# PROPOSAL

**TO THE:**
City of Columbus, Ohio
Purchasing Office
77 North Front Street 523
Columbus, OH 43215

**DATE:** April 1, 2025

We hereby propose and agree to furnish the following firefighting equipment upon your acceptance of this Proposal:

**One (1) Sutphen Heavy Duty 100' Mid-Mount Aerial Ladder (SPH-100) Equipped Complete and Delivered for the Total Sum of $ 2,515,613.00 in accordance with the Ohio State Term Schedule, Contract #STS023111.**

The apparatus and equipment being purchased hereunder shall be completed within approximately **12-14** months after the Sutphen's receipt and approval of Purchaser's acceptance of this Proposal.

This Proposal shall be valid for (30 Days). If a Purchase Agreement or Purchase Order is not received by Sutphen in (30 Days), the date of this Proposal, Sutphen reserves the right to extend, withdraw, or modify this Proposal, including pricing, delivery times, and prepayment discounts, as applicable.

Respectfully submitted,

Harrison Sutphen

Harry B. Sutphen
Authorized Representative for Sutphen Corporation
(740)-819-5440

**TERMS & CONDITIONS**

Changes to National Fire Protection Association ("NFPA") 1900, Environmental Protection Agency ("EPA") or changes legislated by Federal, State or Local Governments that impact the cost to manufacture the truck may incur additional charges which shall be borne by the Purchaser. These may include but are not limited to changes that affect the major vendors of the fire apparatus industry such as pump manufacturers, seat manufacturers, electrical power supplies (generators) and powertrain (engine & transmission). Any such changes shall be documented on a change order executed by both Sutphen and Purchaser.

Sutphen shall provide written notice to the Purchaser as soon as it reasonably believes any cost increase provision may be invoked. Sutphen shall provide, upon written request, documentation of such changes and increases.

Sutphen will use its reasonable best efforts to deliver the apparatus within the timeframe quoted herein, provided that such delivery date shall be automatically extended for delays beyond Sutphen's control, including, without limitation, strikes, labor disputes, riots, civil unrest, pandemics, war or other military actions, sabotage, government regulations or controls, fire or other casualty, or inability to obtain materials or services. If such delay occurs, Sutphen shall give notice of delay to Purchaser. Purchaser shall not be entitled to any discount or reduction in price for such delay and Sutphen shall not be liable for any damages (compensatory, incidental, consequential or otherwise) related to such delay.

Final payment shall be made at the time of final inspection at the factory. Should payment be delayed, Sutphen reserves the right to charge interest at the rate of one and one-half percent (1.5%) per month, beginning on the day after payment is due.

Delivery, payment, and transfer of the Manufacturer's Certificate of Origin (MCO) shall take place at Sutphen during final inspection, and upon payment in full in accordance with these terms. Sutphen reserves the right to withhold delivery of the MCO until payment in full is received. If Purchaser requires any third-party equipment mounting, the apparatus shall be moved to the third-party facility by the dealer or Purchaser for such mounting. Such third-party work shall not delay or offset payment to Sutphen. The apparatus shall be tested per NFPA #1900 at Sutphen's manufacturing facility. Purchaser agrees that the apparatus and equipment being purchased hereunder shall not be driven or used in any manner until it is paid for in full. In the event there are any shortages or omissions with the apparatus at time of completion, Purchaser may withhold a sum equivalent to the price of any such shortages as determined by Sutphen.

In the case of any default in payment hereunder or in the payment on any notes, negotiable paper, obligations or other instruments issued by Purchaser, Sutphen may take full possession of the apparatus and equipment or of the piece or pieces upon which default has been made, and any payments that have been made theretofore shall be applied as rent in full for the use of the apparatus and equipment up to the date of taking possession by Sutphen.

Sutphen warrants to Purchaser that all goods and services furnished hereunder will conform in all respects to the terms of this order, including any applicable change orders, drawings, specifications, or standards incorporated herein, and/or shall be free of defects in materials, workmanship, and free from such defects in design. In addition, Sutphen warrants that the goods and services are suitable for and will perform in accordance with the purposes for which they were intended, for a period of one year from the Warranty Registration Date, unless an extended warranty is purchased.

The purchase price provided for herein does not include any federal, state or local sales tax, duties, imposts, revenues, excise or other taxes which may hereafter be imposed by governmental authority or otherwise and which are made applicable to the apparatus or equipment covered by this Proposal. In the event that any such taxes are subsequently imposed and become applicable, the purchase price herein shall be increased by the amount of such taxes and such sum shall be immediately paid by Purchaser to Sutphen. To the extent applicable, the prices and deliveries set forth herein are subject to the Defense Production Act.

Sutphen shall provide insurance insuring the apparatus and equipment against loss by fire, theft, or collision and insuring against property damage and personal injury through the completion of the apparatus and transfer of the Manufacturer's Certificate of Origin.

After the execution of this Agreement, Purchaser shall have no right to terminate the Agreement. Sutphen may, in its absolute and sole discretion, accept Purchaser's request to terminate the Agreement. In the event Sutphen accepts Purchaser's request to terminate the Agreement, Sutphen may charge a cancellation fee. The following charge schedule based on costs incurred may be applied, at Sutphen's sole discretion:(a) 10% after order is accepted by Sutphen; (b) 30% of the Purchase Price after production has commenced. The cancellation fee may increase accordingly as costs are incurred as the order progresses through engineering and into manufacturing.

These Terms and Conditions ("T&C") contained in the Proposal provided herein take precedence over all previous negotiations, oral or written, and no representations or warranties are applicable except as specifically contained in these or in any subsequently signed agreement between the Parties. No waiver of any of the provisions of these T&C shall be deemed a waiver of any other provision, whether similar, nor shall any waiver constitute a continuing waiver. If a Purchase Order is issued, this Proposal, including the Terms and Conditions contained herein, shall supersede the terms in the Purchase Order where terms may be inconsistent.

This Proposal shall be governed and controlled as to interpretation, enforcement, validity, construction, effect and in all other respects by the laws, statutes, and decisions of the State of Ohio. Exclusive jurisdiction and venue for any litigation at all related to this in the Franklin County Court of Common Pleas, Columbus, Ohio, and the parties hereto consent and submit to the general jurisdiction of this court. All of these T&C shall be binding upon and inure to the benefit of and be enforceable by Sutphen, Purchaser, their successors and assigns.

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| **Sutphen**<br>**Component Report**<br>**Dealership: Heritage Fire Equipment** | **HS- Columbus Division of Fire, Ohio**<br>**SPH100 Aerial Platform** |

| Bill To | Ship To |
|---|---|
| Customer: Columbus Division of Fire<br><br>Columbus, Ohio 43762 | Customer: Columbus FLEET<br><br>Columbus, Ohio 43762 |

**Quote Line Number 1**

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 1 | 10000225 | 1 | STD WIRING SCHEMATIC (USB) |
| 2 | 10310100 | 1 | CHASSIS |
| | | | **CHASSIS** |
| 3 | 10010006 | 1 | CHASSIS, CUSTOM |
| 4 | 51070247 | 1 | WHEELBASE = 247 |
| 5 | 25020120 | 1 | FRAME, 10" DOUBLE RAILS, DOMEX, TANDEM AXLE - AERIAL (110K PSI) |
| 6 | 45040100 | 1 | FRONT BUMPER CLIP |
| 7 | 45010001 | 1 | FRONT TOW EYES, BELOW BUMPER, PAINTED |
| 8 | 46010000 | 1 | REAR TOW EYES, PAINTED |
| 9 | 40010250 | 1 | STEERING - ROSS TAS-85 |
| 10 | 22010250 | 1 | DRIVE LINE, SPICER, SPL250 (Tandem) |
| 11 | 23015200 | 1 | ENGINE, CUMMINS X15 NEXT GEN 500HP DOC-DPF-DEF-SCR OBD |
| 12 | 23029200 | 1 | ENGINE WARRANTY, 5 YEAR, 100,000 MILES FOR CUMMINS (X SERIES) |
| 13 | 23029400 | 1 | AFTERTREATMENT WARRANTY, 5 YEAR, 100,000 MILES FOR CUMMINS (X SERIES) |
| 14 | 23030006 | 1 | AIR INTAKE/EMBER SEPARATOR |
| 15 | 23031176 | 1 | FUEL FILTER/WATER SEPARATOR, PRIMARY, FLEETGUARD FUEL PRO FH230 |
| 16 | 23031180 | 1 | 12VDC HEATER FOR FLEETGUARD FUEL/WATER SEPARATOR |
| 17 | 23031220 | 1 | FUEL FILTER, SECONDARY, FLEETGUARD, FF5825NN |

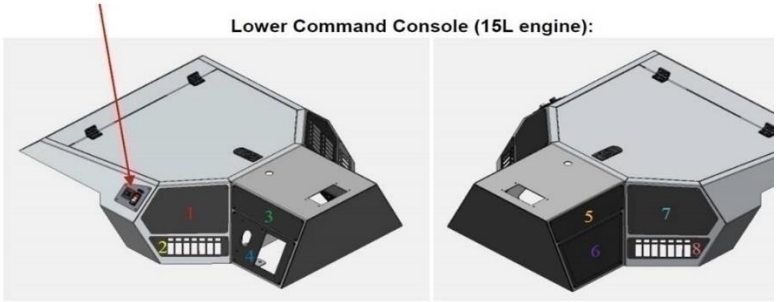
| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 18 | 47012530 | 1 | TRANSMISSION, ALLISON GEN 6, EVS4500 (X10HHD, X12, X15) |
| 19 | 23110000 | 1 | JACOBS ENGINE BRAKE |
| 20 | 47024050 | 1 | TRANSMISSION COOLER |
| 21 | 47030000 | 1 | ALLISON TOUCH PAD SHIFTER |
| 22 | 47030110 | 1 | SHIFTER PAD GEARING, 6 GEARS OPEN |
| 23 | 21021210 | 1 | COOLING SYSTEM FOR X15 |
| 24 | 21030195 | 1 | COOLANT FILTER |
| 25 | 21030000 | 1 | FAN CLUTCH |
| 26 | 21030200 | 1 | RADIATOR COOLANT RECOVERY, PRESSURIZED SYST |
| 27 | 26020100 | 1 | FUEL BEAM, 65 GALLON (AERIALS) |
| 28 | 26030055 | 1 | DUAL FUEL FILL (FUEL BEAM) |
| 29 | 26030100 | 1 | FUEL COOLER |
| 30 | 24040000 | 1 | DIESEL EXHAUST FLUID TANK |
| 31 | 13012550 | 1 | ALTERNATOR, DELCO-REMY 430 AMP 55SI |
| 32 | 13030100 | 1 | LOW VOLTAGE ALARM, FLOYD BELL TXB-V86-515-QF |
| 33 | 15010500 | 1 | BATTERIES, INTERSTATE TYPE 31 MHD (4) |
| 34 | 15031700 | 1 | BATTERY JUMPER TERMINALS |
| 35 | 15031577 | 1 | BATTERY CHARGER, IOTA DLS-45 |
| 36 | 15088888 | 1 | KUSSMAUL PUMP PLUS STATUS CENTER DISPLAY, 091-198-12-PP |
| 37 | 15088888 | 1 | STAINLESS PLATE BEHIND KUSSMAUL EJECT INLETS |
| 38 | 15088888 | 1 | MAGNETIC EXAHUST ADAPTER FOR PLYMOVENT GRABBER SYSTEM |
| 39 | 14022140 | 1 | FRONT AXLE, HENDRICKSON STEERTEK NXT 24,000 LB. |
| 40 | 41022140 | 1 | FRONT SUSPENSION, HENDRICKSON 24,000 LBS. (4) 56" LEAFS |
| 41 | 41040100 | 1 | FRONT SUSPENSION LOCKING CYLINDERS, AERIALS |
| 42 | 41040200 | 1 | FRONT SUSPENSION LOCKOUT PLATE |
| 43 | 41040510 | 1 | STEER ASSIST |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 44 | 43010322 | 1 | FRONT TIRES, GOODYEAR, 425/65R22.5 LRL, ARMOR MAX PRO GRADE MSA 22.5 X 12.25 WHEELS |
| 45 | 14520310 | 1 | REAR AXLE, MERITOR RT-50-180 52,000 LB TANDEM |
| 46 | 14530150 | 1 | TOP SPEED, 60 MPH |
| 47 | 14530316 | 1 | DRIVER CONTROLLED INTER-AXLE (FRONT-TO-REAR) DIFFERENTIAL LOCK (TANDEM) |
| 48 | 42020025 | 1 | REAR SUSPENSION, LINK, AIR LIFT, 52,000 LBS. AIR RIDE |
| 49 | 44020285 | 1 | REAR TIRES, GOODYEAR 12R22.5 LRH G622 MUD & SNOW 52,000 GVWR |
| 50 | 42920000 | 1 | TIRE PRESSURE MONITOR, CROSSFIRE REAR, REAL WHEELS LED FRONT |
| 51 | 44220110 | 1 | WHEELS, ALUM, ACCURIDE, ACCUSHIELD (max 58K rear) |
| 52 | 44270105 | 1 | HUB COVERS, FRONT & REAR, POLISHED STS (Tandem Axle) |
| 53 | 44270305 | 1 | CHROME LUG NUT CAPS, FRONT & REAR (Tandem Axle) |
| 54 | 44271100 | 1 | MUD FLAPS, FRONT (PAIR) |
| 55 | 44271200 | 1 | MUD FLAPS, REAR (PAIR) |
| 56 | 54010010 | 1 | DATA, SAFETY & WARNING TAGS APPLICATION, ADHESIVE |
| 57 | 16010295 | 1 | BRAKES STEERTEK DISC PLUS EX225 FRONT, SCAM 8.625" REAR (TANDEM AXLE) |
| 58 | 18030000 | 1 | GUARD OVER PARKING BRAKE KNOB |
| 59 | 18010046 | 1 | AIR BRAKE SYSTEM 6 TANKS WABCO 1200 DRYER (TANDEM) |
| 60 | 18030015 | 1 | AIR BRAKE RELEASE VALVE, HALDEX |
| 61 | 18010049 | 1 | AUTOMATIC HEATED MOISTURE EJECTORS W/MANUAL PULL CABLE (TANDEM) |
| 62 | 18030140 | 1 | AIR INLET CONNECTION W/CHECK VALVE |
| 63 | 18220000 | 1 | ELEC STABILITY CONTROL SYST (TANDEM) |
| 64 | 18110150 | 1 | WABCO 6 CHANNEL ANTI-LOCK BRAKES W/ASR (TANDEM) |
| 65 | 18142000 | 1 | ASR DISCONNECT SWITCH ON DASH |
| 66 | 54010200 | 1 | AERIAL CHASSIS PREP (TANDEM AXLE) |
| 67 | 53510000 | 1 | COMPRESSION FITTINGS ON AIR SYSTEM (CHASSIS) |
| 68 | 54010000 | 1 | MISCELLANEOUS ITEMS ON CHASSIS |
| 69 | 10310110 | 1 | CAB |
| CAB | | | |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 70 | 11024240 | 1 | CAB TSAL4SD 73" FLAT |
| 71 | 11030025 | 1 | CAB CERTIFICATION - STRUCTURAL INTEGRITY |
| 72 | 11030960 | 1 | CAB LOCKDOWN LATCHES W/INTERLOCK & INDICATOR LIGHT |
| 73 | 11031025 | 1 | CAB TILT SYSTEM, AIR CONTROL VALVE |
| 74 | 11031030 | 1 | CAB TILT CONTROL LOCATION, OFFICER'S SIDE PUMP PANEL |
| 75 | 11031100 | 1 | MANUAL BACK-UP TILT SYSTEM |
| 76 | 11031355 | 1 | CAB DOORS, BARRIER STYLE (4) |
| 77 | 11031367 | 1 | LOWER CAB STEP WELLS, RAPTOR (TRUCK COLOR) & TREADPLATE BACK WALL & SIDE WALLS (EA) (4) |
| 78 | 11031385 | 1 | CAB STEPS, LOWER GRIP STRUT, INTERMEDIATE DIAMONDPLATE |
| 79 | 11031390 | 1 | AUXILIARY CAB STEPS, ALUM, GRIP STRUT (SET OF 4) |
| 80 | 11031399 | 1 | CAB STEP LIGHTING, TECNIQ E45 LED STRIP LIGHTS |
| 81 | 11031421 | 1 | CAB DOOR WINDOWS, POWER (4) |
| 82 | 11031401 | 1 | CAB SIDE WINDOWS, FIXED, BOTH SIDES |
| 83 | 11031460 | 1 | NO WINDOWS, BACK WALL OF CAB |
| 84 | 52010010 | 1 | ELECTRIC INTERMITTENT WIPERS |
| 85 | 52030200 | 1 | WINDSHIELD WASHER RESERVOIR |
| 86 | 38010020 | 1 | MIRRORS LANG MEKRA 300 SERIES HEATED & REMOTE |
| 87 | 38030205 | 1 | BLIND SPOT MIRROR, VELVAC, ON CAB ROOF |
| 88 | 38030210 | 1 | OFFICER'S SIDE OUTRIGGER MIRROR, REAR EXTERIOR WALL OF CAB, 12" CONVEX, TRUCK-LITE |
| 89 | 11024405 | 1 | UPPER GRILLE, LEVEL STYLE FACADE (X SERIES) |
| 90 | 11024510 | 1 | FLAMING "S" LOGO, UPPER GRILLE, ILLUMINATED |
| 91 | 11024605 | 1 | LOWER GRILLE, POLISHED STAINLESS (X SERIES) |
| 92 | 32588888 | 1 | PRO TEC, CAB EXTERIOR COMPT VERTICAL EDGES |
| 93 | 32588888 | 1 | RUBBER WHEEL TRIM FENDERETTES FRONT AND REAR AXLES |
| 94 | 20012200 | 1 | BUMPER, 12" FORMED STEEL CHANNEL, PAINTED |
| 95 | 20029830 | 1 | BUMPER SIDES, PAINTED STEEL, W/POCKET (12-24" EXTENSION) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 96 | 20029910 | 1 | BUMPER ANGLES, PAINTED STEEL, FLAT (12-30" EXTENSION) |
| 97 | 20042140 | 1 | PROTECTIVE BUMPER COATING, RAPTOR, TOP EDGE OF FRONT BUMPER |
| 98 | 20088888 | 1 | BUMPER NOTCH FOR RECESS OF FEDERAL Q2B DRIVER SIDE |
| 99 | 12010520 | 1 | AIR HORNS, DUAL, GROVER #1512 ROUND, 21", THRU BUMPER |
| 100 | 12030205 | 1 | AIR HORNS WIRED TO STEERING WHEEL BUTTON |
| 101 | 12030350 | 1 | LANYARD CONTROL FOR AIR HORNS |
| 102 | 12510109 | 1 | ELEC SIREN, WHELEN 295HFSA7, REMOTE FLUSH MOUNT WITH REMOVABLE MIC |
| 103 | 12620202 | 1 | SIREN SPEAKER, 100W, WHELEN, SA314B, BLACK FINISH (PAIR) |
| 104 | 12670120 | 1 | SIREN SPEAKER(S) INSTALLED IN BUMPER BEHIND PERFORATIONS |
| 105 | 12710300 | 1 | SIREN, FEDERAL Q2B, FRONT BUMPER MOUNT |
| 106 | 12730305 | 1 | FOOT SWITCH, DRIVER'S SIDE, FOR MECH SIREN |
| 107 | 12730350 | 1 | MOMENTARY SWITCH ON DASH, OFFICER'S SIDE, FOR MECH SIREN |
| 108 | 12730363 | 1 | SIREN BRAKE SWITCH FOR MECH SIREN, DRIVER'S & OFFICER'S SIDE |
| 109 | 32520520 | 1 | HEADLIGHTS, LED, FIRETECH FT-4X6, DUAL STS HOUSINGS (MIXED UPPER WARNING & TURN SIGNAL) |
| 110 | 48010300 | 1 | FRONT TURN SIGNALS, WHELEN 400 SERIES LED (4) (MIXED HOUSING) |
| 111 | 32530630 | 1 | CORNERING LIGHTS, WHELEN M6 LED |
| 112 | 32530750 | 1 | ICC LIGHTS, LED, ROOF MOUNTED MARKERS, GROTE |
| 113 | 27022120 | 1 | HANDRAILS, CAB EXTERIOR, KNURLED STAINLESS STEEL (4) SIDE |
| 114 | 27030500 | 1 | SCUFF PLATES, SIDE OF CAB, BEHIND HANDRAILS, MIRRORED STS (4) |
| 115 | 27030625 | 1 | COAT HOOKS ON LOWER GRAB HANDRAILS, DRIVER'S SIDE (2) |
| 116 | 27030665 | 1 | COAT HOOKS ON LOWER GRAB HANDRAILS, OFFICER'S SIDE (2) |
| 117 | 27030710 | 1 | HANDRAILS, FRONT OF CAB, KNURLED STAINLESS STEEL (PAIR) |
| 118 | 27025000 | 1 | HANDRAILS, CAB INTERIOR, BLACK RUBBER COATED (2) FRONT ENTRY |
| 119 | 27030120 | 1 | HANDRAILS, REAR CAB INTERIOR DOOR, BLACK RUBBERIZED (2) AND KNURLED STS AT WINDOW (2) |
| 120 | 27040100 | 1 | INTERIOR DOOR, NYLON STRAP (FRONT & REAR CAB DOORS) |
| 121 | 11035405 | 1 | DIAMONDPLATE REAR EXTERIOR WALL OF CAB (AERIAL OR TOP MOUNT) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 122 | 11031930 | 1 | EXTERIOR DOOR, HINGED, PAINTED |
| 123 | 11032610 | 1 | DRIVER SIDE, LEFT DOOR HINGE (OPEN TOWARDS FRONT OF CAB) |
| 124 | 11033202 | 1 | 3/16" SMOOTH ALUM BACK WALL & SIDE WALLS, INSIDE CAB |
| 125 | 11033250 | 1 | UNDERCOATING, INTERIOR CAB DOORS |
| 126 | 11032010 | 1 | EXTERIOR COMPT, SIDE OF EXT CAB, 38" H, DS |
| 127 | 11032450 | 1 | COMPT DOOR LOCK - NOT PROVIDED |
| 128 | 11032060 | 1 | EXTERIOR COMPT, SIDE OF EXT CAB, 38" H, OS |
| 129 | 11032450 | 1 | COMPT DOOR LOCK - NOT PROVIDED |
| 130 | 11032110 | 1 | OPENING TO DRIVER'S SIDE CREW SEAT COMPT |
| 131 | 11032100 | 1 | NO OPENING TO CREW SEAT COMPT |
| 132 | 11032300 | 1 | PIKE POLE STORAGE, EXTERIOR CAB COMPT (BACK WALL) |
| 133 | 11035422 | 1 | DIAMONDPLATE CAB ROOF 56" x FULL WIDTH |
| 134 | 31010285 | 1 | INTERIOR, MULTISPEC BLACK SPECKLE PAINT W/GRAY-BLACK DURAWEAR |
| 135 | 11032929 | 1 | DOOR PANEL, FULL STS |
| 136 | 90600310 | 1 | REFLECTIVE MATERIAL, INTERIOR CAB DOORS, CHEVRONS, SCOTCHLITE, FULL LOWER PANEL |
| 137 | 31010291 | 1 | CAB INTERIOR FLOOR COVERING, BLACK RUBBERIZED |
| 138 | 11035375 | 1 | DIAMONDPLATE CAB FLOOR |
| 139 | 22510100 | 1 | ENGINE ENCLOSURE, FULL LENGTH |
| 140 | 22510530 | 1 | ENGINE ENCLOSURE COVERING, SCORPION BLACK URETHANE BLEND |
| 141 | 11031550 | 1 | CENTER CONSOLE EXTENSION |
| 142 | 11031560 | 1 | TOP OF EXTENSION, FLAT SURFACE |
| 143 | 11031570 | 1 | SIDES OF EXTENSION, FLAT |
| 144 | 22610050 | 1 | ENGINE HOOD LIGHT, LED (1) |
| 145 | 11031515 | 1 | COMPUTER TRAY W/STATIONARY STORAGE |
| 146 | 31088888 | 1 | INTERIOR SCUFF PLATES BRUSHED STAINLESS, B PILLERS (PAIR) |
| 147 | 31088888 | 1 | MAP BOX-ON TOP OF AC UNIT, CHF-4887 |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 148 | 31088888 | 1 | MICROPHONE BRACKET, MAGNETIC MIC, MM-SU-2012 |
| 149 | 29810100 | 1 | CHASSIS ELECTRICAL DESCRIPTION |
| 150 | 30010135 | 1 | INSTRUMENTATION, AMETEK W/ CENTER & OVERHEAD CONSOLES (AERIALS) |
| | | | Upper Command Console:<br>  <br> |
| 151 | 30010510 | 1 | LOWER COMMAND CONSOLE, X15 |
| | | | Lower Command Console (15L engine):<br>  <br> |
| 152 | 30010720 | 1 | CAB PUMP SHIFTER, AIR, KPS SHIFTER (FOR HALE K-SERIES PUMP TRANSMISSION) |
| 153 | 30011000 | 1 | PUMP INTERLOCK, NOT CONNECTED WITH ODOMETER |
| 154 | 30030200 | 1 | CAB LOCKDOWN INDICATOR LIGHT, IN CAB |
| 155 | 30031612 | 1 | DO NOT MOVE LIGHT, WHELEN LINZ6 LED |
| 156 | 30031675 | 1 | DO NOT MOVE DISENGAGE BUTTON |
| 157 | 29930210 | 1 | DELETE MAPBOOK SLOT ON FRONT BREAKER PANEL |
| 158 | 29910100 | 1 | PROGRAMMABLE LOAD MANAGER, CLASS-1 SUPERNODE II |
| 159 | 30031100 | 1 | HIGH IDLE SWITCH |
| 160 | 11040000 | 1 | CAB ACCESSORY FUSE PANEL |
| 161 | 84541540 | 1 | POWER & GROUND STUDS, UPPER COMMAND CONSOLE |
| 162 | 84541545 | 1 | POWER & GROUND STUDS, LOWER COMMAND CONSOLE |
| 163 | 30110000 | 1 | VEHICLE DATA RECORDER, AKRON/WELDON |

