32” wide x 61” high.

Pump Module

The apparatus body shall be divided into two (2) individual sections. The pump compartment shall be a separate module from the apparatus body and hosebed compartmentation. This will allow each module to move independently of the other. The pump compartment module shall extend full width of the body.

The pump operator`s control panel and pump compartment shall be located at the front of the body. The operator`s controls and gauges shall be located on the left side (street side) of the apparatus. The compartment shall be designed following NFPA 1901 15.6.

The left and right side pump panels shall be completely removable for easy access to the pump compartment. Each panel shall be split approximately two-thirds of the way from the bottom by an anodized extrusion, which shall allow removal of the left side upper panel for easy access to gauges.

A side running board formed from1/8” aluminum diamond plate shall be provided and shall extend the full length of the pump module on each side of the apparatus. The running board shall be bolted to the pump compartment for rigidity and to provide easy removal for replacement in the case of damage.

Handrails

Access handrails shall be provided at all step positions, including, but not limited to, the rear tailboard. All body handrails shall be constructed of maintenance-free, corrosion-resistant, extruded aluminum. Handrails shall be a minimum of 1.25” OD and shall be installed between chrome end stanchions at least 2” from the mounting surface to allow for access with a gloved hand. The extruded aluminum shall be ribbed to assure a good grip for personnel safety.

The handrails shall be installed as follows:

• Two (2) 48” handrails, one (1) each side, located on the aerial access stair case

Steps, Standing, and Walking Surfaces

The maximum stepping distance shall not exceed 18”, with the exception of the ground to first step. The ground to first step shall not exceed 24”. The ground to first step shall be maintained when the stabilizers are deployed by an auxiliary set of steps installed at the aerial access staircase. All steps or ladders shall sustain a minimum static load of 500 lbs. without deformation as outlined in NFPA 15.7.2.

All exterior steps shall be designed with a minimum slip resistance of 0.52 when tested wet using the Brungraber Mark II tester in accordance with the manufacturer's instructions.

Apparatus Warning Labels

A label shall be supplied on the rear body to warn personnel that riding in or on the rear step is prohibited as outlined in NFPA 1901 15.7.5. A label shall be applied to both sides of the apparatus and the rear to warn operators that the aerial is not insulated.

Rubrail

The body shall have a rubrail along the length of the body on each side and at the rear. The rubrail shall be constructed of minimum 3/16” thick anodized aluminum 6463T6 extrusion. The rubrail shall be a minimum of 2.75” high x 1.25” deep and shall extend beyond the body width to protect compartment doors and the body side.

The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a minimum of five (5) serrations raised .1” high with cross grooves to provide a slip-resistant edge for the rear step and running boards. The rubrail shall be spaced away from the body using 3/16” nylon spacers. The ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a reflective material for increased side and rear visibility.

ISO Compliance

The manufacturer shall ensure that the construction of the apparatus aerial body shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer`s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus aerial device that is built to exacting standards, meets the customer`s expectations, and satisfies the customer`s requirements.

BODY COMPT REAR

Rear Body Platework

The rear body platework shall be smooth un-painted aluminum plate to facilitate rear body striping.

AERIAL BODY OPTIONS

Double Crosslay Hosebed

Two (2) crosslay hosebeds shall be provided at the front area of the body. Each of the two (2) crosslay sections shall have a capacity for up to 200` of 2.0” double-jacket fire hose double stacked and preconnected to the pump discharge. The crosslay decking shall be constructed entirely of maintenance-free 3/4” x 2-3/4” hollow aluminum extrusions.

Stainless steel rollers with nylon guides set in aluminum extrusions shall be installed horizontally and vertically on each end of the crosslay to allow easy deployment of the hose and help protect the body paint.

Dunnage Pan

A dunnage pan constructed of 3/16” (.188”) aluminum treadplate shall be located rearward of the crosslays. The dunnage pan shall be sized to maximize available storage space.

Outrigger Covers

Two (2) piece outrigger covers constructed of .125`` aluminum tread plate shall be provided for the jack leg openings. One piece of the cover shall be sized to cover just the extending outrigger in order to require a minimal amount of set-up space. The second piece of the cover shall be fixed and mounted to the body to cover the remaining outrigger opening.

Rear Pike Pole Storage

Pike poles storage shall be provided at the rear of the body for six (6) pike poles. The storage area shall be labeled for two (2) 6` poles, two (2) 8` poles, and two (2) 12` poles. The pike poles shall be secured by either ”J” slotted locking tubes and/or hinged door(s) that matches the rear body finish.

Ladder Tunnel Doors

A pair of 1/8” (.125) aluminum diamond plate doors with D-ring style handles shall be installed for access to the rear ladder tunnel. Each door shall open a full 90 degrees to allow easy removal of ground ladders.

Auxiliary Ground Pads

Two (2) auxiliary ground pads shall be provided. The pads shall be 24” x 24” x 1/2” thick aluminum plate with a 20 degree formed handle with cutout for hand hold. The pads shall be stored in brackets that are welded below the body.

DOORS

Single Compartment Door

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 3/32" (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1” x 9/16” (1” x 0.43”) closed-cell ”P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have a gas shock-style hold-open device.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L1, R1

Single Compartment Door

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 3/32" (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1” x 9/16” (1” x 0.43”) closed-cell ”P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L3, L4, R3, R4

Double Compartment Door

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pans shall be constructed from 3/32" (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-degree bend to form an integral drip rail.

The compartment doors shall have a 1” x 9/16” (1” x 0.43”) closed-cell ”P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the primary door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have two (2) dual stage rotary latches, each with a 750 lb rating to hold the door in the closed position. The latches shall be mounted at the top and bottom of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latches. The paddle handle shall be connected to the rotary latches by 5/32" (.156") diameter rods. Cable actuation shall not be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pins shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

Double door latch to have latch brackets fabricated from .125 aluminum smooth plate, installed with "PULL" tags #1032993 for left side and #1032294 for right side.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L2, L5, R2, R5

SHELVES

Adjustable Shelf [Qty: 10]

There shall be an aluminum adjustable shelf provided for a compartment as specified.

The shelf shall be constructed of 3/16” (.187”) smooth aluminum plate. The shelf shall have a minimum 2” front and rear lips to accommodate optional plastic interlocking compartment tile systems and shall be capable of holding 100 lbs on compartments with tracks mounted on back wall (compartments up to appoximately 12" deep) or shall be capable of holding 250 lbs with tracks mounted on forward and rearward walls.

The shelf shall be sized, width and depth, to match the size and location in the compartment.

Adjustable Tracks [Qty: 10]

Tracks shall be provided in [#LOC] for use with adjustable shelves and/or trays in deep non-transverse compartments. The tracks shall be vertically mounted and attached to the side and/or rear walls of the compartments.

COVERS

Hose Bed Cover

A cover constructed of Red 18 oz. PVC vinyl coated polyester shall be installed over the apparatus hose bed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The front edge of the cover shall be mechanically attached to the body. The sides of the cover shall be held in place with heavy duty Velcro strips running the length of the hose bed. The rear of the cover shall have an integral flap that extends down to cover the rear of the hose bed.This flap shall be secured in place along the lower edge with flexible cord that fasten to steel hook(s) mounted to body to comply with the latest edition of NFPA 1901.

Vinyl Crosslay Cover

A cover constructed of Red 18 oz. PVC vinyl coated polyester shall be installed on the crosslay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch.

The cover shall be held in place across the top of the body by chrome snaps. The sides of the cover shall have integral flaps that extend down to cover the sides of the crosslay. The side flaps shall be secured in place to comply with the latest edition of NFPA 1901.

DEF Tank Cover

A cover shall be installed over the compartment mounted Diesel Exhaust Fluid (DEF) tank. Includes a hinged door to access the DEF tank fill. Material and finish of the cover to match the compartment walls.

PUMP MODULE

PUMP PANELS

Side Mount Pump Panels

The driver and officer side pump panels shall be constructed of 14 gauge stainless steel. Each panel shall have the ability to be removed from the module for easier access and for maintenance in the pump area.

Pump Access Door

The officer side pump module shall include an upper horizontal hinged pump access door.

The door shall be constructed of 14 gauge brushed stainless steel. The compartment door shall be securely attached with a full-length stainless steel piano type hinge with 1/4" pins. The hinge shall be "staked" on every other knuckle to prevent the pin from sliding. The door shall include two (2) push-button style latches to secure the door in the closed position and two (2) hold-open devices to hold the door in the open position.

MISC PUMP PANEL OPTIONS

Pump Panel Tags

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

PUMP MODULE OPTIONS

Flex Joint

The area between the pump modules and body shall include a rubber flex joint.

WATER TANK

Booster Tank

The booster tank shall be T-shaped in configuration and shall have a capacity of 400 gallons.

The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2” (0.50”) thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40” apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3” above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

TANK PLUMBING

Tank Fill 2 Akron Valve

One (1) 2” pump-to-tank fill line having a 2” manually operated full flow valve. The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times. The fill line shall be controlled using a chrome handle with an integral tag.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank to Pump, 3" Akron Valve

One (1) manually operated 3” Akron valve shall be installed between the pump suction and the booster tank in order to pump water from the tank. The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

LADDER STORAGE / RACKS

Ground Ladder Storage

Ladder tunnels shall be provided at the rear of the apparatus on either side of the turntable, and directly under the hose chutes. The ladder rack shall hold: PEL3-35, PEL-24, (2)PRL-16 and FL-10 with rubber block feet. Requires roof ladder option on base section of aerial to meet 115' NFPA requirement

The ladders will be held captive top and bottom by aluminum tracks and slide on friction reducing material. All ladders shall be removable individually without having to remove any other ladder.