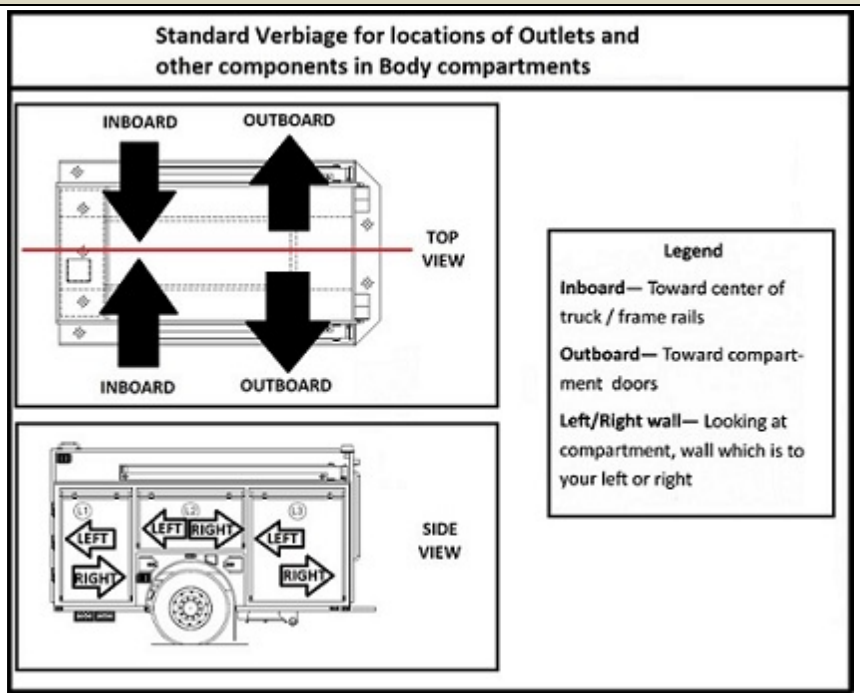
| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 164 | 30031840 | 4 | 12V DUAL POWER POINT, USB/USBC, KUSSMAUL (4) |
| 165 | 30088888 | 1 | MOMENTARY SWITCH FOR BACK-UP ALARM DISABLE |
| 166 | 30088888 | 1 | STORAGE SLOT W/0.5" LIP IN OVERHEAD CONSOLE 7 |
| 167 | 30088888 | 1 | 12 VOLT WIRE FOR HAAS |
| 168 | 33510035 | 1 | INTERIOR CAB LIGHTS, WHELEN 6" ROUND RED/CLEAR LED (3) |
| 169 | 34010035 | 1 | INTERIOR CREW LIGHTS, WHELEN 6" ROUND RED/CLEAR LED (3) |
| 170 | 34088888 | 1 | TECHNIQ D07 ACCENT LIGHTING LED (4) |
| 171 | 28010750 | 1 | DEFROSTER, HEATER & A/C, SEVERE CLIMATE (TM-31) |
| 172 | 28090003 | 1 | HEAT TO FEET |
| 173 | 28030500 | 1 | DEFROSTER DUCTWORK, ENTIRE WINDSHIELD |
| 174 | 11031687 | 1 | TOP HEAT/AC STORAGE, TOOL MOUNTING PLATE, 25” x 19.5” |
| 175 | 11031695 | 1 | REAR HEAT/AC STORAGE, 5 SLOTS (4 SMALL, 1 LARGE) |
| 176 | 28030000 | 1 | METAL VENT COVERS FOR DEFROSTER/AC |
| 177 | 28031001 | 1 | FAN, 12 VOLT, DRIVER'S SIDE, MOUNTED OUTBOARD OF WINDSHIELD |
| 178 | 28031101 | 1 | FAN, 12 VOLT, OFFICER'S SIDE, MOUNTED OUTBOARD OF WINDSHIELD |
| 179 | 28088888 | 1 | DIFFUSER FOR FRONT OF DEFROSTER/AC CHF-7344 |
| 180 | 38510206 | 1 | DRIVER'S SEAT, BOSTROM SIERRA AIR RIDE ABTS (DURAWEAR PLUS, LOW SEAM) |
| 181 | 38340110 | 1 | PRIMARY SEAT POSITION |
| 182 | 38350100 | 1 | SEAT BELT CONFIGURATION, PULL FROM LEFT SHOULDER TO BUCKLE AT RIGHT HIP |
| 183 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 184 | 39010210 | 1 | OFFICER'S SEAT, BOSTROM TANKER 550, ABTS SCBA (DURAWEAR PLUS, LOW SEAM) |
| 185 | 38340110 | 1 | PRIMARY SEAT POSITION |
| 186 | 38350200 | 1 | SEAT BELT CONFIGURATION, PULL FROM RIGHT SHOULDER TO BUCKLE AT LEFT HIP |
| 187 | 39030010 | 1 | OFFICER’S SEAT COMPT, OPEN FRONT |
| 188 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 189 | 39521307 | 1 | CREW SEAT 1, BOSTROM TANKER 550, ABTS SCBA (DURAWEAR PLUS, LOW SEAM) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 190 | 38340110 | 1 | PRIMARY SEAT POSITION |
| 191 | 38350200 | 1 | SEAT BELT CONFIGURATION, PULL FROM RIGHT SHOULDER TO BUCKLE AT LEFT HIP |
| 192 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 193 | 39521308 | 1 | CREW SEAT 2, BOSTROM TANKER 550, ABTS SCBA (DURAWEAR PLUS, LOW SEAM) |
| 194 | 38340110 | 1 | PRIMARY SEAT POSITION |
| 195 | 38350100 | 1 | SEAT BELT CONFIGURATION, PULL FROM LEFT SHOULDER TO BUCKLE AT RIGHT HIP |
| 196 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 197 | 39521623 | 1 | CREW SEAT 3, BOSTROM TANKER 550, ABTS, SCBA (DURAWEAR PLUS, LOW SEAM) |
| 198 | 38340120 | 1 | SECONDARY SEAT POSITION |
| 199 | 38350100 | 1 | SEAT BELT CONFIGURATION, PULL FROM LEFT SHOULDER TO BUCKLE AT RIGHT HIP |
| 200 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 201 | 39521624 | 1 | CREW SEAT 4, BOSTROM TANKER 550, ABTS, SCBA (DURAWEAR PLUS, LOW SEAM) |
| 202 | 38340120 | 1 | SECONDARY SEAT POSITION |
| 203 | 38350200 | 1 | SEAT BELT CONFIGURATION, PULL FROM RIGHT SHOULDER TO BUCKLE AT LEFT HIP |
| 204 | 38320000 | 1 | HELMET STORED IN COMPARTMENT |
| 205 | 39550200 | 1 | SEAT COLOR, BLACK |
| 206 | 39530705 | 6 | BOSTROM ZIP CLEAN REMOVABLE COVERS, INCLUDES ADDITIONAL COVERS FOR BOTTOM SEAT CUSHION AND BACK REST (PER SEAT) (6) |
| 207 | 39560115 | 1 | ARTWORK PROOF, BOSTROM (EXISTING PROOF ON FILE) |
| 208 | 39560510 | 6 | CUSTOM SEAT LOGOS, BOSTROM (PER SEAT) (6) |
| 209 | 39610115 | 5 | SCBA BRACKETS, IMMI SMART DOCK (5) |
| 210 | 38410000 | 1 | SEAT BELT WARNING SYSTEM, AKRON / WELDON |
| 211 | 39710015 | 1 | FULL WIDTH CREW SEAT COMPT, FRONT DROP-DOWN DOORS (73" CAB) |
| 212 | 30080150 | 1 | HD STEREO, JENSEN, AM/FM/WB/BT |
| 213 | 84561315 | 1 | CAMERA SYSTEM, BRIGADE, SINGLE HD CAMERA (WIRED) |
| 214 | 10310200 | 1 | PUMP & PLUMBING |
| PUMP & PLUMBING | | | |
| 215 | 60012305 | 1 | QMAX-1500 GPM 6" SUCTION SINGLE STAGE PUMP |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 216 | 60025210 | 1 | GEARBOX, HALE, K-SERIES, FRONT MOUNTED |
| 217 | 60026020 | 1 | MECHANICAL PUMP SEAL, HALE |
| 218 | 60030365 | 1 | MANUAL PUMP OVERRIDE |
| 219 | 60031008 | 1 | ALLOY ANODES PRO, HALE (3) |
| 220 | 60035123 | 1 | PUMP TEST, THIRD PARTY TESTING |
| 221 | 61510010 | 1 | DELETE AUXILIARY COOLER (HEAT EXCHANGER) |
| 222 | 62010002 | 1 | STAINLESS STEEL PIPING |
| 223 | 61020007 | 1 | PRESSURE GOVERNOR, FIRE RESEARCH, PUMP BOSS MAX |
| 224 | 61228888 | 1 | INTAKE PRESSURE CONRTOL RELIEF, ELKHART, 40-20 (3) |
| 225 | 63021100 | 1 | 6" MAIN SUCTION, LEFT SIDE |
| 226 | 63030400 | 1 | HALE MASTER INTAKE VALVE, ELEC |
| 227 | 63060100 | 1 | RELIEF VALVE FOR MIV |
| 228 | 63034650 | 1 | ADAPTER, 6" NST FE X 5" STORZ, 30 DEGREE W/CAP & CHAIN, TFT |
| 229 | 65030000 | 1 | 2.5" LEFT SIDE INLET |
| 230 | 61720100 | 1 | VALVE, AKRON HEAVY DUTY |
| 231 | 61770100 | 1 | ACTUATOR, VALVE, SWING HANDLE |
| 232 | 60036010 | 1 | THREADS, NST |
| 233 | 63034700 | 1 | ADAPTER, 2.5" NST M X 3" STORZ, 30 DEGREE W/CAP & CHAIN, HARRINGTON |
| 234 | 63025100 | 1 | 6" MAIN SUCTION, RIGHT SIDE |
| 235 | 63030400 | 1 | HALE MASTER INTAKE VALVE, ELEC |
| 236 | 63060100 | 1 | RELIEF VALVE FOR MIV |
| 237 | 63034650 | 1 | ADAPTER, 6" NST FE X 5" STORZ, 30 DEGREE W/CAP & CHAIN, TFT |
| 238 | 64030000 | 1 | 2.5" RIGHT SIDE INLET |
| 239 | 61720100 | 1 | VALVE, AKRON HEAVY DUTY |
| 240 | 61770100 | 1 | ACTUATOR, VALVE, SWING HANDLE |
| 241 | 60036010 | 1 | THREADS, NST |

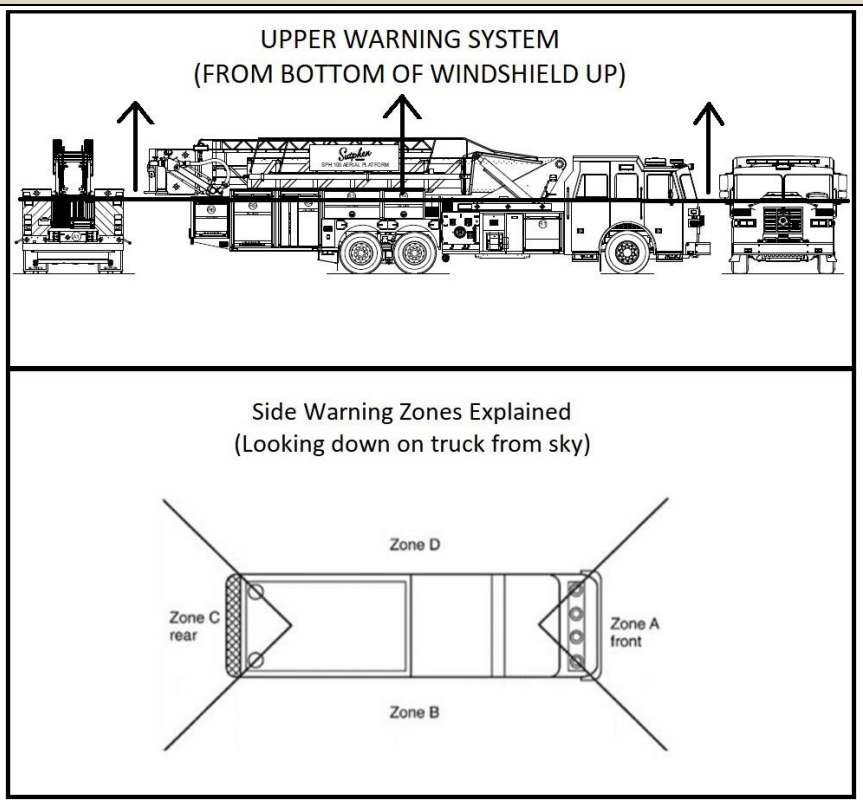
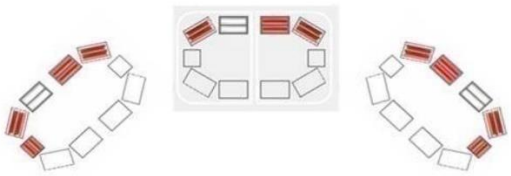
| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 242 | 63034700 | 1 | ADAPTER, 2.5" NST M X 3" STORZ, 30 DEGREE W/CAP & CHAIN, HARRINGTON |
| 243 | 70525125 | 1 | 2.5" DISCHARGE, LEFT - POSITION 1 |
| 244 | 61720100 | 1 | VALVE, AKRON HEAVY DUTY |
| 245 | 61770200 | 1 | ACTUATOR, VALVE, AKRON HANDWHEEL |
| 246 | 77021015 | 1 | GAUGE, DISCH, INNOVATIVE CONTROLS TC SERIES, 2.5" |
| 247 | 61810150 | 1 | DISCHARGE TERMINATION, 30 DEGREE ELBOW |
| 248 | 60036010 | 1 | THREADS, NST |
| 249 | 61840200 | 1 | ADAPTER, 2.5" NST FE X 3" STORTZ W/CAP & CHAIN, HARRINGTON |
| 250 | 71025125 | 1 | 2.5" DISCHARGE, RIGHT - POSITION 3 |
| 251 | 61720100 | 1 | VALVE, AKRON HEAVY DUTY |
| 252 | 61770425 | 1 | ACTUATOR, VALVE, ELECTRIC, AKRON 9333 |
| 253 | 77021015 | 1 | GAUGE, DISCH, INNOVATIVE CONTROLS TC SERIES, 2.5" |
| 254 | 61810150 | 1 | DISCHARGE TERMINATION, 30 DEGREE ELBOW |
| 255 | 60036010 | 1 | THREADS, NST |
| 256 | 61840200 | 1 | ADAPTER, 2.5" NST FE X 3" STORTZ W/CAP & CHAIN, HARRINGTON |
| 257 | 72810150 | 1 | DELETE STD CROSSLAYS (SPH) |
| 258 | 61742000 | 1 | MASTER PUMP DRAIN, MULTIPORT |
| 259 | 61730005 | 5 | DRAIN VALVES, INNOVATIVE CONTROLS, LIFT-UP (5) |
| 260 | 78521445 | 1 | WATERWAY CONTROL, 4” VALVE, AKRON 9335 ELECTRIC ACTUATOR |
| 261 | 61910100 | 1 | WATERWAY DRAIN VALVE, AKRON 1.5" PUSH/PULL CONTROL |
| 262 | 78588888 | 1 | WATERWAY OVERRIDE, HAND WHEEL |
| 263 | 10310220 | 1 | PUMP PANEL |
| PUMP PANEL | | | |
| 264 | 74920210 | 1 | SPH1 - SIDE MOUNT PUMP PANEL |
| 265 | 74930510 | 1 | PANEL FINISH, BRUSHED STS |
| 266 | 74931000 | 1 | ESCUTCHEON PLATES |
| 267 | 74931050 | 1 | COLOR CODING |

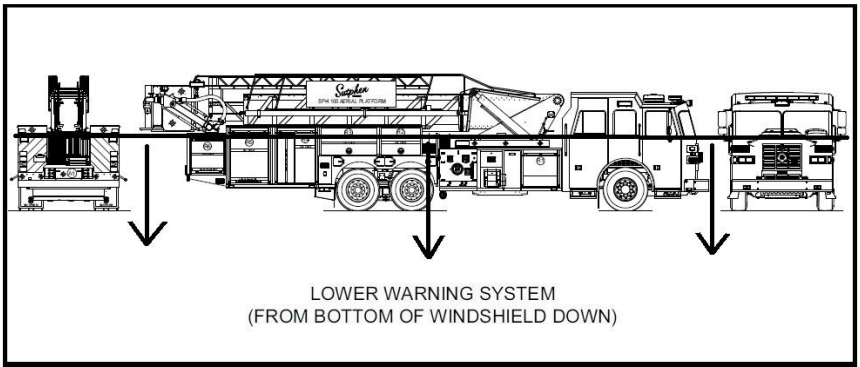
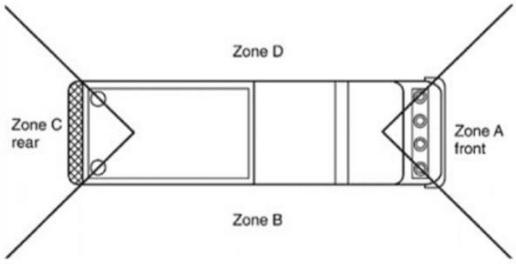
| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 268 | 74931210 | 1 | PUMP MODULE FRAMEWORK, NON-PAINTED |
| 269 | 74931320 | 1 | PUMP FINISH, PAINTED BY SUTPHEN |
| 270 | 74931530 | 1 | PLUMBING FINISH, PAINTED BY SUTPHEN |
| 271 | 75088888 | 1 | PLUMBING FINISH AND VALVES NATURAL |
| 272 | 75510230 | 1 | PUMP OPERATOR LIGHTS, TECNIQ E44 LED STRIP |
| 273 | 75530112 | 1 | PUMP PANEL LIGHTS OFFICER'S SIDE, TECNIQ E44 LED STRIP |
| 274 | 76010200 | 1 | PUMP PANEL GAUGES & CONTROLS - NO TANK OPTION |
| 275 | 60028050 | 1 | PUMP PRIMER, TRIDENT, AIR |
| 276 | 60028310 | 1 | (1) PRIMER BUTTON - MAIN SUCTION |
| 277 | 76025100 | 1 | COMPRESSION FITTINGS ON AIR SYSTEM (CTZ PUMP MODULE) |
| 278 | 76031970 | 1 | AIR OUTLET, DRIVER'S SIDE PUMP PANEL |
| 279 | 76030805 | 1 | HALE TRV-L THERMAL RELIEF VALVE WITH LIGHT AT PUMP PANEL |
| 280 | 76030410 | 1 | INNOVATIVE CONTROLS GAUGE HEATER BOX WITH FOUR TAPES |
| 281 | 76030411 | 1 | ADDITIONAL IC HEAT TAPES (1) |
| 282 | 76031900 | 1 | AIR HORN PUSH BUTTON SWITCH ON PUMP PANEL |
| 283 | 76510065 | 1 | GAUGES, MASTER, INNOVATIVE CONTROLS TC SERIES, 4" |
| 284 | 10310230 | 1 | WATER TANK |
| **WATER TANK** | | | |
| 285 | 83520300 | 1 | DELETE WATER TANK |
| 286 | 10310300 | 1 | BODY |
| **BODY** | | | |
| 287 | 80117030 | 1 | BODY SPH-3, LEFT 56" H / RIGHT 56"H |
| 288 | 80029910 | 1 | BODY SUBFRAME, SPH100 |
| 289 | 10310302 | 1 | BODY COMPARTMENTS |
| **BODY COMPARTMENTS** | | | |