Ladder Tunnel Enclosure

The forward end of the ladder tunnel(s) shall have a box type enclosure to allow for doors at the rear of the ladder tunnel.

HANDRAILS / STEPS

Slide-Out Platform

A slide-out platform shall be provided integral with the driver side running board adjacent to the pump panel. The platform shall be 21” deep and shall be constructed of 1/8” (0.125”) aluminum treadplate with a multi-directional, aggressive gripping surface. The platform shall utilize a maintenance-free slide system incorporating stainless steel shoulder bolts that slide in slotted heavy-wall aluminum angles. Notches shall be provided at each end of the slots to hold the platform in both the extended and retracted positions.

The NFPA pump throttle height requirement shall be measured from the top of the slide-out platform on all aerials and from the ground on side mounted pump operator panels on non-aerial apparatus.

Flop Down Step

A single rear flop down step shall be provided at the back of the unit to reduce the stepping height from ground to tailboard. The step shall be constructed of .125" aluminum diamond plate. Side brackets constructed of .375" aluminum plate shall support the fabricated step. The step shall be approximately 36” wide and come with a locking device to hold the step up in the stored position. The step shall not reduce the angle of departure.

MISC BODY OPTIONS

Mud Flaps

Black mud flaps with E-ONE logo shall be provided for the body wheel wells.

Hose Bed Divider

There shall be a hose bed divider provided the full fore-aft length of the hose bed.

The hose bed divider shall be constructed of 1/4” (0.25”) smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3” radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.

The divider shall be adjustable from side to side in the hose bed to accommodate varying hose loads.

Body Wheel Well

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8” (0.125”) aluminum treadplate. The wheel well trim fenderett shall be constructed from 6063-T5 formed aluminum extrusion. The wheel well liners shall be constructed of a 3/16” (.187”) composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

Anodize Aluminum Trim

A anodize aluminum trim shall be located at the bottom edge of all body compartment openings including pump enclosure with painted edge (as applicable). The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

SCBA BOTTLE STORAGE

SCBA Storage

Four (4) SCBA bottle storage compartments shall be provided. The compartments shall be 8” diameter by 25” deep and located two (2) each side in the body wheel well area.

Each SCBA bottle shall be held in place by a hinged cast aluminum door with a positive latch.

The inner SCBA storage tube shall be made of high strength polyethylene to provide additional protection to the surface of the SCBA bottles.

SCBA Strap

Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

PUMPS

Pump Rating

The fire pump shall be rated at 1250 GPM.

Fire Pump Extended 3 Year Warranty

Hale Pump Pro-Tech extended 3 year warranty in addition to the standard 2 year warranty.

Covers labor for years three, four and five above the standard warranty.

Fire Pump System

The pump shall be a midship mounted Hale Qflo single stage centrifugal pump. The pump shall be mounted on the chassis frame rails and shall be split-shaft driven.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump body shall be horizontally split in two (2) sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping.

The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Two (2) 6” diameter suction ports with 6” NST male threads and removable screens shall be provided, one (1) each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

Mechanical Seal

A mechanical seal shall be provided on the inboard side of the pump. The mechanical seal shall be two (2) inches in diameter and shall be spring-loaded, maintenance-free, and self-adjusting.

Discharge Manifold

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

Pump Shift

The pump shift shall be pneumatically-controlled using a power shifting cylinder.

The power shift control valve shall be mounted in the cab and be labeled ”PUMP SHIFT”. The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled ”PUMP ENGAGED”. The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled ”OK TO PUMP”. This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lock-up (4th gear lock-up).

Test Ports

Two (2) test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump.

PUMP CERTIFICATION

Pump Certification

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer`s Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

PUMP OPTIONS

Speed Counter

The test connection shall be installed on the pump panel to manually verify the vehicle engine speed displayed on the electronic tachometer.

Steamers, Flush+1

The pump 6" steamer intake(s) shall be mounted approximately 1” from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected. (Example 72" or 76" modules.)

Location: driver's side, officer's side.

Vernier Engine Throttle

One (1) vernier type throttle shall be mounted on the pump operator`s panel and shall be used to control the engine RPM. This system, specifically designed for fire apparatus, shall monitor and control the engine providing power to the fire pump. The system shall control the engine speed when the pump system has been placed into gear. The system shall monitor engine RPM and shall maintain the engines selected speed.

One (1) pump panel mounted ”GREEN” indicator light shall be positioned above the throttle control on the pump operator`s panel. The light shall be energized when the pump shift has been completed, chassis automatic transmission has obtained converter lock-up (4th gear lock-up), and the chassis parking brake is set.

An interlock system shall be provided to prevent the advancement of the engine speed until the apparatus parking brake is applied, the chassis transmission is in the proper gear, and the fire pump gearbox is properly engaged. When the above conditions have been met, the ”OK TO PUMP” light shall be illuminated.

Manual Master Drain

A manual master drain valve shall be installed and operated from the driver side. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal.

The manual master drain valve shall have twelve (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

Hale Pressure Relief Valve

A Hale pressure relief valve shall be provided and mounted on the pump operator`s panel. The pump shall be equipped with an automatic pressure control device. A single bronze variable pressure setting relief valve shall be provided and be of ample capacity to prevent an undue pressure rise as outlined in NFPA 1901. The relief valve shall be normally closed and shall open against pump pressure. A relief valve control wheel with a control light to signal when open shall be mounted on the pump operator`s panel.

Pump Cooler

The pump shall have a 3/8” line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line shall be controlled from the pump operator`s panel by a Innovative Controls 1/4 turn valve with "T" handle. Each 1/4 turn handle grip shall feature built-in color-coding labels and a verbiage tag

Priming System

An electrically-driven Hale ESP priming pump shall be provided for the water pump. The primer shall be positive displacement rotary vane type that requires no lubricant. The primer motor shall be heat-treated, anodized aluminum specially coated for wear and corrosion resistance.

One (1) priming control, located at the pump operator`s position, shall open the priming valve and start the priming motor. The priming valve shall be electronically interlocked to the ”Park Brake” circuit to allow priming of the pump before the pump is placed in gear.

INTAKES

Left Intake 2.5 Akron Valve

One (1) 2-1/2” suction inlet with a manually operated 2-1/2” Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2” NST female chrome inlet swivel, and shall be equipped with a chrome plated rockerlug plug with a retainer device.

The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4” bleeder valve assembly will be installed on the left side pump panel.

INTAKE OPTIONS

Intake Relief Valve

The pump shall be equipped with an Akron style 59 cast brass, variable-pressure-setting relief valve on the pump suction side. It shall be designed to operate at a maximum inlet pressure of 250 PSI. The relief valve shall be normally closed and shall be set to begin opening at 125 PSI in order to limit intake pressures in the pumping system. When the relief valve opens, the overflow water shall be directed through a plumbed outlet to discharge below the body in an area visible to the pump operator. The overflow outlet shall terminate with a male 2-1/2” NST threaded fitting to allow the overflow water to be directed away from the vehicle with a short hose (supplied by the fire department) during freezing weather or under other conditions where an accumulation of water around the apparatus might be hazardous.

DISCHARGES AND PRECONNECTS

1.5 Single Crosslay Akron Valve [Qty: 2]

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2” brass swivel with a 1-1/2” hose connection to permit the use of hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2” heavy-duty hose coming from the pump discharge manifold to the 2” swivel. The hose shall be connected to a manually operated 2” Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 1 & 2.

Discharge Left Panel 2.5 Akron Droop

One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with 2-1/2” NST threads to help prevent kinking of the discharge hose. The 30 degree chrome droop

shall be an integral part of the discharge valve and shall be equipped with a chrome plated rocker lug cap with a retainer chain.

The discharge shall be supplied with a 3/4” bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left side discharge 1, left side discharge 2.

Discharge Right Panel 2.5 Akron Droop

One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with chrome plated 2-1/2” NST threads to help prevent kinking of the discharge hose. The 30 degree chrome droop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rocker lug cap with a retainer chain.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 1, right side discharge 2.

4'' Waterway Discharge Electric Akron

A 4” diameter discharge with an electrically actuated Akron valve shall be provided from the pump to the aerial waterway.

The valve shall be 4" Akron 8800HD series with bronze flat ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve shall utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

DISCHARGE OPTIONS

IC Push/Pull Control

The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

Bleeder Drain Valve [Qty: 7]

The bleeder/drain valves shall be Innovative Controls ¾” ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve, also supplied by Innovative Controls. The color labels shall also include valve open and close verbiage.

Discharge/Intake Bezel

Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color and verbiage. These bezel are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

Akron Electric Valve 9333 Controller

An Akron Brass Style 9333 Valve Controller shall be provided with a five year manufacturer warranty. The display shall be a full color LCD display with a backlight and manual adjustment of the brightness as well as an auto-dimming option. The electric controls shall provide true position feedback, requiring no clutches in the motor or current limiting. The unit shall be sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. The controller will provide an LCD display showing valve position indication and have up to three preset locations that can be user set and easily recalled upon each use. Valve position indication will be determined from true position feedback and indicate the exact position of the valve.

Two additional buttons shall be available to be used for preset selection, preset activation and menu navigation.

Locate on pump operator panel to control waterway discharge.

GAUGES

GAUGE IC 10 LED WATER TANK LEVEL

One (1) Innovative Controls brand water tank level gauge shall be located at the pump operator`s panel to provide a high-visibility display of the water tank level. Ten (10) high-intensity light emitting diodes (LED`s) on the display module shall have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance within full 180 degree visibility.

The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. The long life and extreme durability of LED indicators eliminates light bulb replacement and maintenance. Color coded cover plates shall complete the assembly of the display module to the pump panel. Each display level can be set independently for maximum reliability.