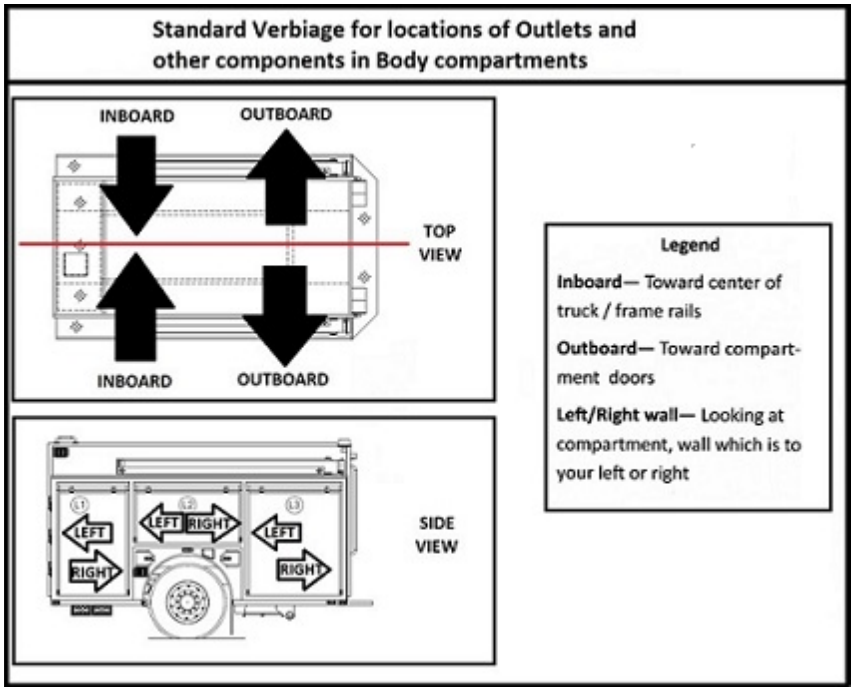
| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| | | |  |
| 290 | 81130200 | 1 | ADJUSTABLE SHELF [L3] (1) |
| 291 | 80280410 | 1 | 3/16" ALUMINUM MOUNTING PLATE (PER WALL) [L3] (1) |
| 292 | 81130200 | 3 | ADJUSTABLE SHELF [L4] (3) |
| 293 | 81140100 | 1 | FIXED VERTICAL DIVIDER [L4] (1) |
| 294 | 81130200 | 1 | ADJUSTABLE SHELF [L5] (1) |
| 295 | 81130200 | 1 | ADJUSTABLE SHELF [L6] (1) |
| 296 | 81130200 | 1 | ADJUSTABLE SHELF [R1] (1) |
| 297 | 81150305 | 1 | 600# SLIDE-MASTER TRAY, 100% SLIDEOUT [R1] (1) |
| 298 | 81088888 | 1 | 12" FULL WIDTH BACK STOP TO SLIDE MASTER TRAY (R1) |
| 299 | 81130200 | 1 | ADJUSTABLE SHELF [R2] (1) |
| 300 | 80280410 | 1 | 3/16" ALUMINUM MOUNTING PLATE (PER WALL) [R2] (1) |
| 301 | 80280410 | 1 | 3/16" ALUMINUM MOUNTING PLATE (PER WALL) [R3] (1) |
| 302 | 81088888 | 1 | MOUNT TWO (2) PIECES OF UNISTRUT OF CEILING OF R2/R3 COMPARMENTS WITH STRAPS TO SECURE |
| 303 | 81130200 | 3 | ADJUSTABLE SHELF [R4] (3) |
| 304 | 81140100 | 1 | FIXED VERTICAL DIVIDER [R4] (1) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 305 | 81130200 | 1 | ADJUSTABLE SHELF [R5] (1) |
| 306 | 81150100 | 1 | 250# ROLL OUT DRAWER ADJUSTABLE TRACK [R5] (1) |
| 307 | 81150305 | 1 | 600# SLIDE-MASTER TRAY, 100% SLIDEOUT [R5] (1) |
| 308 | 81130200 | 1 | ADJUSTABLE SHELF [R6] (1) |
| 309 | 81150312 | 1 | 500# SLIDE-OUT TRAY W/POLY SLIDES, A1 COMPT (SPH100/SL100) [A1] (1) |
| 310 | 80388888 | 1 | BLOCK OFF VENT FOR L1 |
| 311 | 81165705 | 1 | UNISTRUT TRACK IN COMPTS |
| 312 | 80220230 | 1 | COMPT DOORS, AMDOR ROLL-UP, SATIN FINISH |
| 313 | 80230200 | 13 | COMPT DOOR LOCKS, KEYED ALIKE (13) |
| 314 | 84531110 | 1 | COMPT LIGHTING, AMDOR LED LIGHT STRIPS, 2 PER COMPT |
| 315 | 80288888 | 1 | HATCH COMPARTMENT IN L4 COMPARTMENT |
| 316 | 10310305 | 1 | BODY EXTERIOR |
| | | | **BODY EXTERIOR** |
| 317 | 81320205 | 1 | SPH 100 HOSEBED, ALUM FLOORING |
| 318 | 81410000 | 1 | COVER, VINYL, MAIN HOSE BED |
| 319 | 81431320 | 1 | REAR HOSEBED COVER, SMOOTH ALUM DOOR |
| 320 | 81431150 | 1 | STAY-OPEN MECHANISM FOR REAR ENCLOSURE DOORS (PAIR) |
| 321 | 81440210 | 1 | COVER FASTENERS, METAL SNAPS |
| 322 | 81332115 | 1 | HOSEBED LIGHTING, SIDES, TECNIQ E44 LED LIGHT STRIPS |
| 323 | 81910500 | 1 | HANDRAILS, KNURLED STS, SPH100 |
| 324 | 82014500 | 1 | STEPS, IC FOLD DOWN W/LIGHT (SPH) |
| 325 | 82510000 | 1 | RUB RAILS, ANODIZED ALUM |
| 326 | 83010125 | 1 | ALUMINUM TREADPLATE (SPH) |
| 327 | 80290101 | 1 | FIBERGLASS WHEEL WELL LINERS (TANDEM AERIALS) |
| 328 | 80231258 | 1 | 6 SCBA CYLINDER COMPTS (TANDEM BODY) |
| 329 | 80290310 | 6 | DOOR FINISH, BRUSHED STAINLESS, SINGLE/DOUBLE SCBA COMPT (6) |
| 330 | 89988888 | 1 | PIKE POLE STORAGE COMPARTMENT |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 331 | 89988888 | 1 | RUBBER FENDERETTES |
| 332 | 83030605 | 1 | REAR FENDERS, STAINLESS SMOOTH PAINTED (TANDEM AERIALS) |
| 333 | 89028888 | 1 | LADDER PACKAGE DUO-SAFETY, 209' |
| 334 | 89030605 | 1 | LITTLE GIANT LADDER, MODEL 17 9'-15' (1) |
| 335 | 89530910 | 1 | MOUNTING OF ROOF LADDER ON BASE SECTION OF AERIAL (1) |
| 336 | 89512200 | 1 | LADDERS ENCLOSED IN HOSEBED ON BEAM (SPH) |
| 337 | 89520220 | 1 | LADDER ENCLOSURE, SMOOTH ALUM DOOR |
| 338 | 89088888 | 1 | CUSTOM LADDER CHUTE TO HOLD FULL COMPLIMENT OF LADDERS |
| 339 | 89088888 | 1 | MOUNTING OF STEP LADDERS TWO (2) W/ PAC BRACKET AND ALUMINUM STOP |
| 340 | 89088888 | 1 | LADDER MOUNTED ON BODY BELOW BUCKET ABOVE L6 & LADDER CHUTE AREA TOP OF THE BODY NOTE: REFERANCE FOREST GROVE PA |
| 341 | 10310310 | 1 | ELECTRICAL |
| ELECTRICAL | | | |
| 342 | 84550199 | 1 | LICENSE PLATE BRACKET - NOT PROVIDED |
| 343 | 84511100 | 1 | BODY ELECTRICAL DESCRIPTION |
| 344 | 84520000 | 1 | BACK UP ALARM, ECCO SA917 |
| 345 | 85010420 | 1 | TAILLIGHTS, WHELEN M6 SERIES, LED STOP/TAIL/TURN/REVERSE, QUAD HOUSING (PAIR) |
| 346 | 85110100 | 1 | ICC LIGHTS, LED |
| 347 | 85130100 | 1 | MARKER LIGHTS, BRITAX, FLEXIBLE, LED, PAIR, ON SIDES OF BODY, REAR CORNERS |
| 348 | 85528888 | 1 | REMOVE WHELEN 2G ON FRONT OF BODY |
| 349 | 85710037 | 1 | UNDERCARRIAGE GROUND LIGHTS, TECNIQ T44 LED (TANDEM) |
| 350 | 85730100 | 1 | UNDERCARRIAGE GROUND LIGHTS, INDEPENDENT SWITCH |
| 351 | 86600105 | 1 | OPTICAL WARNING SYSTEM, UPPER (SPH100) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| | | |  |
| **352** | **86610400** | **1** | **UPPER WARNING LIGHTS, ZONE A (FRONT), WHELEN FREEDOM IV 23.25" LED LIGHT BARS, CUSTOM (QTY 3)** |
| | | |  |
| **353** | **86699999** | **1** | **UPPER WARNING LIGHTS, ZONE B (OFFICER'S SIDE), COVERED BY ZONES A & C** |
| **354** | **86710120** | **1** | **UPPER WARNING LIGHTS, ZONE C (REAR), WHELEN LED BEACONS, MCFLED2* (PAIR)** |
| **355** | **86810200** | **1** | **UPPER WARNING LIGHTS, ZONE C (REAR PLATFORM), WHELEN M6 LED, M6* (QTY 1)** |
| **356** | **86899999** | **1** | **UPPER WARNING LIGHTS, ZONE D (DRIVER'S SIDE), COVERED BY ZONES A & C** |
| **357** | **87100105** | **1** | **OPTICAL WARNING SYSTEM, LOWER (SPH100)** |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| | | |  <br>LOWER WARNING SYSTEM<br>(FROM BOTTOM OF WINDSHIELD DOWN)<br><br>Side Warning Zones Explained<br>(Looking down on truck from sky)<br>  <br> |
| **358** | **87110210** | **1** | **LOWER WARNING LIGHTS, ZONE A (FRONT), WHELEN M6 LED, M6* (QTY 4)** |
| **359** | **87811130** | **1** | **LOWER, ZONE A - MOUNTING LOCATION (DUAL HOUSINGS)** |
| **360** | **87210220** | **1** | **LOWER WARNING LIGHTS, ZONE B (OFFICER'S SIDE), WHELEN M6 LED, M6* (QTY 4)** |
| **361** | **87812140** | **1** | **LOWER, ZONE B - MOUNTING LOCATION (SL100, SLR108, SPH100)** |
| **362** | **87310200** | **1** | **LOWER WARNING LIGHTS, ZONE C (REAR), WHELEN M6 LED, M6* (QTY 2)** |
| **363** | **87410220** | **1** | **LOWER WARNING LIGHTS, ZONE D (DRIVER'S SIDE), WHELEN M6 LED, M6* (QTY 4)** |
| **364** | **87814140** | **1** | **LOWER, ZONE D - MOUNTING LOCATION (SL100, SLR108, SPH100)** |
| **365** | **87537734** | **4** | **ADDITIONAL WARNING LIGHTS, WHELEN M6 LED, M6* (PAIR) (4)** |
| **366** | **87537738** | **6** | **ADDITIONAL WARNING LIGHTS, WHELEN ION T-SERIES LED, TLI*(PAIR) (6)** |
| **367** | **86537816** | **3** | **SCENE LIGHTS, WHELEN M9 LED, SURFACE MOUNT (PAIR) (3)** |
| **368** | **88393112** | **3** | **BROW LIGHT SCENE LIGHTS, FIRETECH MB DOUBLE STACK 20.6", 12V LED, FIXED, 36 LED, FT-MB-2.18-FT-* (3)** |
| **369** | **88393116** | **4** | **BODY SCENE LIGHTS, FIRETECH MB DOUBLE STACK 30.2", 12V LED, FIXED, 54 LED, FT-MB-2.27-FT-* (4)** |
| **370** | **88399940** | **3** | **ADDITIONAL SWITCH, 3-WAY FOR 12V LIGHTS (EA) (3)** |
| **371** | **86588888** | **1** | **LIGHT MOUNTING BOX FOR LIGHT, TREADPLATE (QTY 4)** |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 372 | 10310320 | 1 | GENERATOR & ACCESSORIES |
| GENERATOR & ACCESSORIES | | | |
| | | |   |
| 373 | 88230616 | 1 | GENERATOR, HARRISON, 15KW HYD AERIALS |
| 374 | 88250415 | 1 | CIRCUIT BREAKER PANEL, EATON NEMA 3R |
| 375 | 88251120 | 1 | BREAKER PANEL, STD LOCATION (L2) |
| 376 | 88250100 | 1 | 120 VOLT OUTLET W/WEATHERPROOF COVER - EACH (1) |
| 377 | 88232025 | 1 | AUTOMATIC TRANSFER SWITCH, PROGRESSIVE DYNAMICS, PD5100 |
| 378 | 88388888 | 1 | ADDITIONAL CIRCUIT BREAKER PANEL WITH 16 SPACES FOR BREAKER PANEL |
| 379 | 88388888 | 1 | PORTABLE GENERATOR INLET W/MECHANICAL INTERLOCK SWITCH |
| 380 | 88433010 | 2 | MOUNTING OF ELEC CORD REEL IN BODY COMPT |
| 381 | 88432000 | 2 | AKRON FOUR-WAY RECEPTACLE BOX, WIRED TO REEL CABLE (2) |
| 382 | 88488888 | 2 | QUANITY (2) HANNAY ECR1622-17-18 W/200' of 10/4 (QTY 2) |
| 383 | 88328888 | 1 | LIGHTOWER 6 HEAD SPECTRA |
| 384 | 88380990 | 1 | DEFLECTOR, TREADPLATE, FORWARD OF LIGHT TOWER |
| 385 | 88390800 | 1 | LIGHT, FR SPECTRA, LED, SURFACE MNT, 15K LUMENS, 240V, FACE OF PLATFORM (1) |
| 386 | 88390801 | 2 | LIGHT, FR SPECTRA, LED, SURFACE MNT, 15K LUMENS, 240V, UNDER PLATFORM (2) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 387 | 88390843 | 2 | LIGHT, FR SPECTRA, LED, TELE, 20K LUMENS, 240V, SPH PLATFORM (2) |
| 388 | 88399959 | 1 | SCUFF PLATES FOR TELE LIGHTS - NOT PROVIDED |
| 389 | 88399920 | 4 | ADDITIONAL SWITCH, 3-WAY FOR 120/240V LIGHTS (EA) (4) |
| 390 | 10310400 | 1 | AERIAL |
| | | | **AERIAL** |
| 391 | 10040610 | 1 | MODEL SPH100, AERIAL COMPONENTS |
| 392 | 94020236 | 1 | AERIAL TOWER ASSEMBLY, SPH100 |
| 393 | 94020315 | 1 | TURNTABLE ACCESS, LOWER LEFT, FIXED STEPS |
| 394 | 94020320 | 1 | FIXED STEP UNDER TURNTABLE ACCESS STEP |
| 395 | 94020345 | 1 | TURNTABLE ACCESS, UPPER LEFT, FOLDING STEPS |
| 396 | 94020360 | 1 | TURNTABLE ACCESS, UPPER RIGHT, FOLDING STEPS |
| 397 | 94020250 | 1 | INTERLOCK SYSTEM |
| 398 | 94020260 | 1 | ROTATION LIMITING SYSTEM & SMART BOOM WARNING SYSTEM |
| 399 | 94020265 | 1 | ROTATION LIMITING ALARM , FLOYD BELL US-09-515-S |
| 400 | 94020272 | 1 | HYDRAULIC SYSTEM - SPH100 |
| 401 | 94020900 | 1 | 12 VOLT AUXILIARY HYDRAULIC POWER |
| 402 | 94020286 | 1 | PEDESTAL CONTROLS, PROPORTIONAL TYPE, SPH100 |
| 403 | 94021212 | 1 | BOOM ASSEMBLY - SPH100 |
| 404 | 94020465 | 1 | AERIAL SPOT LIGHTS – (2) FIRETECH FT-WL-X-5-S-B, LED (SP95,100,110,SPH) |
| 405 | 94021327 | 1 | LADDER SPH 100 HIGH RAIL, FULL PROFILE AT TURNTABLE - CABLE TRACK |
| 406 | 94020490 | 1 | LADDER LIGHTING SYSTEM, FIRETECH FT-WL-2000-S-B, LED (SP95, 100, 110, SPH) |
| 407 | 94021337 | 1 | HYDRAULIC CYLINDERS - SPH 100 |
| 408 | 94021344 | 1 | AERIAL TOWER WATERWAY - 110 & SPH 100 |
| 409 | 94021027 | 1 | OUTRIGGER GROUND JACKS, MANUAL CONTROL, SPH100 |
| 410 | 94021052 | 1 | OUTRIGGERS, PINLESS |
| 411 | 94021090 | 1 | AERIAL JACKS ALARM, ECCO DT500 |
| 412 | 94021064 | 1 | OUTRIGGER SPOT LIGHTS, FIRETECH LASER CANON |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 413 | 94021110 | 1 | OUTRIGGER DISPLAY PANEL COVER, CLEAR PLEXIGLASS |
| 414 | 94021155 | 1 | OFFICER'S SIDE AREA, REAR OF OUTRIGGER, COMPARTMENT W/HINGED DOOR |
| 415 | 93910288 | 1 | JACK PADS NOT PROVIDED - SPH100 |
| 416 | 94021340 | 1 | OPERATIONAL TEST - AERIAL PLATFORMS |
| 417 | 94040052 | 1 | LADDER TEST, THIRD PARTY TESTING |
| 418 | 94088888 | 1 | SECONDARY CAMERA SYSTEM FOR JACK PLACEMENT |
| 419 | 94210016 | 1 | 4-DOOR PLATFORM, SPH |
| 420 | 94210145 | 1 | PLATFORM DOOR SKIN, FORWARD FACING, DIAMONDPLATE (SPH) |
| 421 | 94210155 | 1 | PLATFORM DOOR SKIN, REARWARD FACING, DIAMONDPLATE (SPH) |
| 422 | 94210014 | 1 | PLATFORM ACCESS LADDER |
| 423 | 94210318 | 1 | PLATFORM BOOM CONTROLS, PROPORTIONAL TYPE, SPH/SPI112 |
| 424 | 94210342 | 1 | PLATFORM CONTROL COVER, DIAMONDPLATE |
| 425 | 94210295 | 1 | MARKER LIGHTS, BRITAX FLEXIBLE, LED, PAIR, ON SIDES OF YOKE |
| 426 | 94210350 | 1 | 120 VOLT OUTLET IN PLATFORM |
| 427 | 94210802 | 1 | 75 GPM WATER CURTAIN FOR SPH 100 or SPI112 |
| 428 | 94210705 | 1 | YOKE OUTLETS - SPH100 |
| 429 | 94288888 | 1 | DRIVERS SIDE 4" ELECTRIC YOKE VALVE TO BE CONTROLLED FROM (2) AKRON 9333 CONTROLLERS (2) |
| 430 | 94288888 | 1 | ROPE ROLLERS IN PLACE OF LIFTING EYE 800LBS |
| 431 | 94288888 | 1 | ADDITIONAL TIE-OFF POINTS, FRONT OF PLATFORM (PAIR) |
| 432 | 94210544 | 1 | MONITOR, DS, TFT MONSOON RC, ELEC, W/ ELEC VUM, (2) PANEL CONTROLLERS & (1) WIRELESS CONTROLLER, INCLUDES TFT MASTER STREAM 1250 GPM ELEC NOZZLE |
| 433 | 94210541 | 1 | MONITOR, OS, TFT MONSOON, MANUAL 1250 GPM W/ MANUAL VUM |
| 434 | 94210683 | 1 | NOZZLE, OS, TFT MST-4NJ STACKED TIPS W/XF-SS10 STREAM STRAIGHTENER |
| 435 | 94210997 | 1 | INTERCOM SYSTEM, FRC ACT 2-STATION |
| 436 | 94210017 | 1 | PARAPET LADDER, SPH100 |
| 437 | 94280150 | 1 | STOKES ARMS, SPH100 PLATFORM |
| 438 | 94280101 | 1 | STOKES STORAGE BOX, PAINTED, MOUNTED ON BOOM (1) |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 439 | 94295001 | 1 | SINGLE LIFTING EYE, 800 LB. |
| 440 | 10310410 | 1 | PAINT & FINISH |
| | | | **PAINT & FINISH** |
| 441 | 89910010 | 1 | CORROSION REDUCTION PROGRAM (PROPOSALS) |
| 442 | 90010030 | 1 | STAINLESS PAINT SCHEME - CORP AERIALS |
| 443 | 90030004 | 1 | PAINT, SINGLE TONE |
| 444 | 90030159 | 1 | PAINT FRAME RAILS, FUEL BEAM, BODY REAR DROP & LOWER AERIAL COMPONENTS - BLACK (TANDEM) |
| 445 | 90030032 | 1 | PAINT, TURNTABLE, SIDE PLATES & LIFT CYLINDER OTHER THAN SILVER |
| 446 | 90030034 | 1 | PAINT, LADDER SHEAVE BEAMS, EXT CYLINDER & YOKE OTHER THAN SILVER |
| 447 | 90030015 | 1 | A/C CONDENSER PAINTED ROOF COLOR |
| 448 | 90520150 | 1 | GRAPHICS PACKAGE, CFD |
| 449 | 90588888 | 1 | LETTERS FOR CAB ROOF |
| 450 | 90684120 | 1 | CHEVRON STRIPING, LADDER ENCLOSURE DOOR, REFLEXITE |
| 451 | 90684320 | 1 | CHEVRON STRIPING, REAR HOSEBED DOOR, REFLEXITE |
| 452 | 90681120 | 1 | CHEVRON STRIPING, REAR BODY OUTBOARD, REFLEXITE (Aerial Platforms) |
| 453 | 90681499 | 1 | CHEVRON STRIPING, REAR PLATFORM - NOT PROVIDED |
| 454 | 90710075 | 1 | BOOM SIGN, APPROX 88" X 26" |
| 455 | 90720130 | 1 | 12" LETTERING FOR BOOM SIGN |
| 456 | 90688888 | 1 | UNIT # MOUNTING PLATES (3) |
| 457 | 10310420 | 1 | EQUIPMENT |
| | | | **EQUIPMENT** |
| 458 | 91010000 | 1 | MISC EQUIP - (1) PINT TOUCH-UP PAINT, STAINLESS STEEL NUTS & BOLTS |
| 459 | 91088888 | 1 | RUBBER WHEEL CHOCKS |
| 460 | 89050100 | 1 | PIKE POLE STORAGE TUBES, (3) EA SIDE |
| 461 | 89088888 | 1 | PIKE POLE MOUNTING FLY SECTION |
| 462 | 10310600 | 1 | COMPLETION & WARRANTY |
| | | | **COMPLETION & WARRANTY** |

| Line | Item # | Qty | Item Description/Comments |
|---|---|---|---|
| 463 | 99010100 | 1 | MANUALS, ELECTRONIC VERSION (2-USB) |
| 464 | 99030100 | 1 | ADDITIONAL MANUFACTURER'S MANUAL (1) |
| 465 | 99031110 | 1 | DELIVERY, AERIAL APPARATUS |
| 466 | 99031810 | 1 | FACTORY PROVIDED OPERATIONAL DEMONSTRATION |
| 467 | 99520210 | 1 | WARRANTY, ONE YEAR - AERIALS (DUBLIN) |
| 468 | 99521100 | 1 | WARRANTY, FRAME, LIFETIME |
| 469 | 99521200 | 1 | WARRANTY, CAB STRUCTURAL, 10 YR. |
| 470 | 99521300 | 1 | WARRANTY, BODY STRUCTURAL, 10 YR. |
| 471 | 99521400 | 1 | WARRANTY, PAINT, 10 YR. |
| 472 | 99521500 | 1 | WARRANTY, AERIAL MECHANICAL, 2 YR. |
| 473 | 99521600 | 1 | WARRANTY, AERIAL STRUCTURAL, 30 YR. |
| 474 | 99521900 | 1 | WARRANTIES, MAJOR VENDOR COMPONENTS |
| | | | **SUPPLIED** |
| 475 | PDB000573 | 1 | SUPPLIED - Black Turtle Tile Matting |
| 476 | PDB001176 | 1 | SUPPLIED - EQUIPMENT PACKAGE, CFD (AERIALS) |
| 477 | PDB001019 | 1 | SUPPLIED - COMMUNICATION PKG COLUMBUS FIRE |
| 478 | PDB001313 | 1 | SUPPLIED - Columbus Customer Supplied Install Knox Box |
| 479 | PDB001314 | 1 | SUPPLIED - COLUMBUS FIRECOM HOOKS INSTALLED IN CAB QUAN (16) |
| 480 | 15030488 | 1 | SPECIAL Shoreline Inlet KUSSMAUL SUPER 30 AUTO EJECT |
| 481 | 15040100 | 5 | 120V OUTLET WIRED TO SHORELINE INLET - EA (5) |
| 482 | 11031930 | 1 | EXTERIOR DOOR, HINGED, PAINTED |
| 483 | 11032620 | 1 | OFFICER'S SIDE, RIGHT DOOR HINGE (OPEN TOWARDS FRONT OF CAB) |
| 484 | 90030190 | 1 | TEXTURED FRAME RAIL COATING, PLUMBING AREA |

## Table of Contents

## INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the purchaser a complete apparatus equipped as hereinafter specified. With a view of obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. The apparatus shall conform to the requirements of the current (at the time of bid) National Fire Protection Association Pamphlet #1901 for Motor Fire Apparatus unless otherwise specified in these specifications.