The display shall provide a steady indication of fluid level despite sloshing inside of the tank when the vehicle is in motion due to an "anti-slosh" feature.

ENFO IV System

The apparatus shall be equipped with a Class 1 ENFO IV electronic system and engine operating information display/warning system mounted on the pump operator`s panel. The gauge shall be a self-contained, weatherproof display, approximately 4.5" H x 6" W.

Features:

• Engine RPM - engine RPM shall be displayed numerically.
• System voltage display and alarm - a display shall be provided to indicate voltage and an audible alarm warning of low voltage. If the system voltage drops below 11.9 volts (12V ignition), or below 23.8 volts (24V ignition), for more than 2 seconds the audible alarm shall activate and shall cause the display to alternate between the current value and "LO" to warn the operator.
• Engine temperature display and alarm - a display shall be provided to indicate engine temperature and an audible alarm warning of high engine temperature. If the engine temperature reaches 250 degrees F or higher the audible alarm shall activate and the display shall alternate between the current temperature and "HI" to warn the operator.
• Engine oil pressure display and alarm - a display shall be provided to indicate oil pressure and an audible alarm warning of low oil pressure. If the oil pressure drops to 10 PSI or lower the audible alarm shall activate and the display shall alternate between the current pressure and "LO" to warn the operator.

The connection to the apparatus shall be achieved by the use of a Deutsch four (4) position socket connector.

2.5 [Qty: 7]

The valve discharge gauges shall be 2 ½"(63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

4" Master Pressure Gauges w/Bezel

The master intake and master discharge gauges shall be 4“(101mm) diameter IC pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. Each gauge shall meet ANSI B40.1 Grade 1A requirements with an accuracy of +/- 1% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

The two master gauges shall be installed into decorative chrome-plated zinc mounting bezel that also incorporates a test port manifold and a graphic overlay that identifies the master intake and discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid cast brass with chrome plated plugs. The master gauges shall be installed on the pump panel no more than 6 inches apart. The gauge on the left shall be the master pump intake gauge and display a range from 30” vac to 400 psi with black graphics on a white background. The gauge on the right shall be the master pump discharge gauge and display a range from 0 to 400 psi with black graphics on a white background.

ELECTRICAL SYSTEMS

Vehicle Data Recorder

A vehicle data recorder system shall be provided to comply with the 2009 and 2016 editions of NFPA 1901. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time: 24 hour time
- Date: Year/Month/Day

Occupant Detection System

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle’s park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.

The system shall include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

The display panel shall be located driver's overhead.

Multiplex Electrical System

Electrical System

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

The electrical circuits shall be provided with low voltage over-current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The over-current protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

Multiplex System

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

• The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
• Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
• All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
• Each module that controls a device shall hold its own configuration program.
• Each module should be able to function as a standalone module. No “add- on” module will be acceptable to achieve this form of operation.
• Load shedding power management (8 levels).
• Switch input capability for chassis functions.
• Responsible for lighting device activation.
• Self-contained diagnostic indicators.
• Wire harness needed to interface electrical devices with multiplex modules.
• The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices.

Wiring

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

• NFPA 1901-Standard for Automotive Fire Apparatus
• SAE J1127 and J1127
• IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products)

All wiring shall be copper or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8ga and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6ga and larger shall be SXL or SGT per SAE J1127.

All wiring shall be colored coded and imprinted with the circuit’s function. Minimum height of imprinted characters shall not be less than .082” plus or minus .01”. The imprinted characters shall repeat at a distance not greater than 3”.

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

Wiring Protection

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04” and a tensile strength of 22lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

Wiring Connectors

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier’s component. The connectors and terminals shall be assembled per the connector/terminal manufacturer’s specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

NFPA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA #1901. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

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

2. Alternator performance test at idle:

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

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer`s governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA #1901 Standard, or a system voltage of less than 11.7 volts dc for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts dc for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA Required Documentation

The following documentation shall be provided on delivery of the apparatus:

A. Documentation of the electrical system performance tests required above.

B. A written load analysis, including:

a. The nameplate rating of the alternator
b. The alternator rating under the conditions
c. Each specified component load
d. Individual intermittent loads

Electrical Connection Protection

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components shall also be protected.

The coating shall use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating shall protect electrical connections against the environmental conditions apparatus are commonly exposed to.

Smart Truck Technology

User Interface

The apparatus shall be equipped with a smart truck technology system designed specifically for first responder apparatus. The system shall interconnect major apparatus CAN networks including but not limited to the chassis J1939/OBD2 data, vehicle multiplex system, water pump pressure governor, electric valves and electric actuated deck gun. The system shall securely report real-time vehicle information from these systems via cellular data to a globally supported cloud computing service for storage and real time access via web dashboards. The dashboards shall be accessible by the department's computers, tablets and smartphones.

The smart truck technology installed on the apparatus shall provide real-time notification via text or e-mail when a check engine light is displayed. The notification shall include the fault code and brief explanation for the code to reduce down-time.

The system shall feature a truck down feature on the web-based user interface to allow instant notification of needed apparatus service to both the authorized dealership and OEM via text or e-mail.

The system shall provide remote diagnostics of vehicle subsystems such as VMUX, pressure governors, electric monitors and electric valves.

By use of the web based user interface, the system shall allow for over the air programming updates to various subsystems should the need arise.

The web-based user interface shall also provide the following:

- Fuel and DEF levels
- GPS tracking
- Data logging for apparatus multiplex system
- Easy access to the NFPA VDR data

The smart truck technology shall also feature seamless integration to the HAAS ALERT Safety Cloud providing Responder to Vehicle (R2V) alerts to motorists using navigation apps such as WAZE.

The system shall be designed with an open architecture to incorporate future growth with new technology partners designed to enhance fireground operations

Hardware

Vehicle Gateway

The vehicle gateway module shall be rugged in construction using a durable cast aluminum enclosure designed for emergency vehicle applications. The module shall have sealed Deutsch connectors providing four (4) CAN network ports, one (1) RS-485 port, one (1) Ethernet RJ45 port, embedded cellular modem, Bluetooth and GPS capability. The IoT Core Vehicle Gateway shall be capable of 2 way vehicle telemetry, supporting both remote diagnostics and remote over-the-air software updates.

Antenna

A low profile cellular antenna shall be installed on the cab roof.

Data Plan

A 5 year data plan shall be provided with the initial vehicle purchase. At the end of the 5 year period the department shall be given the option to extend service.

Multiplex Display

The V-MUX multiplex electrical system shall include a display module (Information Center). The display shall be programmed to show door ajar status and diagnostic information in text format.

The display shall have the following features:

- LCD technology
- Four (4) twenty (20) character lines
- Six (6) input / navigation buttons
- Rugged aluminum housing

The display shall be located center of dash.

LIGHT BARS

Light Bar

A Federal Signal model VSLR6 6 pod Vision light system shall be provided. The system shall include two (2) individual (3) pod units.

Each pod unit shall contain three (3) Solaris red LED rotating reflectors. The lens configuration shall be all red. The lightbar(s) shall be installed in the following location: front cab corners.

WARNING LIGHT PACKAGES

Lower Level Warning Light Package

Ten (10) Federal Signal QuadraFlare LED light heads with red lenses and bezels shall be provided.

The rectangular lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows:

• Two (2) QL64-RR lights on the front of the apparatus facing forward.
• Two (2) QL64-RR lights on the rear of the apparatus facing rearward.
• Two (2) QL64-RR lights each side of the apparatus, one (1) each side at the forward most point (as practical), and one (1) each side at the rearward most point (as practical).
• One (1) QL64-RR light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, on side of cab down low just ahead of rear door, and on rear fixed outrigger cover.

All warning devices shall be surface mounted in compliance with NFPA standards.

Lower Level LED Warning Light Flash Rate

The lower level Federal Signal QuadraFlare and/or FireRay LED warning lights shall be set to DoubleFlash 150 - Simultaneous pattern.

WARNING LIGHTS

Upper Rear Warning Lights

Two (2) Federal Signal Sentry model SY12FS rotating lights with a polycarbonate base, a single 55 watt halogen lamp, and a twist-on lexan dome. Each light shall produce 175 flashes per minute. The dome colors to be driver red, officer amber.

The lights shall be located each side at upper rear of body on aerial style brackets, top of light even with top of body to meet upper Zone C requirements.

Hazard (Door Ajar) Light

There shall be a 2” red LED hazard light installed as specified.

The light shall be located center overhead.

SIRENS

Electronic Siren

A Federal PA300 siren model 690010 solid state electronic siren with attached noise-canceling microphone shall be installed. The unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class ”A” requirements.

Operating modes shall include Hi-Lo, yelp, wail, P.A., air horn and radio re-broadcast.

The siren shall be recessed mounted in the cab.

Electronic Siren Control Location

The electronic siren control shall be located in the center overhead.

SPEAKERS

Siren Speaker

One (1) Federal Signal model ES100 Dynamax 100 watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished model MSFMT with ”E-ONE” grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

Speaker dimensions shall be: 5.5 in. high x 5.9 in. wide x 2.5 in. deep. Weight = 5.5 lbs.

The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

The speaker shall be located driver side front bumper.

DOT LIGHTING

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

LED Marker Lights

LED clearance/marker lights shall be installed as specified.

Upper Cab:
• Five (5)amber LED clearance lights on the cab roof.

Lower Cab:
• One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:
• One (1) red Trucklite LED clearance light each side, rear of body to the side.

Lower Body:
• Three (3) red Trucklite LED clearance lights centered at rear, recessed in the rubrail.
• One (1) red Trucklite LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.
• One (1) amber Trucklite LED clearance light each side front of body just in front of rear wheels, recessed in the rubrail.
• One (1) amber Trucklite LED clearance/auxiliary turn light each side front of body, recessed in the rubrail.

Tail Lights

One (1) Federal Signal model QL64Z-BTT red LED (Light Emitting Diode) light, one (1) Federal Signal model QL64Z-ARROW amber LED light and one (1) Federal Signal QL64Z-BACKUP white LED light shall be installed in a Cast 3 housing in a vertical position each side at rear and wired with weatherproof connectors.

Light functions shall be as follows:

• LED red running light with red brake light in upper position.
• LED amber populated arrow pattern turn signal in middle position.
• LED white back-up light in lower position.

A one-piece polished aluminum trim casting shall be mounted around the three (3) individual lights in a vertical position.

License Plate Bracket

There shall be bracket fabricated from aluminum diamond plate, secured to rear of the body to accommodate a license plate.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package

There shall be a minimum of one (1) 4” circular LED (Light Emitting Diode) mounted in each body compartment greater than 4 cu. ft. Compartments over 36” in height shall have a minimum of two (2) lights, one (1) high and one (1) low. Transverse compartments shall have a minimum of two (2) lights, located one (1) each side.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel. Each light shall be in a resilient shock-absorbent mount for improved bulb life.

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch with a polycarbonate actuator and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

Step Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the steps around the apparatus in accordance with current NFPA requirements. The lights shall be 4” circular LED (Light Emitting Diode) with clear lenses (2" if space is limited) mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be switched from the cab dash with the work light switch.

Ground Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be 4” circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

Ladder Tunnel Light [Qty: 2]

An EON LED light shall be provided to illuminate the ladder tunnel at the opening. The light shall be wired through the door ajar circuit on the ladder tunnel door.

LIGHTS - DECK AND SCENE

Hose Bed Light

A Truck-Lite round LED light model 81380 shall be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The hose bed light shall be switched with the work light switch in the cab.

Deck Lights

Two (2) Truck-Lite round 12 volt LED model 81380 floodlights shall be installed at the rear of the apparatus. The rear deck lights shall be switched with the work light switch in the cab.

Location: (1) each side of body rear facing up high.

Crosslay Light

A Truck-Lite round LED light model 81380 shall be installed at the rear area of the crosslay to provide crosslay lighting per current NFPA 1901. The crosslay light shall be switched with the work light switch in the cab.

LIGHTS - NON-WARNING

Pump Compartment LED Light

An LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be wired to operate with the work light switch in the cab.

LED Pump Panel Light Package

Three (3) TecNiq model E10 LED lights shall be mounted under a light shield directly above each side pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

Engine Compartment Light

There shall be lighting provided to illuminate the engine compartment area in compliance with NFPA 1901. The light shall be an Optronics ILL22 Series LED that has a polycarbonate lense, sealed / waterproof housing and integral switch. The light wiring circuit shall activate when the cab is tilted and master power is switched on.

CONTROLS / SWITCHES

Door Ajar Alarm

An audible alarm shall be mounted in the cab interior and wired into the door ajar or indicator.

Foot Switch

A heavy duty metal floor mounted foot switch shall be installed to operate the air horns. It shall be located driver's side, officer's side.

CAMERAS / INTERCOM

Two-Way Intercom

A Fire Research ACT two-way intercom system shall be installed to provide communications between the turntable control station and the aerial tip. The intercom system shall include two (2) speakers and two (2) control modules; one (1) with a push-to-talk button at the turntable control station and one (1) hands free at the aerial tip.

The control modules shall have push-button volume control and a LED volume display. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall have active noise cancellation and be designed for exterior use.

MISC ELECTRICAL

Back-Up Alarm

An electronic back-up alarm shall be supplied. The 97 dB alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

AERIAL MODEL

HP75 Aerial Ladder

Performance

A 75` telescopic aerial ladder of the open-truss design shall be installed at the rear of the vehicle with the aerial ladder pointed forward when it is in the travel position. The aerial ladder shall meet or exceed the requirements of NFPA 1901 (2016 edition), Sections 19.2 through 19.6 and Sections 19.17 through 19.25.

The aerial ladder shall consist of three (3) telescopic ladder sections capable of operating from minus (-) 8 degrees to plus (+) 76 degrees elevation at any ladder extension to give a full range of movement. The aerial ladder shall be designed to provide continuous egress for firefighters and civilians from any angle of elevation to the ground as defined in the current edition of NFPA 1901.

The aerial ladder shall have a rated vertical height of 75` measured in a vertical plane from the outermost rung of the outermost fly section to the ground with the ladder at maximum elevation and extension as defined in the current edition of NFPA 1901.

The aerial ladder shall have a rated horizontal reach of 68` measured in a horizontal plane from the centerline of the turntable rotation to the outermost rung of the outermost fly section with the aerial ladder extended to its maximum horizontal reach as defined in the current edition of NFPA 1901.

The aerial ladder shall utilize a single pair of stabilizers - one (1) on the left and one (1) on the right opposite each other - with a maximum horizontal stabilizer spread of 16` across the centerlines of the footpads. Aerial ladders which require two (2) sets of extending stabilizers or that have a maximum stabilizer spread greater than 16` are not acceptable because of the need to utilize the aerial ladder in confined areas. Aerial ladders that require a set of drop down jacks behind the cab are not acceptable. This type of configuration decreases compartment space and increases the overall vehicle weight, causing increased bending load on the chassis. In addition, it raises the water tank, which affects the overall center of gravity of the truck. **NO EXCEPTIONS.**

The aerial ladder shall have a rated tip capacity of 550 lbs. when the ladder is unsupported at full extension and 0 degrees elevation as defined by the current edition of NFPA 1901. This capacity may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated tip capacity. The rated tip capacity shall include to an allowance of 50 lbs. for equipment mounted at the tip of the ladder. Ladders which have a rated NFPA tip capacity of less than 550 lbs. are not acceptable because of the need to utilize the aerial ladder for rescue operations in which two (2) personnel may be on the tip at the same time. **NO EXCEPTIONS.**

The ladder shall be able to provide full operating capacities in up to 35 mph wind conditions.

Aerial Ladder Construction

To ensure a high strength-to-weight ratio, high heat resistance, and an inherent corrosion resistance, the aerial ladder shall be constructed entirely of extruded high-strength aluminum alloy. **NO EXCEPTIONS**.

All side rails, rungs, handrails, uprights and K-braces shall be made of structural 6061-T6 aluminum alloy extrusions. All material shall be tested and certified by the material supplier. All ladder sections shall be semi-automatically welded by inert gas shielded-arc welding methods using 5356 aluminum alloy welding wire. Structural rivets or bolts shall not be utilized in the ladder weldment sections.

Due to the unpredictable nature of fireground operations, a minimum safety factor of 2.5 to 1 is desired. This structural safety factor shall apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor shall be as outlined in NFPA 1901 A.19.20.1: **NO EXCEPTIONS**

DL = Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components.
RL = Rated capacity stress. Stress produced by the rated capacity load of the ladder.
WL= Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system.
FY = Material yield strength. The stress at which material exhibits permanent deformation.

2.5 x DL + 2.5 x RL + WL equal to/less than FY

The minimum NFPA specification is exceeded in this paragraph by requiring safety margin above 2 to 1 while flowing water.

The stability factor or tip over safety margin shall be a minimum of 1.5 to 1 as defined by NFPA 1901 19.21.

An independent, third-party engineering firm shall verify both the structural safety factor and the stability factor. Design verification shall include computer modeling and analysis, and extensive strain gauge testing performed by an independent registered professional engineer. Written certification from the independent, third-party engineering firm shall be made available by the manufacturer upon request from the purchaser. **NO EXCEPTIONS**

All welding of aerial components -- including the aerial ladder sections, turntable, torque box, and outriggers -- shall be performed by welders who are certified to American Welding Society Standards D1.1, D1.2 and D1.3 as outlined in the current edition of NFPA 1901. **NO EXCEPTIONS**.

The weldment assemblies of each production unit shall be tested visually and mechanically by an ASNT-certified level II non-destructive test technician to comply with the current edition of NFPA 1901. Testing procedures shall conform to the American Welding Society Standard B1.10 Guide for non-destructive testing. Test methods include a thorough visual inspection of each weld and the use of dye penetrates where applicable.

Each ladder section shall consist of two (2) extruded aluminum side rails and a combination of aluminum rungs, tubular diagonals, verticals, and two (2) full-length handrails. The rungs on all sections shall be K-braced for maximum lateral stability. This K-bracing shall extend to the center of each rung to minimize ladder side deflection.

The ladder rungs shall be spaced on 14" centers and shall be designed with an integral skid-resistant surface to eliminate the need for rubber rung covers. A "D" shaped rung shall be utilized to provide a larger step surface at low angles and a more comfortable grip at elevated positions. The larger step surface is critical to distribute the load on the bottom of the firefighters` foot. Round rungs are not acceptable as they increase the stress load on the foot and are more likely to cause bruising. The minimum design load of each rung shall be 500 lbs. distributed over a 3-1/2" (3.5")-wide area in the center of the length of the rung as required in the current edition of NFPA 1901. **NO EXCEPTIONS.**

To provide a wide working area with an easy-to-grasp handrail, the aerial ladder shall exceed the requirements of the current edition of NFPA 1901 regarding the minimum ladder section inside width and the minimum handrail height by providing the following inside widths and handrail heights:

A fly section width of at least 25" is required to allow a 24" wide stokes basket to fit between the handrails.