Bids shall only be considered from companies which have an established reputation in the field of fire apparatus construction and have been in business for a minimum of ten (10) years.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. Computer run-off sheets are not acceptable as descriptive literature.

The specifications shall indicate size, type, model and make of all component parts and equipment.

## STATEMENT OF EXCEPTIONS TO NFPA 1901

If, at the time of delivery, the apparatus manufacturer is not in compliance, a statement of exceptions must be provided as follows:

- The specific standard affected.
- A statement describing why the manufacturer is not in compliance.
- A description of the remedy, and who the responsible party is.

The document must be signed by an officer of the company, and an authorized agent of the purchaser. NO EXCEPTIONS

## QUALITY AND WORKMANSHIP

The design of the apparatus must embody the latest approved automotive engineering practices.

The workmanship must be the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged and ample safety factors must be provided to carry loads as specified and to meet both on and off road requirements and speed as set forth under "Performance Test and Requirements."

**PERFORMANCE TESTS AND REQUIREMENTS**

A road test shall be documented with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus. The apparatus, when loaded, shall be approximately 66% on the rear axle. The successful bidder shall furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

a. The apparatus must be capable of accelerating to 30 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.

b. The service brakes shall be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.

c. The apparatus, fully loaded, shall be capable of obtaining a speed of 50 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).

d. The apparatus shall be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.

e. The contractor shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

**FAILURE TO MEET TESTS**

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Permission to keep and/or store the apparatus in any building owned or occupied by the purchaser shall not constitute acceptance of same.

**EXCEPTIONS TO SPECIFICATIONS**

The following specifications shall be strictly adhered to. Exceptions shall be considered if they are deemed equal to or superior to the specifications, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions shall be listed by page and paragraph.

Failure to denote exceptions in the above manner shall result in immediate rejection of the proposal. In addition a general statement taking "TOTAL EXCEPTION" to the specifications shall result in immediate rejection of bid.

**GENERAL CONSTRUCTION**

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose shall be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association). Certified Laboratories certificate shall be submitted by the manufacturer. Weight of apparatus shall meet all federal axle load laws.

**DELIVERY REQUIREMENTS**

The apparatus shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the purchaser. Any and all alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense.

**PURCHASER RIGHTS**

The Purchaser reserves the right to accept or reject any bid. The purchaser also reserves the right to award in their best interest and reserves the right to waive any formalities.

**U.S.A. MANUFACTURER**

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

**MANUFACTURER'S EXPERIENCE**

Each manufacturer shall have been in business making similar apparatus for a minimum of seventy-five (75) years and must have had single ownership for more than fifty (50) years.

**ELIMINATION OF DIVIDED RESPONSIBILITY**

It is required that each bidder produce both the chassis and complete apparatus. To eliminate divided responsibility and service, the chassis and body must be manufactured by the same Company. Manufacturer shall state the number of years the Company has been producing their own chassis and body. Manufacturer shall state compliance with the paragraph. NO EXCEPTIONS.

**FAMA COMPLIANCE**

Manufacturer must be a current member of the Fire Apparatus Manufacturer's Association.

**PROPOSAL DRAWING**

A general layout drawing depicting the apparatus layout and appearance shall be provided with the bid. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views. The drawing shall be a depiction of the actual apparatus proposed and not of a generic similar product.

**APPROVAL DRAWING**

After the award of bid and pre-construction conference, a detailed layout drawing depicting the apparatus layout and appearance including any changes agreed upon shall be provided for customer review and signature. The drawing will become part of the contract documents. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views.

**WIRING SCHEMATIC**

Wiring diagrams of the apparatus shall be provided on a USB flash drive at the time of delivery.

**SUTPHEN MONARCH CUSTOM CHASSIS**

A Sutphen Monarch Severe Duty Cab and Chassis system shall be provided. The chassis shall be manufactured in the factory of the bidder. The chassis shall be designed and manufactured for heavy duty service with adequate strength and capacity of all components for the intended load to be sustained and the type of service required. The cab and chassis system, shall be considered the bidders “Top of the Line”.

There shall be no divided responsibility in the production of the apparatus.

**WHEELBASE**

The approximate wheelbase shall be 247".

**DOUBLE FRAME RAILS/TANDEM AXLES**

The chassis frame shall be of a ladder type design utilizing industry accepted engineering best practices. The frame shall be specifically designed for fire apparatus use.
Each frame rail shall be constructed of two .375” thick-formed channels. The outer channel shall be 10.188" x 3.50” x .375” and the inner channel (liner) shall be 9.31” x 3.13” x .375”.
The section modulus shall be 31.8 $in.^3$. The resistance to bending moment (RBM) over the entire rail will be at-least 3,498,000 in./lbs.
The cross-members shall be constructed of minimum 3/8" formed channels and have formed gusseted ends at the frame rail attachment. Tandem suspensions will use a multi-piece bolt assembled “butterfly” cross-member configuration. This cross-member will span the entire rear of the vehicle.
Each rail is media blasted to remove scale, oil, and contaminants. This blasting also ensures paint adhesion.
Each rail will be primed with Cathacoat 302HB, a high performance, two component, reinforced inorganic zinc-rich primer with proven cathodic protection of steel structures, prior to assembly.
.625 inch, grade 8 flange, Huck bolt fasteners shall be used on all permanently attached brackets to the frame to eliminate the need for bolt re-tightening.
A lifetime warranty shall be provided, per manufacturer's written statement.

**FRONT BUMPER CLIP**

The front clip of the subframe shall be designed with a built-in skid plate to protect the engine and chassis components. The front clip shall be painted the same color as the frame.

**FRONT TOW EYES, BELOW BUMPER**

There shall be two front tow eyes with 3” diameter holes attached directly to the chassis frame, accessible below the front bumper.

**REAR TOW EYES**

There shall be two tow eyes attached directly to the chassis frame rail and shall be chromate acid etched for superior corrosion resistance and painted to match the chassis.

**STEERING**

The steering system shall be a TRW wheel to wheel steering system that is tested and certified by TRW, consisting of a heavy duty TRW/Ross Model TAS-85 power steering gear, TRW PS36 steering pump, miter box, drag links, and a thermostatic controlled fan cooled system (set point 185 deg. F to 170 deg. F). The steering gear shall be bolted to the frame at the cross-member for steering linkage rigidity. Four (4) turns from lock to lock with an 18" diameter slip resistant rubber covered steering wheel. Steering column shall have six-position tilt and 2" telescopic adjustment. The cramp angle shall be 45 degrees with 315mm tires or 43 degrees with 425mm tires providing very tight turning ability.

**DRIVE LINE**

A SPICER LIFE (SPL) Series Model 250 driveline shall be provided with a Meritor universal joint assembly. This configuration provides longer bearing life with the highest power density available. A high-capacity bearing package with larger needle rollers are sealed with a long life double-lip Viton seal and seal guard to keep grease in and allow a better purge capability. The high power density allows transmission of higher torque with a smaller swing diameter, assisting in tight packaging requirements (184mm swing diameter / 130mm tube diameter / 5mm wall). The 110 mm of slip is boot protected. On-highway lubrication intervals, initial at 350,000 miles or 3 years (whichever comes first) and re-lube at 100,000 miles thereafter.

**ENGINE**

The apparatus shall be powered by a Cummins Diesel X 15 505 HP @ 1800 R.P.M., 1850 ft. lb. torque @ 1000 R.P.M.

Displacement: 14.9 liter displacement.
Cylinders: 6
Bore: 5.39” (137mm)
Stroke: 6.65” (169mm)

**AIR COMPRESSOR**

The air compressor shall be an 18.7 CFM engine driven Wabco.

**STARTER**

A 12-volt starter shall be provided, controlled by a switch on the left lower cab dash.

**EXHAUST SYSTEM**

The engine exhaust system shall be horizontal design constructed from heavy-duty truck components.

The engine exhaust system shall include the following components:

**STAINLESS STEEL TUBING**

Stainless Steel Flexible Bellows mounted at the turbo outlet. Stainless steel piping to the Aftertreatment Unit. Stainless steel piping from the Aftertreatment Unit to the stainless steel heat diffuser outlet.

**AFTERTREATMENT UNIT**

The single canister Aftertreatment Unit is a self-contained exhaust treatment system which includes:
DPF (diesel particulate filter)
DEF Injector/Reactor
SCR (selective catalytic reducer)

The DEF injector/reactor utilizes the DEF fluid, which consists of urea and purified water, to convert NOx into nitrogen and water. This will meet or exceed 2027 EPA emissions requirements. A heated aftertreatment system shall be provided that is powered from a belt-driven 48V alternator on the engine.

The Stainless Steel Flexible Bellows shall be used to isolate the exhaust system from engine vibrations. The single canister Aftertreatment Unit shall be mounted under the right side frame rail, meeting the specific engine manufacturer's specifications and current emission level requirements. The heat diffuser outlet shall be directed to the forward side of the rear wheels, exiting the right side with a heavy duty heat diffuser. The heat diffuser shall prevent the exhaust temperature from exceeding 851 deg. F during a regeneration cycle.

**INSULATED JACKETS**

Heat-absorbing, removable, insulated jackets shall be provided on the exhaust system from the turbo outlet in the engine compartment to the Aftertreatment Unit. The jackets will cover all piping, including the bellows, between the engine and the Aftertreatment Unit per engine manufacturers requirements insuring that the exhaust stream temperature remains elevated to ensure functionality with the Aftertreatment Unit. Additionally, the insulated jackets will protect the engine componentry from excessive heat generated by the exhaust.

**ON-BOARD DIAGNOSTIC (OBD) SYSTEM**

The engine shall be equipped with an on-board diagnostic (OBD) system which shall monitor emissions-related engine systems and components and alert the operator of any malfunctions. The OBD system is designed to further enhance the engine and operating system by providing early detection of emission-related faults. The engine control unit (ECU) will manage smart sensors located throughout the engine and after-treatment system. The system shall monitor component verification and sensor operation. There shall be warning lights located in the dash instrument panel to alert the operator of a malfunction. A data port shall be provided under the driver's side dash for the purpose of code reading and troubleshooting. All communication shall be provided through the J1939 data link.

**ENGINE WARRANTY**

The engine shall have a five (5) year or 100,000 mile warranty and approval by Cummins Diesel for Full Engine Coverage Plan (RVF) – which is their most complete engine coverage plan, which includes EGR components installation in the chassis. There shall be no deductible for the first two years. A one hundred dollar deductible shall apply for service beginning the third year.

**AFTERTREATMENT WARRANTY**

The engine shall have a five (5) year or 100,000 mile aftertreatment coverage warranty, which covers failures of the Aftertreatment Assembly which result, under normal use and service, from a defect in Cummins material or factory workmanship.

**AIR CLEANER/INTAKE**

The engine air intake and filter shall be designed in accordance with the engine manufacturer's recommendations. It shall be 99.9% effective in removing airborne contaminants when tested per the industry standard SAE J726 procedure and offer a dirt holding capacity of at least 3.0 gm/cfm of fine dust (tested per SAE J726) offering superior engine protection.

The air filter shall be located at the front of the apparatus and shall be at least 66” above the ground, to allow fording deep water in an emergency situation.

An ember separator shall be provided in the engine air intake meeting, the requirements of NFPA 1901.

An Air Restriction warning light shall be provided and located on the cab dash.

**PRIMARY FUEL FILTER/WATER SEPARATOR**

A Cummins approved Fleetguard Fuel Pro FH230 fuel filter/water separator shall be remote mounted to the chassis frame rail.

**12VDC HEATER**

A 12V DC heater shall be provided for the Fleetguard Fuel Pro FH230 fuel filter/water separator.

**SECONDARY FUEL FILTER**

A Cummins approved Fleetguard FF5776 fuel filter will be mounted on the driver’s side of the engine.

**TRANSMISSION**

The chassis shall be equipped with a Generation 6 Allison EVS4500 six (6) speed automatic transmission. It shall be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine.

The transmission is communicated on the J-1939 through the communication port. The fifth gear shall be an overdrive ratio, permitting the vehicle to reach its top speed at the engine's governed speed. The dipstick is dipped in a rubber coating for ease in checking oil level when hot.

The chassis to transmission wiring harness shall utilize Metri-Pack 280 connectors with triple lip silicone seals and clip-type positive seal connections to protect electrical connections from contamination without the use of coatings.

Ratings: Max Input (HP) 600
Max Input (Torque) 1850 (lb ft)
Max Turbine (Torque) 2600 (lb ft)

Mechanical Ratios: 1st – 4.70:1

2nd – 2.21:1
3rd - 1.53:1
4th - 1.00:1
5th - 0.76:1
Reverse - -5.55:1

**TRANSMISSION FLUID**

The transmission shall come filled with an Allison approved Synthetic Transmission Fluid that meets the Allison TES-295 specification.

**ENGINE BRAKE**

The engine shall be equipped with a Jacobs compression engine brake. An “On/Off” switch and a control for “Low/High” shall be provided on the instrument panel within easy reach of the driver.

The engine brake shall interface with the Wabco ABS brake controller to prevent engine brake operations during adverse braking conditions.

A pump shift interlock circuit shall be provided to prevent the engine brake from activating during pumping operations.

The brake light shall activate when the engine brake is engaged.

**TRANSMISSION COOLER**

The apparatus transmission shall be equipped with a Liquid-To-Liquid remote mounted cooler with aluminum internal components. The cooler shall be encased in an aluminum housing and mounted to the outside of the officer’s side frame rail for accessibility and ease of service.

**TRANSMISSION SHIFTER**

An Allison "Touch Pad" shift selector shall be mounted to the right of the driver on the engine cover accessible to the driver. The shift position indicator shall be indirectly lit for nighttime operation.

**COOLING SYSTEM**

The cooling system shall be designed to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer's requirements, and EPA regulations.

The complete cooling system shall be mounted in a manner to isolate the system from vibration and stress. The individual cores shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress to the adjoining core(s).

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler, bolted to the top of the radiator to maximize cooling, recirculation shields, a shroud, a fan, and required tubing. All components shall consist of an individually sealed system.

**RADIATOR**

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall be bolted to the bottom of the charge air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

The radiator shall be equipped with a drain cock to drain the coolant for serviceability. The drain cock shall be located at the lowest point of the aluminum cooling system to maximize draining of the system.

**CHARGE AIR COOLER**

The charge air cooler shall be of a cross-flow design and constructed completely of aluminum with extruded tanks. The charge air cooler shall be bolted to the top of the radiator to allow a single depth core.

**COOLANT**

The cooling system shall be filled with a 50/50 mix. The coolant makeup shall contain ethylene glycol and de-ionized water to prevent the coolant from freezing to a temperature of –34 degrees F.

**HOSES & CLAMPS**

Silicone hoses shall be provided for all engine coolant lines.

All radiator hose clamps shall be spring loaded stainless steel constant torque hose clamps for all main hose connections to prevent leaks. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

**FAN**

The engine cooling system shall incorporate a heavy-duty composite 11- blade Z-series fan. It shall provide the highest cooling efficiently while producing the lowest amount of noise. This robust yet light-weight fan results in less wear and stress on motors and bearings.

A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through again.

The fan tip to radiator core clearance shall be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

**FAN CLUTCH**

A fan clutch shall be provided that shall allow the cooling fan to operate only when needed. The fan shall remain continuously activated when the truck is placed in pump gear.

**SURGE TANK**

The cooling system shall be equipped with an aluminum surge tank mounted to the officer's side of the cooling system core. The surge tank shall house a low coolant probe and sight glass to monitor the coolant level. Low coolant shall be alarmed with the check engine light. The surge tank shall be equipped with a dual seal cap that meets the engine manufacturer's pressure requirements, and system design requirements.

The tank shall allow for expansion and to remove entrained air from the system. There shall also be an extended fill neck to prevent system overfill and encroachment of expansion air space. Baffling shall be installed in the tank to prevent agitated coolant from being drawn into the engine cooling system.

**FUEL TANK**

The chassis shall be equipped with a 65-gallon rear mounted, behind the rear axle, rectangular fuel tank that shall be constructed of steel. The fuel tank shall be certified to meet FMVSS 393.67 tests. It shall also maintain engine manufacturer's recommended expansion room of 5%.
There shall be two (2) tank baffles.

Dual pick-up and return ports shall be provided for diesel generators if required.
The fuel lines shall be nylon braid reinforced fuel hose with brass fittings. The lines shall be carefully routed along the inside of the frame rails. All fuel lines are covered in high temperature rated split plastic loom. Single suction and return fuel lines shall be provided.
The bottom of the fuel tank shall contain a 1/2" drain plug.

**DUAL FUEL FILLS**

The fuel tank shall be equipped with two (2) 2-1/4" filler neck assemblies with a 3/4" vent, one located on the driver's side and one on the officer's side of the truck. A fuel fill cap attached with a lanyard shall be provided for each fill.

**FUEL COOLER**

Installed on the apparatus fuel system shall be an Air-To-Liquid aluminum fuel cooler. The fuel cooler shall be located in the lowest module of the cooling system.

**DIESEL EXHAUST FLUID TANK**

The exhaust system shall include a molded cross linked polyethylene tank. The tank shall have a capacity of 5 usable gallons and shall be mounted on the left side of the chassis frame.
The DEF tank fill neck shall accept only a 19mm dispensing nozzle versus the standard 22mm diesel fuel dispensing nozzle to prevent cross contamination. The DEF tank cap shall be blue in color to further prevent cross contamination.

A placard shall accompany fill location noting DEF specifications.

**ALTERNATOR**

A 430 ampere Delco-Remy alternator shall be provided. The alternator shall be serpentine belt driven.

**LOW VOLTAGE ALARM**

A Floyd Bell TXB-V86-515-QF low voltage alarm, audible and visual, shall be provided.

**BATTERIES**

The battery system shall be a single system consisting of four (4) negative ground, 12 volt Interstate Group 31 MHD batteries, cranking performance of 950 CCA each with total of 3800 amps, 185 minute reserve capacity with 25 ampere draw at 80 degrees Fahrenheit. Each battery shall have 114 plates. The batteries shall include a one-year warranty which shall be accepted nationwide.

The batteries shall be installed in a vented 304 stainless steel battery box with a removable aluminum cover to protect the batteries from road dirt and moisture. The battery cover shall be secured with four "T" handle rubber hold downs to provide easy access for maintenance and inspection. Stainless steel hardware will be used for installation. The batteries are to be placed on dri-deck and secured with a fiberglass hold down. The batteries shall be wired directly to starter motor and alternator.

The battery cables shall be 3/0 gauge. Battery cable terminals shall be soldering dipped, color-coded and labeled on heat shrink tubing with a color-coded rubber boot protecting the terminals from corrosion.

There shall be a 350-ampere fuse protecting the pump primer and a 250-ampere fuse protecting the electric cab tilt pump and other options as required.

**BATTERY JUMPER TERMINAL**

There shall be one set (two studs) of battery jumper terminals located by the battery box under the cab. The terminals shall have plastic color-coded covers. Each terminal shall be tagged to indicate positive/negative. Battery jumper terminals to be installed under drivers side battery box.

**BATTERY CHARGER**

An IOTA DLS-45 45 amp battery charger with IQ-3 controller shall be provided and installed in the cab. The charger shall be wired to the 120V shoreline inlet.

**KUSSMAUL PUMP PLUS STATUS CENTER DISPLAY, 091-198-12-PP**

**STAINLESS PLATE BEHIND KUSSMAUL EJECT INLETS**

**FRONT AXLE**

A Hendrickson STEERTEK NXT non-driving, front steer axle with a capacity of 24,000 pound shall be provided. The axle shall have a 3.74" drop and will have a fabricated boxed shaped cross section, a one piece knuckle, and serviceable king pin. Adjustable Ackerman settings shall be available, and determine based on wheelbase. The axle shall have 10 bolt hub piloted, and furnished with oil seals.

**SUSPENSION (FRONT)**

The front suspension shall be a parabolic taper-leaf spring design, 56" long and 4" wide. Long life, maintenance free, threaded pin bushings in spring shackles shall be utilized. All spring and suspension mounting shall be attached directly to frame with high strength Huck bolts and self-locking round collars. Progressive rate bump stop and custom tuned passive hydraulic damper shall be supplied. NO EXCEPTIONS.

**FRONT SUSPENSION LOCKING CYLINDERS**

Two (2) hydraulic suspension-locking cylinders shall be provided. The cylinders shall be mounted to the chassis frame rails directly above the front axle. The cylinders shall be manually operated from the outrigger control station.

**FRONT SUSPENSION LOCKOUT PLATE**

The front suspension shall be provded with a lockout plate that limits the travel of the front suspension when the front suspension jack has been engaged.

**STEER ASSIST**

The steer assist provides driver assistance when turning the vehilce left or right while traveling.

**REAR AXLE**

The rear axle shall be a Meritor™ RT-50-180 Tandem drive axle with a capacity of 52,000 lbs. The axles shall be hub piloted, 10 studs, furnished with oil seals.

**INTER-AXLE DIFFERENTIAL LOCK**

A locking inter-axle differential shall be provided between the two rear axles. An activation switch shall be provided on the driver’s dash.

**TOP SPEED**

The top speed shall be approximately 60 MPH.

**INTER-AXLE CONTROLLED DIFFERENTIAL LOCK**

A locking inter-axle differential shall be provided between the two rear axles. An activation switch shall be provided on the driver's dash.

**SUSPENSION (REAR)**

52,000 TANDEM AIR RIDE
The rear suspension shall be a Raydan Manufacturing, Air Link™ model 952-52-199 air ride suspension. This suspension shall incorporate a quad air spring system. The air suspension bags shall have internal rubber stops giving the ability to operate without air if the need arises. Heavy-duty shock absorbers shall be provided, inboard mounted, to dampen load forces, reduce tire hops, and improve stopping. Torque rods shall be incorporated to restrict lateral movement of the differentials and to reduce bushing and tire wear. Dual height control valves shall be provided to maintain even, balanced loads. Suspension shall have a ground rating of 52,000 pounds.

**REAR TIRES**

Rear tires shall be Goodyear 12R22.5, load range H, G622 Mud and Snow tread, dual tubeless type with a GAWR up to 52,000 pounds. Wheels shall be disc type, hub piloted, 22.5 x 8.25 10 stud with 11.25" bolt circle.

**TIRE PRESSURE MONITOR**

A Real Wheels LED tire pressure sensor shall be provided for each of the front wheels and a Crossfire tire pressure sensor shall be provided for each set of the dual rear wheels. The pressure sensors shall indicate if a particular tire or set of tires is not properly inflated. A total of six (6) indicators shall be provided.

**WHEELS**

The front and rear wheels shall be ACCURIDE® brand aluminum. ACCU-SHIELD™ finish shall be provided on the front and outside-rear wheels.

**HUB COVERS**

Polished stainless steel hub covers shall be provided for the front and rear axle.

**LUG NUT CAPS**

Chrome plated lug nut caps shall be provided for the front and rear wheels.

**FRONT MUD FLAPS**

Hard rubber mud flaps shall be provided for front tires.

**REAR MUD FLAPS**

Hard rubber mud flaps shall be provided for the rear tires.

**BRAKES, Front**

The front brakes shall be Arvin Meritor DiscPlus EX225 Air Disc Brakes. Each disc brake assembly shall include one (1) 17” vented rotor, one (1) lightweight hub, one (1) twin-piston caliper, and two (2) quick-change pads.

**BRAKES, Rear**

The rear brakes shall be Meritor S-cam style. They shall be 16.5" x 8.625" with heavy duty return springs, and a double anchor pin design. They shall also have quick change shoes for fast easy brake relining.

A guard shall be provided over the parking brake knob.

**AIR BRAKE SYSTEM**

The vehicle shall be equipped with air-operated brakes. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 standards.

Each wheel shall have a separate brake chamber. A dual treadle valve shall split the braking power between the front and rear systems.

All main brake lines shall be color-coded nylon type protected in high temperature rated split plastic loom. The brake hoses from frame to axle shall have spring guards on both ends to prevent wear and crimping as they move with the suspension. All fittings for brake system plumbing shall be brass.

A Meritor Wabco System Saver 1200 air dryer shall be provided.

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. The system shall be designed so the vehicle can be moved within 60 seconds of startup. The quick build up system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time. The vehicle shall not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Six (6) supply tanks shall be provided. One air reservoir shall serve as a wet tank and a minimum of one tank shall be supplied for each the front and rear axles. A Schrader fill valve shall be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake shall be provided on the rear axle. One (1) parking brake control shall be provided and located on the engine hood next to the transmission shifter within easy reach of the driver. The parking brake shall automatically apply at 35 ±10 PSI reservoir pressure. A Meritor WABCO IR-2 Inversion Relay Valve, supplied by both the Primary and Secondary air systems, shall be used to activate the parking brake and to provide parking brake modulation in the event of a primary air system failure.

Accessories plumbed from the air system shall go through a pressure protection valve and to a manifold so that if accessories fail they shall not interfere with the air brake system.

**AIR BRAKE SYSTEM RELEASE VALVE**

The vehicle shall be equipped with air-operated Haldex air brake release valve located in the cab within an accessible reach to the driver.

**AUTOMATIC HEATED MOISTURE EJECTORS**

Each air tank in the chassis braking system shall consist of a heated automatic moisture ejector to assist in keeping the air tanks and air lines free of debris and moisture. A manual pull cable shall be incorporated.

**AIR INLET**

An air system inlet/fill connection shall be provided. The inlet shall be connected to the air brake to allow constant air feed. The location of the inlet shall be on the left hand side of the driver's step well.

**ELECTRONIC STABILITY CONTROL SYSTEM**

An Arvin Meritor / Wabco Electronic Stability Control (ESC) system shall be provided and installed. The ESC system continually monitors the vertical acceleration, and yaw (horizontal plain rotation) of the vehicle, and compares it to a critical threshold where vehicle rollover may occur. When the critical threshold is met, the ESC shall intervene by reducing engine torque and engaging the engine retarder, while automatically applying both the steering and drive axle brakes as needed. In many cases, activation occurs before the driver is even aware it is needed.

There will be a switch on driver side of dash to activate or deactivate the ASR.

**AIR BRAKING ABS SYSTEM**

A Wabco ABS system shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to axles and all electrical connections shall be environmentally sealed from water and weather and be vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall sense approaching wheel lock and instantly modulate brake pressure up to 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. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall indicate malfunction to the operator.

The system shall consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip shall hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit shall monitor the speed of each wheel sensor and a microcomputer shall evaluate in wheel slip in milliseconds.

**AUTOMATIC SLIP RESPONSE**

The Rockwell/Wabco 4 Channel Anti-lock braking system shall be provided with six (6) sensors. The system shall be supplied with (ASR) Automatic slip response. The ASR controls slip under acceleration.

**ASR SWITCH**

An on/off switch for the Acceleration Slip Resistance shall be provided on the dash. This will allow the driver to override the computer and turn the ASR on when at a higher speed for better traction in deep snow or mud.

**COMPRESSION FITTINGS ON AIR SYSTEM**

All air line fittings installed on the chassis shall be compression style fittings.
The following locations shall utilize push-on fittings:

- Pressure protection valve (accessory block)
- Double check valve (braking system, park brake)
- One way check valve (brake valve tank)
- Elbow Male Modified 1/4" tube x 1/4" MP (low air switch)
- Elbow Male 1/4" tube x 3/8"MP (brake pedal solenoid)
- Connector 1/4" x 3/8"MPT (brake pedal solenoid)
- Switch stoplight (Wabco sealed switch/brake light and service brake switch)
- Low pressure switch (PTC) (Wabco sealed switch/low air switch)

**MISCELLANEOUS CHASSIS EQUIPMENT**

Fluid capacity plate affixed below driver's seat.
Chassis filter part number plate affixed below driver's seat.
Maximum rated tire speed plaque near driver.
Tire pressure label near each wheel location.
Cab occupancy capacity label affixed next to transmission shifter.
Do not wear helmet while riding plaque for each seating position.
NFPA compliant seat belt and standing warning plates provided.

**ALUMINUM CAB**

The cab shall be a full tilt 8-person cab designed specifically for the fire service and manufactured by the chassis builder. Rear of the cab shall be slanted forward at the top rear for mid-ship aerial use. The outside of the rear cab wall shall be aluminum diamond plate.

Apparatus cabs that are not manufactured by the apparatus manufacturer shall not be acceptable.

**CAB DESIGN**

The apparatus chassis shall be of an engine forward, fully enclosed tilt cab design. There shall be four (4) side entry doors.

The cab shall be of a fully open design with no divider wall or window separating the front and rear cab sections. The cab shall be designed in a manner that allows for the optimum forward facing vision for crew. Cab designs that utilize roof mounted air conditioning units, are not desired.

The cab shall be constructed of high strength 5052H32 aluminum plate welded to 6061-T6 extruded aluminum framing.

The cab roof shall utilize 5” x 5” honeycomb re-enforced 6061 T6 aluminum extrusion, with fully radiused outer corner rails with integral drip channel and 6061 T6 ¾” x 2” x 3/16” aluminum box tubing type cross brace supports. Structures that do not include an integral drip channel will not be accepted. The box tubing type cross brace supports shall be installed in a curved fashion beginning from the midline of the apparatus cab and curving toward the exterior corner rails. This curvature will allow for increased strength in the event of a roll over while not allowing for rainwater buildup on the apparatus cab roof.

The cab sides shall be constructed from 1 ½” x 3” x 3/16” 6061 T6 extruded door pillars and posts that provide a finished door opening, extruded and formed wheel well openings supports, formed aluminum wheel well liners and box tubing type support braces.

The cab floor and rear cab wall shall utilize 1 ¾” x 4” x 3/16” 6061 T6 extruded box tubing type framing and support bracing.

The framework shall be of a welded construction that fully unitizes the structural frame of the cab.

The structural extrusion framework shall be overlaid with interlocked aluminum alloy sheet metal panels to form the exterior skin of the cab. The cab sides shall be constructed of 3/16” thick 5052H32 aluminum plate that slides into an integral channel of the extrusion framework. The plate is then skip welded into that channel to allow for tolerable flex while the apparatus travels down the roadway. Cab designs that utilize 1/8” thick aluminum for the cab sides shall not be acceptable.

The structural extrusion framework shall support and distribute the forces and stresses imposed by the chassis and cab loads and shall not rely on the sheet metal skin for any structural integrity.

The cab face extrusion framework shall be overlaid with 1/8” thick 5052H32 aluminum plate to allow for an aesthetically pleasing radiused cab face.

**CAB SUB-FRAME**

The cab shall be mounted to a 4” x 4” x 3/8” steel box tube sub-frame, and shall be isolated from the chassis, through the use of no less than six (6) elastomeric bushings. This substructure shall be completely independent of the apparatus cab. The sub frame shall be painted to match the primary chassis color.

The sub-frame shall be mounted to the chassis through the use of lubricated Kaiser Bushings for the front pivot point, and two (2) hydraulically activated cab latches, to secure the rear.

Cab mounting that does not include a sub-frame shall not be considered. NO EXCEPTIONS.

**CAB DIMENSIONS**

The cab shall be designed to satisfy the following minimum width and length dimensions:
Cab Width (excluding mirrors) 98"
Cab Length (from C/L of front axle)
To front of cab (excluding bumper) 68"
To rear of cab 73"
Total Cab Length (excluding bumper) 141"

**ROOF DESIGN**

The cab shall be of a flat roof design with side drip rails and shall satisfy the following minimum height dimensions:

Cab Dimensions Interior
Front 59"
Rear 55"

Cab Dimensions Exterior
Front 65"
Rear 65"

**FENDER CROWNS**

Polished stainless steel front axle fenderettes with full depth radiused wheel well liners shall be provided.

**CAB INSULATION**

The exterior walls, doors, and ceiling of the cab shall be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels shall not exceed 90 decibels at 45 mph in all cab seat positions. NO EXCEPTIONS

**EXTERIOR GLASS**

The cab windshield shall be of a two piece curved design utilizing tinted, laminated, automotive approved safety glass. The window shall be held in place by an extruded rubber molding. The cab shall be finished painted prior to the window installation.

**SUN VISORS**

The sun visors shall be made of dark smoke colored transparent polycarbonate. There shall be a visor located at both the driver and officer positions, recessed in a molded form for a flush finish.

**CAB STEPS**

The lower cab steps shall be no more than 22" from the ground. An intermediate step shall be provided, mid way between the lower cab step, and the cab floor.

The intermediate step shall be slightly inset to provide for safer ingress and egress. All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

**STEP LIGHTS**

A white LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.