Section	**Width**	**Height**
Base Section	37-5/8"	22-7/8"
Second Section	30-3/4"	19-3/8"
Fly Section	25-3/16"	16-1/4"

Ladder Extension/Retraction Mechanism

Both power extension and power retraction shall be furnished and shall meet the requirements of the current edition of NFPA 1901. Extension and retraction shall be by way of two (2) hydraulic cylinders mounted on each side of the base section of the aerial ladder. Each cylinder shall have a 3-1/4" (3.25") bore and a 59-1/2" (59.5") stroke.

The cylinders shall operate through a block and tackle cable arrangement to extend and retract the ladder. Maximum extension of the ladder is to be automatically limited by the stroke of the cylinders. The normal operating cable safety factor shall be 5.0 to 1 and the stall safety factor shall be 2.0 to 1 based on the breaking strength of the cables. The minimum ratio of the diameter of the block and tackle sheave to the diameter of the cable shall be 12.0 to 1 to allow smooth

operation and reduce bending stresses on the cables. The cables shall be treated with Pre-Lube 6 for increased service life.

The cable sizes shall be as follows:

2nd section (4 cables - 2 extend, 2 retract)	7/16” 6 x 19 galvanized cable
Fly section (4 cables - 2 extend, 2 retract)	1/4” 7 x 19 galvanized cable

The aerial ladder sections shall slide within each other. Nylatron NSM pads shall be utilized between each section to minimize friction. Four (4) C-type interlocking load transfer stations shall enclose the pads. The transfer stations shall be located at the upper portion of the base and the second ladder sections.

Aerial Extension Indicator

Reflective tape stripes shall be installed on the aerial ladder handrail of the base section to indicate extension in 10` increments. A reflective dot on the base of the second section shall provide a visual reference for the operator to estimate aerial elevation.

Aerial Finish

To reduce maintenance expense, the aerial ladder shall have a natural aluminum swirled finish. This will also allow visible inspection of all ladder weld joints without having to remove paint or body filler to reveal the weld bead. Ladders finished with paint or with any other material that covers the base metal and weld joints are not acceptable. **NO EXCEPTIONS.**

Operation Times

The aerial ladder shall complete the elevation-extension-rotation test described in the current edition of NFPA 1901 in not more than 120 seconds or less. **NO EXCEPTIONS.** This test involves raising the aerial from the bedded position to full elevation and extension and rotating it 90 degrees. This test is to begin with the stabilizers deployed.

In addition to completing the test described above, the aerial ladder shall be capable of performing the following operations in the times noted:

Time to extend ladder	maximum 35 seconds
Time to retract ladder	maximum 25 seconds
Time to raise ladder	maximum 20 seconds
Time to lower ladder	maximum 30 seconds
Time to rotate 180 degrees	maximum 55 seconds

Aerial Ladder Rated Capacities

The aerial ladder shall have a rated capacity of 550 lbs. when the ladder is unsupported at full extension and 0 degrees elevation as defined by the current edition of NFPA 1901. This rated capacity consists of a 500 lb personnel rating and a 50 lb. equipment rating. The 50 lb. capacity for the equipment is for mounted equipment at the tip. This capacity may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated tip capacity. The rated tip capacity shall be in addition to an allowance of 50 lbs. for equipment mounted at the tip of the ladder.

A sign mounted at the base of the aerial ladder shall communicate the aerial ladder capacity ratings for the following configurations when the ladder is in the unsupported, fully extended configuration while maintaining a 2.5 to 1 safety margin. These capacities may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated capacities. For purposes of this sign, it shall be assumed that each person weighs 250 lbs. In no case shall the actual combined weights of personnel, equipment, and other loads exceed the rated capacities. The loads for each configuration are in addition to an allowance of 50 lbs. for equipment mounted at the tip of the ladder.

Condition #1- Tip load only, no water flowing

Elevation	Capacity	Pounds
-8 to 40 degrees	2 people	500 lbs.
41 to 49 degrees	3 people	750 lbs.
50 to 76 degrees	4 people	1000 lbs.

Condition #2- Distributed loads no water flowing (These include one person at the tip)

Elevation	Capacity	Pounds
-8 to 30 degrees	3 people	750 lbs.
31 to 45 degrees	5 people	1250 lbs.
46 to 76 degrees	8 people	2000 lbs.

Condition #3- Ladder tip load while flowing 1000 gpm with pre-piped waterway

Elevation	Capacity	Pounds
-8 to 76 degrees	2 people	500 lbs.

Hydraulic System

The hydraulic fluid reservoir shall consist of a 52 gallon tank mounted to the torque box and plumbed to the suction side of the hydraulic pump. The tank shall be supplied with a removable top to allow access to the tank strainer filter. There shall be ports for a return line and a tank drain on the reservoir. The reservoir fill cap shall be marked ”Hydraulic Oil Only”. Gated valves under the tank shall facilitate filter changes. The hydraulic fluid reservoir shall have sufficient volume and be mounted in such a manner to minimize heat build up and meet the performance requirement in the current edition of NFPA 1901.

An interlock device shall be provided to prevent activation of the aerial ladder hydraulic pump until either the transmission is placed in neutral and the parking brake is set, or the transmission is placed in drive and the rear driveline is disengaged as outlined in NFPA 19.17.3.

All hydraulic components with non-sealing moving parts, whose failure could result in the movement of the aerial, shall have a minimum burst strength of four (4) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of NFPA 1901.

All hydraulic components with dynamic sealing parts, whose failure could result in the movement of the aerial, shall not begin to extrude or otherwise fail at pressures at or below two (2) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of NFPA 1901.

All hydraulic hoses and fittings shall have a minimum burst strength of at least three (3) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of NFPA 1901.

All hydraulic tubing shall be made of stainless steel whenever possible. It shall have a minimum burst strength of four (4) times the maximum operating pressure to which it is subjected in order to exceed the requirements of the current edition of NFPA 1901. Hydraulic systems composed primarily of hose or galvanized steel lines shall not be acceptable due to the higher maintenance requirements of the system over the life of the vehicle. **NO EXCEPTIONS**

A hydraulic oil pressure gauge shall be supplied at the aerial ladder control station as required by the current edition of NFPA 1901.

The hydraulic system shall use 5w-20 multi-weight, SAE 32 grade oil. It shall incorporate the following filters in order to remove contaminants and provide dependable service:

Reservoir Breather: 10-micron
Magnetic Reservoir Strainer: 125-mesh
Pressure Filter (Torque Box): 3-micron
Return Filter: 10-micron

The aerial ladder hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on the hydraulic cylinders. To ensure reliable performance of holding valves, hoses shall not be permitted between a holding valve and cylinder. **NO EXCEPTIONS.**

The aerial shall incorporate the use of stainless steel tubes inside the torque box and jack legs to minimize the possibility of hydraulic leaks.

Hydraulic power to the ladder shall be transferred from the torque box by a hydraulic swivel fitting.

Auxiliary Hydraulic Pump

The hydraulic system shall include an auxiliary 12-volt hydraulic pump powered by the chassis electrical system in case the vehicle engine or the primary hydraulic pump fails . The auxiliary pump shall allow operation at reduced speeds to store the aerial device and retract the outriggers for road transportation. Self-centering switches shall be provided at the turntable and at each stabilizer control station to operate the auxiliary system.

Forward Aerial Support

The aerial ladder support shall be constructed from 7/8" thick steel plate. Bolt-in diagonal bracing shall be installed on the support structure in an "X" pattern to restrict to side movement. This design shall allow for a pre-determined amount of flex preventing premature failure that can be found in an overly rigid structure. The support shall be located behind the rear wall of the cab and shall be bolted to the frame rails to allow removal in case of accidental damage.

Aerial Torque Box

In order to maximize structural strength and vehicle stability while minimizing rear axle weight, a vertical cylindrical aerial torque box shall be used. Vehicles utilizing horizontal square aerial torque boxes are not acceptable because the heavy weight of these designs conflicts with the goal of utilizing a single rear axle.

The aerial torque box shall be welded from 10” x 28.5 lbs./ft. A36 grade structural steel channels with 3/8” (0.375”) thick top and bottom plates and 3/8” (0.375”) thick integral bulkheads. The pedestal shall be a 24” outside diameter cylinder with a 3/8” (0.375”) wall and shall connect the rotation bearing mounting plate to the torque box.

The aerial torque box pedestal assembly shall be bolted to the chassis frame with sixteen (16) 3/4” (0.75”) diameter Grade 8 bolts. It shall be utilized to mount the stabilizers and the reservoir for the aerial hydraulic system.

Stabilization System

The vehicle shall come equipped with an out-and-down stabilization system. The system shall consist of two (2) hydraulically-operated out-and-down style stabilizers welded to the torque box and mounted under the frame for a low center of gravity.

The stabilizers shall have a maximum spread of 16` across the centerlines of the footpads when fully extended. The internal stabilizer tubes shall be 8” x 10” with 1/2” thick top and bottom plates and 5/8” thick sides. They shall be made of steel with a 100,000-psi minimum yield strength and shall be extended out by hydraulic cylinders. The external stabilizer tubes shall be 9-3/4” x 11-3/4” with 3/8” wall thickness. The internal tubes shall slide on low friction pads.

The stabilizers shall provide the vehicle with a tip-over safety margin of 1.5 times the rated aerial ladder load in any position the aerial ladder can be placed when the vehicle is on a firm and level surface.

The aerial shall be able to sustain a 1-1/3 to 1 rated load on a 5 degree slope downward in the position most likely to cause overturning as outlined in NFPA 1901 19.21.3.1. The maximum grade the apparatus can be set up on is 6.8 degrees (12 percent). On a 6.8-degree (12 percent) grade, the apparatus can be leveled within a 3.4 degree (6 percent) operating range with the apparatus cab facing uphill.