**CAB STRUCTURAL INTEGRITY**

The cab of the apparatus shall be designed and so attached to the vehicle as to eliminate, to the greatest possible extent, the risk of injury to the occupants in the event of an accident.

The apparatus cab shall be tested to specific load and impact tests with regard to the protection of occupants of a commercial vehicle.

A test shall be conducted to evaluate the frontal impact strength of the apparatus cab to conform to the test J2420 and the “United Nations Regulation 29, Annex 3, paragraph 4, (Test A). A second test shall be conducted to evaluate the roof strength of the apparatus cab to conform to the Society Of Automotive Engineers (SAE) SAE J2422/SAE J2420 and “United Nations Regulation 29, Annex 3, paragraph 5, (Test B) and SAE J2420. The evaluation shall consist of the requirements imposed by ECE Regulation 29, Paragraph 5.

The test shall be conducted by a certified independent third party testing institution.

A letter stating successful completion of the above test on the brand of cab being supplied shall be included in the bid. There shall be “no exception” to this requirement.

**SEAT BELT TESTING**

The seat belt anchorage system shall be tested to meet FMVSS 207 Section 4.2a and FMVSS 210 section 4.2. Testing shall be conducted by an independent third party product evaluation company.

A copy of the certification letter shall be supplied with the bid documents.

**CAB LOCKDOWN LATCHES**

Cab lockdown latches shall be provided with an interlock switch tied to a component as specified. A LED indicator light shall be located in the cab. Once the component's path is clear and the cab tilt switch is engaged, the cab latches will released to allow the cab to be tilted.

**CAB TILT SYSTEM**

An electrically powered hydraulic cab tilt system shall be provided and shall lift the cab to an angle of 45 degrees, exposing the engine and accessories for fluid checks and service work. The system shall be interlocked to only operate when the parking brake is set.

The lift system shall be comprised of two (2) hydraulic lift cylinders, an electrically driven hydraulic pump, and a control switch. The hydraulic pump shall be located on the exterior of the frame rail on the driver’s side of the chassis that can be easily accessible when the cab is tilted. A mechanical locking system consisting of an air operated actuator and a heavy radiused wall 3” x 3” aluminum extrusion will be provided to ensure the cab remains in the raised position in the event of a hydraulic failure. Additionally, each of the hydraulic lift cylinders shall incorporate a check valve, and velocity fuses that will activate should a sudden drop in pressure be detected. The cab tilt controls shall be interlocked to the parking brake to ensure the cab will not move, unless the parking brake is set. The cab tilt controls will consist of a momentary raise/lower switch and a two position cab safety lock switch.

The hydraulic lift cylinders will be connected to a steel cab sub-frame, and not directly to the cab. NO EXCEPTIONS

**MANUAL CAB LIFT**

There shall be a manually operated hydraulic pump for tilting the cab in case the main pump should fail. Access to the pump shall be located under the left corner of the front bumper.

**BARRIER STYLE CAB DOORS**

Barrier style cab doors shall be provided. The lower part of the door shall be removed to expose the cab entry step well. The step well shall be lined with aluminum treadplate.

*The lower step wells to be covered with treadplate on all three sides. Coat behind the step treadplate with urethane coating like previous columbus units.

The cab doorframes shall be constructed from 6061 T6 aluminum extrusions fitted with a 5052 H32 aluminum sheet metal skin and shall be equipped with dual weather seals. The outside cab door window opening shall be framed by a black anodized aluminum trim, to provide a clean appearance. The cab doors shall be equipped with heavy-duty door latching hardware, which complies with FMVSS 206. The door latch mechanism shall utilize control cable linkage for positive operation. A rubber coated nylon web doorstop shall be provided.

The doors shall be lap type with a 10 gauge full-length stainless steel flange and 3/8" diameter hinge pin and shall be fully adjustable.

All openings in the cab shall be grommeted or equipped with rubber boots to seal the cab from extraneous noise and moisture.

The cab doors shall be designed to satisfy the following minimum opening and step area dimensions:
Door Opening:

| | |
|---|---|
| Front | 36.5" x 73" |
| Rear | 36.5" x 73" |

**STEP WELLS**

The lower cab step wells shall be sprayed with a Raptor urethane blend, matching truck color. The back and side walls of the step well shall also be lined with 1/8” aluminum treadplate.

**CAB STEPS**

The lower cab steps shall be no more than 22" from the ground. Grip strut material shall be installed on the stepping surface.

An intermediate step shall be provided, mid way between the lower cab step, and the cab floor. The intermediate step shall be slightly inset to provide for safer ingress and egress. Diamondplate material shall be installed on the stepping surface.

All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

**AUXILIARY CAB STEPS**

There shall be one additional step under each cab door to assist with entrance and exit of the cab. The steps shall be constructed of aluminum with a grip strut stepping surface.

**STEP LIGHTS**

A white TecNiq E45 LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.

**POWER WINDOWS**

All four cab entry doors shall have power windows. Each door shall be individually operated and the driver's position shall have master control over all windows. All four windows shall roll down completely.

**SIDE WINDOWS**

Fixed position side window shall be provided on each side of the cab between the forward cab area and the crew cab area. The widows shall be approximately 20.5" high x 16.50" wide to provide maximum visibility. The side windows shall be held in place by an extruded rubber molding with a chrome plated decorative locking bead.

**WINDSHIELD WIPERS**

Two (2) black anodized finish two speed synchronized electric windshield wiper system. Dual motors with positive parking. System includes large dual arm wipers with built in washer system. One (1) master control works the wiper, washer and intermittent wipe features. Washer bottle is a remote fill with a 4 quart capacity. Washer fill is located just inside of officer cab door.

**WINDSHIELD WASHER RESERVOIR**

A four quart capacity windshield washer reservoir shall be provided. The fill access shall be located in the forward officer's step well area.

**MIRRORS**

Two (2) Lang Mekra 300 Series smooth chrome plated Aero style main and convex mirrors shall be installed on each side of the vehicle. The main mirror shall be 4-way remote adjustable with heat, 7" x 16" 2nd surface chromed flat glass. The convex shall be 6" x 8" 2nd surface chromed 400 mm radius glass. Each mirror housing assembly shall be constructed of lightweight textured chrome ABS with on truck glass and housing back cover replacement. In the event the mirror breaks the glass shall be replaceable in (3) minutes or less. The glass shall include a safety adhesive backing to keep broken glass in place. The mirror assembly shall be supported by a "C" loop bracket constructed of polished stainless steel tube utilizing two point mounting reducing vibration of mirror glass during normal vehicle operation. The lower section of the holder shall include a spring loaded single detent position 20 degrees forward with easy return to operating position without refocusing.

**MIRROR, BLIND SPOT**

One (1) Velvac 8" diameter exterior blind spot mirror assembly shall be provided and mounted on the brow of the cab, officer's side.

**OUTRIGGER MIRROR, OFFICER'S SIDE**

One (1) Truck-Lite 12" diameter convex mirror shall be provided and mounted on the rear wall of the cab, officer's side, for the purpose of viewing the officer's side outrigger from the outrigger controls in the L1 compartment area.

**GRILLE**

The front of the cab shall be equipped with a polished stainless steel grille with sufficient area to allow proper airflow into the cooling system and engine compartment. Plastic chrome plated grilles shall not be acceptable.

**UPPER GRILLE LOGO**

The upper grille shall have a laser cut flaming "S" logo in the upper portion of the grille. The cut out shall contain reflective material behind.

**LOWER GRILLE**

The front of the cab shall be equipped with a polished stainless steel lower grille The design shall allow proper airflow into the cooling system and engine compartment. Plastic chrome plated lower grille shall not be acceptable.

**PRO TEC**

The vertical edges of the exterior compartment will have pro tec to protect against scuffs from tools entrance into the compartment.

**RUBBER WHEEL TRIM FENDERETTES FRONT AND REAR AXLES**

**PAINTED STEEL BUMPER**

There shall be a 12" high painted formed steel wrap-around (45 degree) bumper provided at the front of the apparatus. The bumper shall be mounted to a reinforcement plate constructed of 1/4" x 12" x 70" carbon steel. The frame rail extension shall be a reinforced four-sided boxed frame rail for superior safety protection. A gravel shield shall be provided, constructed of .188” aluminum diamond plate. The bumper extension shall be approximately 12".

**BUMPER SIDES**

The sides of the bumper shall also be painted steel in lieu of diamond plate. Each side shall feature a recessed painted steel pocket for the marker light and any auxiliarly lighting option selected. The pocket shall be a welded integral part of the bumper skin.

**PROTECTIVE BUMPER COATING**

A Raptor texture coating shall be provided along the top edge of the front steel bumper. The color of the coating shall be determined at precon.

**BUMPER NOTCH**

The following located on driver side will be a federal Q2B Flush mounted recess in front bumper.

**AIR HORNS**

Two (2) Grover 1512 round, 21" long chrome plated air horns shall provided.

**AIR HORNS WIRED TO STEERING WHEEL**

The air horns shall be wired through the steering wheel button. A selector switch shall be provided on the instrument panel to switch between functions.

**LANYARD CONTROL FOR AIR HORNS**

The air horns shall be activated by a split "Y" lanyard in cab ceiling.

**ELECTRONIC SIREN**

One (1) Whelen 295HFSA7 electronic siren shall be installed at the cab instrument panel complete with noise canceling removable microphone. The remote control head shall be flush mounted in a location specified by the fire department.

**SIREN SPEAKERS**

Two (2) Whelen SA314A 100 watt weatherproof aluminum siren speakers with epoxy-coated finish shall be provided and wired to the electronic siren. THey will be located in 45 Degree angles.

**SPEAKER MOUNTING**

The electronic siren speaker(s) shall be installed behind perforations in the front bumper.

**FEDERAL Q2B SIREN**

There shall be a Federal Q2B-NN siren installed on the face of the front bumper. The siren shall be securely mounted and activated by means of a solenoid and shall include a brake. There shall be rubber dock bumpers on each side of the Q2B siren to prevent damage to the siren grille.

**FOOT SWITCH, DRIVER'S SIDE**

A foot switch for the mechanical siren shall be provided on the driver's side.

**MOMENTARY SWITCH ON DASH**

A momentary switch for the mechanical siren shall be provided on the officer's side dash.

**SIREN BRAKE SWITCH**

A brake switch for the mechanical siren shall be provided in the lower command console for both the driver's and officer's position.

**CAB EXTERIOR LIGHTING**

Exterior lighting and reflectors shall meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements.

**HEADLIGHTS**

The front low and high beam headlights shall be FIRETECH model FT-4X6 LED, rectangular shaped, quad style installed in custom rectangular shaped stainless steel housings on the front of the cab. Each housing shall accommodate a forward-facing turn signal in the outboard location and a side-facing warning light.

An additional pair of rectangular shaped stainless steel housings shall be installed on the front of the cab above the headlight housings. Each housing shall accommodate two (2) forward-facing warning lights and a side-facing turn signal.

**HEADLIGHT FINISH**

The interior components of the headlights shall have a chrome finish.

**FRONT TURN SIGNALS**

There shall be two Whelen 400 Series LED rectangular amber turn signal lights mounted one each side in the front of the headlight housing and one mounted on each side of the warning light housing.

**CORNERING LIGHTS**

Two (2) Whelen Model M6 LED cornering lights shall be mounted on the sides of the bumper, one each side. The lights shall come on steady with their coordinating turn signal.

**ICC/MARKER LIGHTS**

Five (5) Grote 47183 ICC/ LED marker lights shall be provided on top of the roof of the cab to meet D.O.T. requirements.

**EXTERIOR CAB HANDRAILS**

There shall be four (4) 24" long, handrails provided and installed, one at each cab entrance. The handrails shall be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges. The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange.

Sufficient space shall allow for a gloved hand to firmly grip the rail.

**HANDRAIL SCUFF PLATES**

Four (4) 4" wide mirrored stainless steel scuff plate shall be provided, one behind each of the exterior grab handles.

**COAT HOOKS FOR GRAB HANDLES**

There shall be a coat hook installed on the lower portion of the two exterior cab handrails, on the driver's side, for hanging of coats, turnout gear, etc.

**COAT HOOKS FOR GRAB HANDLES**

There shall be a coat hook installed on the lower portion of the two exterior cab handrails, on the officer's side, for hanging of coats, turnout gear, etc.

**HANDRAILS, FRONT OF CAB**

There shall be a pair of knurled stainless steel handrails on the front face of the cab, below the windshields.

**INTERIOR CAB HANDRAILS**

There shall be two (2) rubber coated grab handles provided and mounted on the interior of the cab, one each side, on the windshield post for ingress assistance. The handrail on the driver's side shall be approximately 11" long and the handrail on the officer's side shall be approximately 18" long.

**CAB DOOR HANDRAILS**

There shall be two (2) rubber coated grab handles provided and mounted, one on the inside of each rear crew door, just below the windowsill. The handrails shall be approximately 11" long.

There shall also be two (2) 1.25" diameter knurled stainless steel handrails shall be provided and mounted, one on the inside of each rear crew door, just above the windowsill. The handrails shall be approximately 22" long.

**INTERIOR DOOR STRAP**

A nylon strap shall be provided on the lower hinge of each interior cab door to assist with entry.

**CAB REAR WALL COVERING**

The rear outside wall of the cab shall be covered with 1/8" aluminum diamond plate.

**EXTERIOR DOOR**

The exterior compartment shall have a hinged door. The door shall have an Austin Hardware slam catch single-point "D"-ring door closure and held open with gas struts.

**DOOR HINGE**

The door shall be hinged to open towards the front of the cab.

The interior back wall of the cab and the side walls near the forward-facing crew seats shall be covered with 3/16" smooth aluminum.

Undercoating shall be provided on the interior of the cab doors to aid in noise reduction and corrosion prevention.

**DRIVER'S SIDE EXTERIOR CAB COMPARTMENT**

There shall be a cabinet constructed of .125 aluminum plate recessed in the cab behind driver's side rear crew door. The compartment shall be approximately 38" high x 15" wide x 22.25" deep.

The compartment shall have a hinged door that is hinged at the front. The doors shall have an Austin Hardware slam catch single-point "D"-ring door closure and held open with gas struts.

The compartment shall be operated by an individual switch and illuminated with (1) LED light.

**OFFICER'S SIDE CAB COMPARTMENT**

There shall be a cabinet constructed of .125 aluminum plate recessed in the cab behind officer's side rear crew door. The compartment shall be approximately 38" high x 15" wide x 20.25" deep (12.75" deep if front suction)

The compartment shall have a hinged door that is hinged at the front. The doors shall have an Austin Hardware slam catch single-point "D"-ring door closure and held open with gas struts.

The compartment shall be operated by an individual switch and illuminated with (1) LED light.

**ACCESS TO CREW SEAT RISER**

The exterior cab compartment on the driver's side shall be open to the crew cab seat compartment.

**PIKE POLE STORAGE COMPARTMENT**

The transverse compartment shall be provided with storage for up to two (2) pike poles mounted on the back wall. The pike pole compartment shall be approximately 7" wide x 10" high x 84" long.

**DIAMOND PLATE, CAB ROOF**

The rear exterior section roof of the cab shall have a diamond plate overlay. The overlay shall be constructed of .125” aluminum embossed diamond plate and measure 56” x 91”.

**CAB INTERIOR**

The metal surfaces of the cab interior shall be coated and sealed with MultiSpec black speckle, urethane modified, mar resistant paint. The textured coating shall provide paramount durability and wear resistance against foreign objects and normal wear and tear.

The front and rear headliners, as well as the rear cab wall, shall be finished in Gray-Black Durawear covered padded panels.

**INTERIOR DOOR PANELS**

The interior of the cab entry doors shall have a 304 brushed stainless steel scuff plate, contoured to the door, from the door window sill down.

**REFLECTIVE MATERIAL, CHEVRON STRIPING, INTERIOR CAB DOORS, 3M SCOTCHLITE**

The apparatus shall have reflective 3M Scotchlite.
LAD?DER
Refelective like rescues.

**CAB FLOOR COVERING**

The cab interior floor shall be covered with a 5/16” thick, black rubberized material to provide a rugged but cosmetically pleasing stepping surface throughout the cab. The floor covering shall provide superior durability and resistance against foreign objects as well as normal wear and tear.

**DIAMOND PLATE, CAB FLOOR**

The cab floor shall be covered with 1/8" embossed diamondplate.

**ENGINE ENCLOSURE**

An integral, formed aluminum and composite engine enclosure shall be provided. The engine enclosure shall be contoured and blended in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure shall be kept as low as possible, to maximize space and increase crew comfort.

The enclosure shall be constructed from 5052 H2 aluminum plate and GRP composite materials, providing high strength, low weight, and superior heat and sound deadening qualities.

Additionally, the underside of the engine enclosure shall be coated in with a ceramic spray on insulation and sound control. This coating is an environmentally-friendly coating that is applied seamlessly and rapidly while providing superior thermal insulation and protection against vibration and noise, and will prevent future corrosion from forming by sealing the substrate. NO EXCEPTIONS

**ENGINE ENCLOSURE COVERING**

The top of the engine enclosure shall be covered with Scorpion heavy duty, black polyurethane blended coating. The textured coating shall provide paramount durability and wear resistance against foreign objects and normal wear and tear as well as sound deadening and insulation. The rubberized cab floor covering shall extend up the lower exterior sides of the engine enclosure to aid in sound deadening and heat resistance.