The stabilizer extension cylinders shall have a 2.5” bore and a 51.5” stroke. The stabilizer lift cylinders shall be mounted on the end of the stabilizer tube and shall have a 4” bore and a 22” stroke.

The stabilizer cylinders shall be supplied with dual pilot-operated check valves on each stabilizer cylinder to hold the cylinder either in the retracted (stowed) or the extended (working) position should a hydraulic line be severed at any point in the hydraulic system. Stabilizers shall contain safety lock valves. This assures there will be no ”leak down” of stabilizer legs. Mechanical pins are not required. This feature contributes to efficient set-up and field operation.

Each stabilizer leg shall have a 1/8” thick bright aluminum diamond plate shield, full height and width of the stabilizer opening, attached to the end of the leg. This plate shall serve as a protective guard and a mounting surface for the stabilizer warning lights. The top, forward, and rear edges shall be flanged for added strength. Each stabilizer shall have one (1) red warning light mounted on the outboard face of the protective guard.

The stabilizers shall be connected to a warning light in the cab to warn the operator when the stabilizers are deployed. A floodlight shall be provided in each stabilizer body opening to illuminate the stabilizer and the ground. The light shall automatically come on with the deployment of a stabilizer.

The ground contact area for each stabilizer shall be a 12” diameter circular disc without auxiliary stabilizer pads and a 24” x 24” square plate with auxiliary stabilizer pads deployed. The ground

pressure shall not exceed 75 psi when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the auxiliary stabilizer pads deployed.

Stabilizer Controls

The main stabilizer control panel shall be located on the rear of the apparatus to control the operation of the stabilization system. The panel shall be labels ”JACKS” and shall provide a master on-off power switch and indicator light, two (2) yellow indicator lights - one (1) for the left jack and one (1) for the right jack - to signify when each jack is fully extended and is in firm contact with the ground, a green interlock indicator light to signify when both jacks (stabilizers) are set, and a manual transfer switch to allow the operator to manually shift the hydraulic power from the jacks (stabilizers) to the ladder once the interlock light is green.

Horizontal extension and vertical lift of the stabilizers shall be controlled by two (2) switches - one (1) for the left stabilizer and one (1) for the right stabilizer - located at the rear of the apparatus just above the brake light on each side, so that the operator may observe the stabilizers during deployment. In operation, the stabilizer on each side must be fully extended horizontally before hydraulic power is automatically shifted to the vertical lift cylinder to level the vehicle. An audible alarm with a minimum 87 dbA shall sound while the stabilizers are in motion as required by the current edition of NFPA 1901. Stabilizer deployment from the stored position to the operating position shall be completed in less than 60 seconds. **NO EXCEPTION** Two (2) switches to activate the auxiliary hydraulic pump shall also be provided - one (1) on each side below the stabilizer switch - to retract the stabilizers in case the main hydraulic pump fails. The stabilizer switch and the auxiliary hydraulic pump switch on each side shall be protected from impacts by an inverted U-shaped guard made from aluminum diamond plate.

Two (2) switches - one (1) on each stabilizer leg - shall sense when the leg is in firm contact with the ground. This condition shall be indicated on the main stabilizer control panel by a yellow indicator light for each side.

Leveling of the apparatus shall be performed manually by the operator using two (2) color-coded level indicators at the rear of the apparatus in order to ensure a visual confirmation that it is safe to operate the aerial ladder. The indicator for the front-to-rear level shall be located inside the aerial ladder turntable stairwell on the left side of the vehicle near the rear. The indicator for the side-to-side level shall be located above the rubrail on the rear of the vehicle near the rear suction inlet. **NO EXCEPTIONS**

The aerial ladder hydraulic system shall be provided with an interlock that prevents rotation of the aerial ladder until both the stabilizers are down and properly set. Additionally, the system shall not permit stabilizer movement unless the aerial ladder is seated in the forward aerial support cradle in the travel position. Th e interlock system shall have a manual override with access through a door at the rear of the truck.

Upper Turntable

The upper turntable assembly shall connect the aerial ladder to the turntable bearing. It shall be fabricated from 3/8” A-572 grade 50 steel and shall have a mounting position for the aerial elevation cylinders, the ladder connecting pins, and the upper turntable operator`s position.

One (1) 34-1/4” diameter turntable bearing with a 3” drive gear face shall be bolted to the top of the bearing mounting plate with twenty-six (26) 3/4” diameter Grade 8 plated bolts. Gear teeth shall be stub tooth form. The rated overturning moment of the turntable bearing shall be a minimum of 238,000 ft-lbs.

The operator`s turntable platform shall be constructed of 3/16” aluminum treadplate with ”Gator Grip” non-skid integral surface mounted on a tubular frame. The platform shall extend from the left side of the aerial control station to the right side ladder rail. The platform shall extend 23” from the pedestal control station base, with a width of approximately 18”. The rear of the platform shall extend approximately 19” back from the turntable gear pedestal and shall be approximately 40” wide at the rear. The platform shall be fastened by grade 8 bolts. Two (2) tubular steel handrails, each with an anti-slip finish, shall be installed on the on the right and left sides of the turntable platform. Two (2) Fire Research brand ManSaver bars, equipped with tubular padding, shall be installed between the railings. The bars shall lift up and inward (towards the ladder) permitting easy entrance to the ladder and control console. The rails shall be a minimum 39-3/4” high and shall not increase the overall travel height of the vehicle.

Elevation Mechanism

Two (2) 5” diameter elevating cylinders shall be mounted on the underside of the base section of the aerial ladder. A 1-3/4” pin shall fasten each cylinder to the turntable and a 2” pin shall fasten each cylinder to the aerial ladder. The elevating cylinders shall be mounted utilizing spherical bearings on both ends of the cylinders. The cylinders shall function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders shall be provided with pilot-operated check valves to prevent movement of the ladder in case of a loss of hydraulic pressure. The elevating cylinders shall be able to raise and lower the aerial ladder to any angle from -8 degrees to +76 degrees.

The elevation system shall be designed following the current edition of NFPA 1901. The elevation cylinders shall incorporate cushions on the upper limit of travel. The elevation cylinders shall also serve as a locking device to hold the aerial in the stored position for road travel.

Rotation Mechanism

The aerial shall be supplied with a powered rotation system as outlined in the current edition of NFPA 1901. This system shall provide continuous rotation under all rated conditions and shall be supplied with a brake to prevent unintentional rotation.

Rotation shall be accomplished by a high-torque hydraulic motor driven through a spring-engaged, hydraulically-released, multiple-disc brake into a planetary gear box. The gear box shall have a minimum continuous torque rating of 60,000 in. lbs. and a minimum intermittent torque rating of 120,000 in. lbs. The turntable bearing, ring gear teeth, spur gear, planetary gear box, and output shaft shall have a minimum safety factor of 2.5 to 1.

Hydraulic Swivel

A hydraulic swivel shall be installed to provide hydraulic fluid transfer to the aerial ladder cylinders, electrical power to the aerial ladder, and water delivery to the pre-plumbed waterway while permitting continuous 360-degree rotation. The swivel shall be environmentally-sealed to prevent contamination of the hydraulic fluid. The swivel shall include a 4” passage for waterflow. The number of hydraulic ports and electrical circuits shall be dependent on the type of aerial control system as noted below:

Control System	Hydraulic Ports	Electrical Circuits
Direct hydraulic controls	8	24
Advanced Aerial Control System	5	28
Advanced Aerial Control System - Deluxe	5	36

Aerial Ladder Control Station

An aerial ladder control station shall be supplied as outlined in the current edition of NFPA 1901. The control station shall be located on the left side of the aerial turntable. The apparatus shall be supplied with labels to warn of electrocution hazard. The control console shall provide a service access door on the front and side of the console to access hydraulic and electrical connections. The electrical panel shall be contained in a junction box with labeled wires. The control console shall be angled, labeled, and supplied with lights for night operation.

Console Cover

A diamond plate contoured hinged cover shall be supplied to protect the console from the elements. The cover shall latch in the stored position and swing away from the console so as not to interfere with sight of the aerial device.

Aerial Ladder Control Levers

The control levers shall be arranged as outlined in the current edition of NFPA 1901. The first lever from the left shall be the extension control (forward for extend and back for retract). The second lever shall be the rotation control (forward for clockwise and back for counter clockwise). The third handle shall be the elevation control (forward for down and back for up). The aerial shall employ direct hydraulic controls for precise control and dependable service with minimal electrical functions. A ring around the control levers shall be provided to prevent unintentional movement.

Rung Alignment Indicator

A light on the control console shall indicate when the ladder rungs are aligned for climbing.

Aerial Ladder Alignment Indicator

A reflective arrow mounted to the body and the turntable shall indicate when the aerial ladder is aligned with the forward aerial ladder support.

Load Indication System

A lighted elevation/safe-load indicator diagram shall be located on the lower left side of the base section to indicate safe load capacity at any angle of elevation. The safe load indicator shall be 15” x 15” in size and shall clearly communicate the aerial ladder capacity in any one of the following conditions: tipload, tipload with water flowing, and distributed load at full extension. The chart shall identify capacity using graphic characters to indicate each 250 lb. increment. The chart shall be equipped with lighting and warn of electrocution hazards from power lines and lightning.

An extension indicator shall be located on the handrails of the base section to indicate feet of extension. The control pedestal shall also come equipped with a hydraulic oil pressure gauge and lights for night operation.

Aerial Waterway

One (1) 1,000 gpm pre-piped waterway shall be supplied as outlined in the current edition of NFPA 1901. The waterway shall telescope to the end of the fly section. A waterway of 4” internal diameter shall pass through the turntable and a swivel joint to connect to the tubular aerial waterway. The tubular waterway shall run under the aerial ladder. The waterway tubes shall have the following sizes:

Base Section: 4-1/2” OD
Mid Section: 4” OD
3rd Section: 3-1/2” OD

The base section shall be constructed of regular aluminum and the second and third sections of the waterway shall be constructed of hard coat anodized aluminum and shall telescopic with the aerial ladder through sealed slip joints. The slip joints shall be designed with grease zerk fittings to facilitate lubrication.

A 1-1/2” drain valve shall be installed and operated from the rear of the apparatus to drain the waterway.

The water system shall be capable of flowing 1,000 gpm at 100 psi nozzle pressure at full elevation and extension. The friction loss between the tip and below the swivel shall not exceed 100 psi while flowing 1,000 gpm as outlined in NFPA 1901.

Waterway Relief Valve

An automatic relief valve preset at 250 psi shall be installed in the aerial waterway to prevent over-pressurization of waterway system. The relief valve shall be mounted in the lower portion of the waterway where it enters the aerial torque box frame and dumps under the apparatus.

Ladder Tip Steps

Two (2) folding steps shall be located near the ladder tip to provide a position for a firefighter using the ladder pipe/monitor as outlined in the current edition of NFPA 1901. The steps shall have a raised surface for traction and cut outs for easy manual deployment. Each step shall have a minimum load rating of 500 lbs. and shall have a minimum step area of 35 sq. in.

ISO Compliance

The manufacturer shall operate a Quality Management System meeting the requirements of ISO 9001:2000.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer`s certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer`s quality systems shall consist of, but not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer`s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes shall be documented for traceability and reference. The manufacturer shall also engage the services of a certified third party for testing purposes where required.

If the manufacturer operates more than one manufacturing facility each facility must be ISO certified.

By virtue of its ISO compliance the manufacturer shall provide an apparatus that is built to exacting standards, meets the customer`s expectations, and satisfies the customer`s requirements.

A copy of the manufacturer`s certificate of ISO compliance for each manufacturing facility shall be provided with the bid.

AERIAL HYDRAULIC SYSTEM OPTIONS

Aerial Hydraulic Oil Level Gauge

A hydraulic oil level gauge shall be supplied for easy fluid level verification. The three-light system shall indicate full oil level with a green light, acceptable oil level with yellow light, and low oil level with a red light. The display shall be located on pump operator's panel.

AERIAL CONTROLS

Aerial Control System

The aerial shall employ direct hydraulic controls for precise control and dependable service with minimal electrical functions. The control valve shall be located just below the turntable console with the levers extending up through the panel.

MONITORS

1000 GPM Electric Monitor

The aerial ladder shall be equipped with an Akron style 3480 StreamMaster II electrically controlled monitor. The monitor shall be made from Akron`s unique lightweight Pyrolite construction to minimize ladder tip loads. The monitor shall be equipped with an Akron style 5177 Akromatic electrically controlled automatic nozzle capable of discharging 250-1,250 gpm at 80 psi nozzle pressure. This waterflow capability shall be available at any extension, elevation, or position without any restrictions while flowing 1,000 gpm. A minimum stability factor of 1.5 to 1 shall be maintained in this configuration.

The operational range of the electric monitor and nozzle shall be 135 degrees through the vertical plane (90 degrees upwards from a line perpendicular to the aerial ladder and 45 degrees downward), and 180 degrees through the horizontal plane (90 degrees to either side of the aerial ladder center line). The monitor shall be able to move in the horizontal and vertical axis simultaneously.

The monitor relay box shall include an electronic control system that is attached to the inlet base of the monitor and be totally encapsulated to prevent moisture intrusion. The monitor shall have fully enclosed motors and gears with built in manual override capability and quick-attach

handles. A battery, which continuously charges from the vehicle power system shall provide power for monitor movement. Systems which do not utilize a battery shall not be acceptable due to the higher incidence of failure with this type of system. **NO EXCEPTIONS.**

Control switches for horizontal movement, vertical movement and pattern selection shall be located at the control panel.

Monitor Tip Controls

In addition to the controls at the operator console, electric monitor directional and stream controls shall be installed in close proximity to the monitor on the ladder to allow operation by a firefighter on the ladder.

AERIAL WARNING LIGHTS

LED Outrigger Lights (PR)

Two (2) Truck-Lite model 91 LED outrigger warning lights with red lenses shall be provided.

The lights shall be surface mounted on the outrigger covers in compliance with current NFPA 1901.

AERIAL LIGHTING

Ladder Base Lighting

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear cover shall be mounted one on each side at the bottom of the ladder base section. They shall be controlled from the turntable operating pedestal.

LED 12V Flood Light

A Whelen Micro Pioneer 12V LED flood light model MPPWCS shall be provided on a low profile pedestal mount.

The lighthead shall incorporate 12 white Super-LEDs installed in a white powder coated die-cast aluminum housing with a chrome finish polycarbonate cover. The light fixture shall measure 5" wide by 8.69" high by 3.25" deep. The 45W LED light head shall be rated at 4,100 usable Lumens that draws 3.5 amps. The light shall have a black fiberglass reinforced polycarbonate handle.

The low profile pedestal mount shall consist of a cast stainless steel pedestal base with cast stainless steel swivel mount stud, pivot, and hinge assembly.

The light head shall be provided with a weather-resistant on/off switch as well as a switch at the lower console to control the light when the aerial power circuit is activated.

The light assembly shall be mounted at the tip of the aerial as specified.

Location(s): left side tip.

WATERWAY OPTIONS

Pinned Waterway Upgrade

A remote-controlled monitor/nozzle assembly shall be attached to a ladder fly section through C-channel slide pads which shall allow the monitor/nozzle assembly to be positioned at the tip of a section for maximum master stream reach or at the tip of the next section down for unobstructed rescue capabilities. The monitor/ nozzle assembly shall be pinned at either operating location with a single stainless steel ”T” handle locking ball pin. A monitor control station shall be attached to the sliding monitor/nozzle assembly and shall move with it.

The turntable monitor controls shall be connected to the sliding monitor system using an electronic multiplexing system that sends all monitor control signals over a shielded pair of wires through a spring retract electric cable reel. The collector rings in the cable reel shall be specifically designed for accurate transmission of electronic signals.

A gel-cell rechargeable battery shall be located on the sliding monitor assembly. A dedicated ground wire and 12VDC positive charging wire shall be routed from the turntable control station through the electric cable reel to the monitor battery. The charging wire shall be directly connected to the chassis 12VDC battery system through a 20 amp auto reset circuit breaker.

The moveable monitor/nozzle assembly shall be capable of flowing from 300 gpm to 1000 gpm while maintaining a constant 80-100 psi nozzle pressure for maximum stream projection.

Waterway Inlet

One (1) 4” inlet shall be provided at the rear of the apparatus and shall be connected to the vertical pedestal waterway piping to supply water to the aerial waterway from an outside source. All fabricated piping shall be constructed of a minimum of Schedule 10 stainless steel piping to help prevent corrosion. The threads shall be NST. A long handle chrome plated 4” NST cap shall be installed on the inlet.

Flowminder

The aerial shall be equipped with one (1) Class 1 brand Flowminder for the aerial waterway to digitally display the actual volume of water being discharged in gallons per minute and the total volume of water that has flowed through the waterway.

The readout shall be mounted at the turntable control station.

The Flowminder shall consist of:

• Weatherproof digital flow display with super-bright digits at least 1/2” (0.5”) high. The display shall read actual flow and shall switch to total flow when the totalizer button is depressed and held.
• Flow transmitter mounted in the aerial waterway pipe above the swivel. The transmitter shall consist of a weather-resistant black-anodized housing with brass wetted parts with a double paddle wheel.
• Connecting cables to connect the digital display to the flow transmitter and apparatus power.
• Machined mounting hardware to hold the transmitter in position in the discharge line.

The flow meter shall be checked and calibrated prior to delivery of the apparatus.

Waterway Pressure Gauge

The valve discharge gauges shall be 2 ½“(63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F.
Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.
A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels.
The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

AERIAL EQUIPMENT

Hand Rail Extensions

Two (2) tubular steel hand rail extensions, each with an anti-slip finish, shall be installed on the on the right and left sides of the turntable platform hand rails. The rails shall extend from the rear of the vertical hand rails and shall not interfere with the operational envelope of the ladder.

SIGN PLATES

Aerial Sign Plate

Two (2) 10” x 144” x 1/8” (0.125”) thick smooth aluminum plates shall be provided. The plates shall have 1” lips top and bottom for rigidity. Each sign plate shall be bolted on either side of the base section, approximately at the midpoint. The plates shall be provided to display the department`s name or other information. The plates shall be painted FLNA4006 White as specified by the customer.

AERIAL TESTING

Third-Party Flow Test

A flow test shall be conducted to determine that the water system is capable of flowing 1,000 gpm at 100 psi nozzle pressure with the aerial device at full extension and elevation. When the aerial apparatus is equipped with a fire pump, the test shall be conducted using the onboard pump. Intake pressure for the onboard pump shall not exceed 20 psi.

In addition to the flow test, a hydrostatic test shall be done on the waterway system. The permanent water system, piping, and monitor shall be hydrostatically tested at the maximum operating pressure required to flow 1,000 gpm at 100 psi nozzle pressure at maximum elevation and extension.

These results shall be certified by an independent, third-party testing organization, per NFPA 16.13.1 through 16.13.1.3.

Aerial Certification

All certification shall be performed by a certification organization that is accredited for inspection and testing systems on fire apparatus in accordance with ISO/IEC 17020.

The aerial ladder shall be tested in compliance with the current editions of NFPA 1901 and NFPA 1911. All critical structural components of the aerial shall include 100% nondestructive testing (NDT) before assembly and body mounting. All NDT testing shall be performed by Level II or Level III technicians who have been certified in the test methods used in accordance with ANSI/ASNT CP-189.

Welds for structural load-supporting elements shall be performed by certified welders under the guidelines of AWS. Each aluminum ladder section shall be subjected to 100% NDT visual weld inspection followed by Liquid Penetrant NDT inspection as required to qualify suspected weld defect indications. Each steel ladder section shall be subjected to 100% Magnetic Particle NDT weld inspection to assure the structural integrity of the welds.

A 100% Magnetic Particle weld inspection shall be conducted on the torque box, aerial support structure, outriggers, outrigger support structure and all other structural ferrous aerial components. This test shall be performed to assure the structural integrity of the weldment.

After the aerial is assembled and installed on the vehicle, an operational inspection shall be made and the aerial shall be tested to comply with the applicable standards in the current editions of NFPA 1901 and NFPA 1911.

In addition to the above tests, the aerial shall successfully complete the following operational tests:

1) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial shall lift a test weight equal to the rated tip load capacity, as specified herein, with the aerial at full extension, 0 degrees elevation, and rotated 90 degrees to either side of the truck chassis. The test weight shall be lifted from 0 degrees to 15-20 degrees. The test weight shall be suspended from a position equal to the position of the outermost rung of the fly section or the center of the platform when so equipped. The aerial shall lift the test weight smoothly and evenly with no twisting or jerking. This test shall be performed at the normal hydraulic system relief valve setting. No temporary adjustments to the relief valve shall be allowed.

2) The completed apparatus shall be placed on a firm, level surface with the aerial ladder stabilizers extended and down. A test weight equal to 1.5 times the aerial`s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated a full 360 degrees around the vehicle with the aerial at full extension and at 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

3) The completed apparatus shall be placed on a firm surface having a minimum 5 degrees side slope with the aerial stabilizers extended and down. A test weight equal to 1.5 times the aerial`s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated 90 degrees to the downhill side with the aerial at full extension, 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability, and all of the stabilizers shall remain firmly on the ground. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

4) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. A test weight equal to 2.0 times the aerial`s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center

of the platform when so equipped), with the aerial in the straight-ahead position at full extension and at 8 degrees elevation (or high enough to clear vehicle-mounted equipment). After ten (10) minutes, the weight shall be removed, and the aerial shall be inspected for any abnormal twist or deflection.

5) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial will be positioned at full extension at 0 degrees elevation at some position out of the travel rest and off the side or rear of the truck. For units without a pre-piped waterway to the tip, a test weight of 220# shall be applied horizontally and perpendicular to the tip of the aerial at the location of the outermost rung. The rotation brake shall not release nor shall the aerial`s deflection exceed the manufacturer`s accepted tolerances. For aerials with pre-piped waterways, a test weight of 350# will be applied at the location of water nozzle.

Upon satisfactory completion of all inspections and tests, an independent third-party inspection firm shall submit a certificate indicating that all specified standards have been met.

HOSE / NOZZLES

Soft Suction Hose with Chrome Coupling [Qty: 2]

A 15` soft suction hose with 6” female NST long handle chrome couplings on each end shall be supplied.

GROUND LADDERS

Alco-Lite Folding Ladder

One (1) Alco-Lite FL-10, 10` aluminum folding ladder shall be provided. Both ends shall be equipped with molded rubber end caps and the ladder shall have handles for easy carrying. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite Roof Ladder [Qty: 2]

An Alco-Lite PRL-16, 16` aluminum roof ladder shall be provided. A pair of folding 3/4” (0.75”) steel roof hooks shall be attached to one end of the ladder, and a pair of steel spiked feet on the other end. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite Extension Ladder

One (1) Alco-Lite PEL-24, 24` aluminum 2-section extension ladder shall be provided. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite 3-Section Extension Ladder

One (1) Alco-Lite PEL3-35, 35` aluminum 3-section extension ladder shall be provided. The fly section shall be operated by a cable and shall automatically extend as the center section is raised. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

MISC LOOSE EQUIPMENT

DOT Required Drive Away Kit

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

EXTERIOR PAINT

Painted Pump/Pre-Connect Module(s)

The apparatus pump/pre-connect module(s) shall be painted job color.

The paint process shall match what is applied to the body.

Paint Custom Cab

The apparatus cab shall be painted Sikkens FLNA3225E-1 Red. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces. Cab doors and any hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on cab, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.

- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Paint Body Large

The apparatus body shall be painted Sikkens FLNA3225E-1 Red. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Aerial Paint

The lift cylinders, extension cylinders and upper turntable steelwork (less turntable) shall be painted FLNA4006 white.

INTERIOR PAINT

Cab Interior Paint

The interior of the cab shall be painted Zolatone gray #20-64. Prior to painting, all exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

STRIPING

Reflective Tape on Stabilizers

The two aerial ladder stabilizers which protrude beyond the side of the body shall be striped with white reflective tape. The tape shall be visible from the front and rear of the unit.

Reflective Stripe in Rubrail

The reflective stripe in the body rubrail shall be white.

Cab and Body Stripe

A single straight Scotchlite stripe, upto 6 inches in width shall be installed on the cab and body.

The stripe shall be NFPA compliant and the size, color and location shall be as specified by the customer.

Rear Body Scotchlite Striping

Printed chevron style Scotchlite striping shall be provided on the rear of the apparatus. The stripes shall consist of 6” Red/Lemon Yellow alternating stripes in an ”A” pattern. The striping shall be located on the rear facing extrusions, panels, doors and inboard/outboard of the beavertails if applicable.

Designated Standing / Walking Area Indication

1" wide yellow perimeter marking consisting of individual Reflexite diamonds shall be applied to indicate the outside edge of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.

GRAPHICS

Graphics Drawing

A graphics drawing shall be provided for the apparatus. The drawing shall include striping, lettering and logos meeting NFPA guidelines. The drawing shall be presented for review and approval by the end user prior to application of the graphics.

WARRANTY / STANDARD & EXTENDED

Standard 1 Year Warranty

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

Lifetime Frame Warranty

The apparatus manufacturer shall provide a full lifetime frame structural warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross-members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle shall not be acceptable.

10 Year 100,000 Mile Structural Warranty

The apparatus manufacturer shall provide a comprehensive 10 year/100,000 mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

10 Year Stainless Steel Plumbing Warranty

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

20 Year Aerial Device Structural Warranty

The aerial manufacturer shall provide a 20 year structural integrity warranty on the aerial device. This warranty shall cover structural components and shall be extended for a period of 20 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document shall be provided with the proposal. Please refer to warranty document for complete details and exclusions.

10 Year Paint and Corrosion Warranty

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

Topcoat & Appearance:
(Gloss, Color Retention, Cracking)
0 to 72 months 100%
73 to 120 months 50%

Coating System, Adhesion & Corrosion:
(Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling)
0 to 36 months 100%
37 to 84 months 50%
85 to 120 months 25%

Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.

25 Year Frame Rail Corrosion Warranty

The chassis manufacturer shall provide a 25 year corrosion warranty on the chassis frame rails. This warranty shall cover the chassis frame rails, including frame rail liners (if equipped), for a period of 25 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document shall be provided with the proposal. Please refer to warranty document for complete details and exclusions.

Meritor Front Axle Warranty

A 5-year/unlimited miles, 5-year parts and 5-year labor **front non-drive steer** axle warranty shall be provided by Meritor Automotive or a 2-year/unlimited miles, 2-year parts and 2-year labor **front drive steer** axle warranty shall be provided by Meritor Automotive.

Meritor Rear Axle Warranty

A 5-year/unlimited miles, 5-year parts and 5-year labor rear drive single or rear drive tandem axle warranty shall be provided by Meritor Automotive.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

Training

The manufacturer shall provide three (3) days of training covering vehicle maintenance and operational familiarization.

This training shall be provided by a full time, manufacturer employee trainer who specializes in aerial training.

Pump Panel Approval Drawing

A detailed large scale approval drawing of the pump panel(s) shall be provided. The drawing shall be provided on an purchased unit prior to the construction process.

Approval Drawings

A general arrangement drawing depicting the vehicles appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views.

Vehicles requiring pump controls shall include a general arrangement view of the pump operator`s position, scaled the same as the elevation views.

Approval Drawings - Dash Panel Layout

A detailed large scale approval drawing of the dash/console panel layout shall be provided. The drawing shall be provided on an purchased unit prior to the construction process.

Electronic Manuals

Two (2) copies of all operator, service, and parts manuals MUST be supplied at the time of delivery in digital format -NO EXCEPTIONS! The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The electronic document shall incorporate a navigation page with electronic links to the operator`s manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer`s location.

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.

Operator and Service Manual Additional

Electronic Manuals

One additional operator, service, and parts manuals will be provided in digital format.

Note: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.

Fire Apparatus Safety Guide

Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is NOT a substitute for the E-ONE`s fire apparatus operator and maintenance manuals or commercial chassis manufacturer`s operator and maintenance manuals.

Cubic Feet Worksheet
Quote # 90139 - Spec #9

Compartment	Width	Height	Depth	Total
L1/R1 Upper	24	35	12	11.66667
L1/R1 Lower	24	26	26	18.77778
L2/R2 Upper	34	35	12	16.52778
L2/R2 Lower	34	26	26	26.60185
L3/L4	40	35	12	19.44444
R3/R4	40	35	12	19.44444
L5/R5 Upper	32	35	12	15.55556
L5/R5 Lower	32	26	26	25.03704
				153.0556