**TOOL MOUNTING PLATE**

There shall be a 3/16” smooth aluminum plate installed on the engine enclosure between the driver and the officer for use in mounting of equipment. The mounting plate shall feature beveled edges on the front and sides for a finished appearance. The plate shall be coated with the same finish as the engine enclosure and shall be secured to the engine cover with screws for easy replacement.

**TOP OF EXTENSION**

There shall be a flat work surface on top of the center console extension between the driver and officer.

**ENGINE HOOD LIGHTS**

An LED work light shall be installed in the engine enclosure with an individual switch located on the base of the light.

**COMPUTER TRAY**

There shall be a slide-out tray in front of the officer's seat for a laptop computer or other use. Under the slide out will be a stationary compartment approximately 13.5" wide x 3.75" high x 12" deep. The compartment shall have a hinged drop down door.

**INTERIOR SCUFF PLATE**

INSTALL A BRUSHED STAINLESS STEEL SCUFF PLATE ON BOTH INTERIOR B PILLARS. PLATES TO RUN FROM UPPER WEDGE SHAPE WIRE CHASE TO THE FLOOR LEVEL THAT IS BEHIND THE FRONT SEATS. PLATES TO PROTECT PAINT FROM SEAT BELTS.

**CENTER CONSOLE**

There will be located between the driver and officer a storage bin to have areas for EMS gloves, protable radios, misc. open areas, TIC charging base. This will be fabricated of alumium and sprayed in black scoprion.

**MICROPHONE BRACKET, MAGNETIC MIC, MM-SU-2012**

There will be (3) magnetic mic clips.
- Magnetic MIC
- Innovative Products, Inc
- SKU:MM-SU-2012
-(1) will be mounted on the upper left corner of Lower Console 4.
-Reference HS-6656-57 Columbus, OH.
-See Reference Photo #18 on shared drive.
-(2) will be shipped loose, mounted at Final Inspection.

CHASSIS WIRING

All chassis wiring shall have XL high temperature crosslink insulation. All wiring shall be color-coded, and the function and number stamped at 3" intervals on each wire. All wiring shall be covered with high temperature rated split loom for easy access to wires when trouble shooting. All electrical connectors and main connectors throughout the chassis shall be treated to prevent corrosion.

MASTER ELECTRICAL PANEL

The main chassis breaker panel shall be wired through the master disconnect solenoid and controlled by the three-position ignition rocker switch. The breaker panel shall be located in front of the officer on the interior firewall and shall be protected by a removable aluminum cover. The cover shall have an aluminum notebook holder on the exterior face accessible to the officer. The cover shall be painted with a durable finish to match the interior of the cab and shall be secured with two (2) thumb screws.

The breaker panel shall include up to 22 ground switched relays with circuit breaker protection. An integrated electrical sub-panel shall be provided and interfaced to the body and chassis through an engineered wire harness system.

Twelve (12) 20-ampere relays and one (1) 70-ampere relay shall be provided for cab light bar and other electrical items. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

Up to two (2) additional relay boards with circuit breaker protection shall be provided for additional loads as required. Each board shall contain four (4) relays. The relay boards shall be configured to trip with input from switch of positive-negative or load manager by moving the connector on the board (no tools required).

All relay boards shall be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).

Up to twenty-three (23) additional automatic reset circuit breakers for non-switched loads that are remotely switched (ie: heater fans, hood lights, etc.) shall be provided.

All relays and circuit breakers on the relay boards shall be pull-out/push-in replaceable.

All circuit breakers on the relay boards shall be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.

The system shall utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, shall be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices shall be ultrasonically welded connections and all internal wiring shall be high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches shall be ground controlled; no power going through any rocker switch.

Any switch controlling a relay in the breaker panel shall be capable of being set to function only when the parking brake is set. All relays shall be tagged with the function that the relay is controlling.

**INSTRUMENT PANEL**

The main dash shroud, which covers the area directly in front of the driver from the doorpost to the engine hood, shall be constructed of vacuum formed ABS material with scorpion texture. The dash shall be a one-

piece hinged panel that tilts outward for easy access to service the internal components. The gauge panel shall be constructed with a .125” aluminum panel, covered with a scratch resistant reverse printed and laminated poly carbonite.

The gauges shall be AMETEK Vehicular Instrumentation Systems (VIS), Next Generation Instrumentation System (NGI) with built-in self-diagnostics and red warning lights to alert the driver of any problems. All gauges and controls shall be backlit for night vision and identified for function. All main gauges and warning lights shall be visible to the driver through the steering wheel.

**MASTER BATTERY & IGNITION SWITCH**

The vehicle shall be equipped with a keyless ignition, with a three (3)-position Master Battery rocker switch, "Off/ACC/On" and a two (2)-position Engine Start rocker switch, "Off/Start".

**DIESEL PARTICULATE FILTER CONTROLS**

There shall be two (2) controls for the diesel particulate filter. One control shall be for regeneration and one control shall be to inhibit engine regeneration. These shall be located below the steering wheel in the kick panel.

**INSTRUMENTATION & CONTROLS**

Instrumentation on dash panel in front of the driver:
- Tachometer/hourmeter with high exhaust system regeneration temperature, and instrument malfunction indicators
- Speedometer/odometer with built in turn signal, high beam, and re-settable trip odometer
- Voltmeter
- Diesel fuel gauge
- DEF (Diesel Exhaust Fluid) gauge
- Engine oil pressure
- Transmission temperature
- Engine temperature
- Primary air pressure
- Secondary air pressure

Indicators and warning lights in front of the driver:
- Parking brake engaged
- Low air with buzzer
- Antilock brake warning

Check transmission
Transmission temperature
Upper power indicator
Seat belt
Engine temperature
Low oil indicator
Low voltage indicator
Air filter restriction light
Low coolant indicator
High idle indicator
Power on indicator
Check engine
Stop engine
Check engine MIL lamp
DPF indicator
High exhaust temperature
Wait to start

Other indicator and warning lights (if applicable):
Differential locked
PTO (s) engaged
Auto-slip response
Retarder engaged
Retarder temperature
ESC indicator
Jacks Out
Jacks Down

Controls located on main dash panel in front of the driver:
Master power disconnect with ignition switch
Engine start switch
Headlight switch
Windshield wiper/washer switch
Differential lock switch (if applicable)
Dimmer switch for backlighting

Controls included in steering column:
Horn button
Turn signal switch
Hi-beam low-beam switch
4-way flasher switch

Tilt-telescopic steering wheel controls

**CENTER CONTROL CONSOLE**

There shall be an ergonomically designed center control console. The console shall be constructed of 1/8" smooth aluminum and shall be mounted on the engine hood between the driver and officer. The console shall have a durable coating to match the color of the engine hood covering and shall feature surfaces on each side that are contoured to face the driver and the officer for easy viewing and accessibility. The switches and other customer specified electrical items shall be mounted in removable 1/8" smooth aluminum panels with a black wrinkle finish. The console shall have an aluminum lift-up lid with quick release latch. The lid shall be held in the open position with a gas strut to allow for easy access and serviceability.

Controls located in the console conveniently accessible to the driver:
Transmission shifter
Pump shift control with OK TO PUMP and PUMP ENGAGED lights
Remote mirror control
Illuminated rocker switches to control high idle, Jacob's brake, siren/horn, siren brake, master emergency, and other customer specified components
12V power point (if applicable)

Controls located in the console conveniently accessible to the driver and the officer (center):
Parking brake control with a guard to prevent accidental engagement

Controls located in the console conveniently accessible to the officer:
Illuminated rocker switches to control customer specified components that are easily reachable to the officer and do not allow for compromise of the driver's view, and eliminate the need for foot switches
Surface to recess siren head, radio head, or other desired items as space permits
12V power point (if applicable)

Driving compartment warning labels shall include:
HEIGHT OF VEHICLE
OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION
DO NOT USE AUXILIARY BRAKING SYSTEMS ON WET OR SLIPPERY ROADS
EXIT WARNINGS

Additional labels included:
COMPUTER CODE SWITCH
ABS CODE SWITCH
FLUID DATA TAG
CHASSIS DATA TAG

**OVERHEAD CONTROL CONSOLE**

An ergonomically designed overhead console shall be provided above the driver and officer, running the full width of the cab. The overhead console shall be constructed from 1/8" aluminum plate and shall be painted with a durable finish to match the inside of the cab. There shall be seven (7) removable 1/8" smooth aluminum plates with a black wrinkle finish to house switches and other electrical items.

Directly above the driver there shall be two (2) panels with no cutouts, unless otherwise specified by the customer.

There shall be a panel located to the right of the driver that shall be designated for defroster, heat, and air conditioning controls (if specified).

The center overhead panel shall be designated for up to seven (7) door ajar indicators. Upon releasing the apparatus parking brake, one or more of these lights shall automatically illuminate (flash) when any of the following conditions occur that may cause damage if the apparatus is moved: cab or compartment door is open; ladder or equipment rack is not stowed; stabilizer system deployed; any other device has not been properly stowed.

There shall be a panel to the left of the officer as well as two (2) directly above the officer. These panels shall have no cutouts, unless otherwise specified by the customer.

**ENGINE WARNING SYSTEM**

An engine warning system shall be provided to monitor engine conditions such as low oil pressure, high engine temperature and low coolant level. Warning indication shall include a STOP ENGINE (red) light with audible buzzer activation and a CHECK ENGINE (amber) light. Note: (Some engine configurations may also include a fluid warning light.)

There shall be a master information light bar with 24 lights located across the center of the dash panel that covers up to 24 functions. These are defined under Indicators and Warning Lights above.

**PUMP SHIFT MODULE**

A pump shift module with indicating lights shall be located within easy reach of the driver. A gear lockup shall be provided to hold the transmission in direct drive for pump operation.

**CAB LOCKDOWN INDICATOR LIGHT**

There shall be sensors in the cab lockdown latches. The sensors will send a signal to a marked light in the overhead light bar, inside the cab, to indicate when the cab in securely latched to the chassis, when the parking brake is released.

**DO NOT MOVE APPARATUS INDICATOR LIGHT**

A Whelen LINZ6 LED light shall be installed in the cab near the driver. The light shall illuminate when the parking brake is released and any cab or body door is open or any other item on the apparatus is not properly stowed that may cause damage.

**DOOR AJAR DISABLE SWITCH**

The purpose of this switch will be to shut off the lights wired to Door Ajar when the doors are open.
-Once the door has been closed and reopened the system will reset and the Door Ajar Lights will work again.
-This is for the M9 Scene Lights.
-Customer would like a Momentary Switch for this.
-Research and Advise TBD@Engineering.

**PROGRAMMABLE LOAD MANAGER**

Load manager shall have the ability to sequence loads on and off. The Super Node II has twenty-four (24) inputs and twenty-four (24) outputs. Eighteen (18) are positive polarity outputs and six (6) are ground polarity outputs. It shall also be able to establish a 8 priority levels to sheding loads when the vehicle is stationary, starting at 12.8 volts lowest priority load to be shed, then respectively at 12.7, 12.5, 12.3, 12.1, 11.9, 11.5 and never shed volts DC. An output is shed (turned OFF) when the system voltage drops below the designated priority level's shed voltage for thirty (30) seconds. If the voltage has dropped below multiple priority level shed voltages then each higher priority level will shed before the lower priority levels. An output is unshed (turned back ON) when the system voltage rises above the designated priority level's unshed voltage for ten (10) seconds. If the voltage has risen above multiple priority level unshed voltages then each lower priority level will unshed before the upper priority levels.
MASTER SWITCH
All outputs can be tied or not tied to the stage switch. In fire apparatus this switch is typically referred to as the master switch. The state of the stage switch is controlled by Utility Module output memory space 3. When this output is active the stage switch is active. Any output tied to the stage switch will be OFF if the stage switch is not active regardless of the output's multiplex equation. Set an output's to be tied to the stage switch by checking the stage switch box in its "Output Port Load Settings" under the "Settings" tab. The name of the stage switch can be changed from the standard "stage" to anything desired by modifying the text in the "Output Port Load Settings" area.

AUTOMATIC HIGH IDLE ACTIVATION

The Utility Module's high idle request (input memory space 2) is activated when the system voltage drops below the high idle threshold (12.8 volts standard or 25.6 volts if 24 volt load management is enabled) for 8 seconds or longer AND load management has been enabled (Utility Module output memory space 1 is active). The high idle request will remain active as long as the voltage remains below the voltage threshold and for 3 minutes after the system voltage rises above the voltage threshold. High idle can be canceled by activating the Utility Module's high idle cancel (output memory space 0).

**HIGH IDLE**

The engine shall have a "high idle" switch on the dash that shall maintain an engine RPM of 1,000. The switch shall be installed at the cab instrument panel for activation/deactivation. The "high idle" mode shall become operational only when the parking brake is on and the truck transmission is in neutral.

**CAB ACCESSORY FUSE PANEL**

A fuse panel shall be located underneath the rear facing seat on the officer's side. The fuse panel shall consist of six (6) battery hot and six (6) ignition switch circuits. Each circuit shall be capable of 10-ampere 12-volt power and total output of 50-amps. The fuse panel shall be capable of powering accessories such as hand held spotlights, radio chargers, hand lantern chargers and other miscellaneous 12-volt electrical components.

**POWER & GROUND STUDS, OVERHEAD COMMAND CONSOLE**

There shall be a set three (3) threaded power studs provided in the cab's overhead Command Console for future installation of two-way radios.

The studs shall be wired as follows:

- One (1) 12-volt 60-amp, direct to the battery
- One (1) 12-volt 30-amp controlled by the ignition switch
- One (1) 12-volt 125-amp ground

**POWER & GROUND STUDS, ELECTRICAL PANEL IN FRONT OF OFFICER**

There shall be a set three (3) threaded power studs provided in the cab's lower cab master electrical panel in front of the officer seat for future installation of two-way radios.

The

- One (1) 12-volt 40-amp, direct to the battery and #10 in sise
- One (1) 12-volt 40-amp controlled by the ignition switch  Shall be .375 Size
- One (1) 12-volt 125-amp groundstuds shall be wired as follows:

**VEHICLE DATA RECORDER**

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 shall be installed. Vehicle data shall be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.

Free software is available to allow the fire department to collect the data as needed.

**DUAL POWER POINT, USB-USBC**

A Kussmaul 12-volt dual port USB-USBC power point shall be provided in the cab.

**ALARM DISABLE**

There will be a switch in cab to disable back up alarm.

**MOMENTARY SWITCH FOR BACK-UP ALARM DISABLE**

There shall be a momentary switch to disable back up alarm if desired in lower position by driver.
Switched in Cab, Lower Console Position 2 “Alarm Disable”.

-

STORAGE SLOT W/0.5" LIP IN OVERHEAD
12 VOLT WIRE FOR HAAS
OEM’s to put an automotive grade 18 gauge wire yellow in color from the master emergency switch to the J1939/OBDII diagnostic connector port area. The wire should be capped off with heat shrink or tape so it doesn’t short out and should be clearly labeled with a tag (Master Emergency Signal).

**LIGHTING CAB INTERIOR**

Interior lighting shall be provided inside the front of the cab for passenger safety. Three (3) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. One light shall be located over each the officer and driver’s position. The lights shall also activate from the open door switch located in each cab doorjamb.

**LIGHTING CREW CAB INTERIOR**

Interior lighting shall be provided inside the crew cab for passenger safety. Three (3) Whelen 6" round ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided. The lights shall also activate from the open door switch located in each cab doorjamb.

**TECHNIQ D07 ACCENT LIGHTING LED (4)**

-Red LED/Black Flange. (D07-R00-1/D07-0BH0-1)
Referance HS 7757-58

**HEAVY DUTY HEATER/DEFROSTER/AIR CONDITIONER**

There shall be a minimum 80,000 cool BTU and 65,000 heat BTU single unit, heater/air conditioner mounted over the engine cover. The unit shall be mounted in center of the cab on the engine hood/enclosure. Unit shall have a shutoff valve at the right side of the frame, next to the engine. Airflow of the heater/air conditioner shall be a minimum 1200 CFM. To achieve maximum cooling, a TM-31 Compressor (19.1 cu. in.) will be used.

The defroster/heater shall be a minimum of 35,000 BTU and shall be a separate unit mounted over the windshield. There shall be eight (8) louvers/diffusers to direct to windshield and door glass. Airflow of the defroster/heater shall be a minimum 350 CFM. The unit shall be painted Zolatone greystone to match the cab ceiling.

The condenser shall be roof mounted and have 80,000 BTU rating. The unit shall include two fan motors. Airflow of the condenser shall be a minimum 2250 CFM. (This roof-mounted condenser shall work at full rated capacity at an idle with no engine heat problems.)

**HEATER/DEFROSTER/AIR CONDITIONING CONTROLS**

The heater/defroster/air conditioning shall be located in the overhead console in the center of the apparatus cab within reach of the driver and officer. The controls shall be illuminated for easy locating in dark conditions. The controls shall be located in such a way that the driver will not be forced to turn away from the road to make climate control adjustments. Control of all heater/defroster/air conditioning functions for the entire apparatus cab shall be achieved through these controls.

**FLOORBOARD HEATING DUCT**

There shall be ductwork to the floor of the cab, facing forward to provide heat for the front of cab floor area.

**DEFROSTER DIFFUSER**

A molded diffuser made of durable ABS plastic ductwork system shall be provided. It shall be form fitted and shall attach to the cab's overhead defroster unit to provide temperature controlled air to the windshields. Air flow of up to 280 cfm is balanced and directed across the entire windshield for optimum defrosting capability in all types of weather.

**TOOL MOUNTING PLATE**

There shall be a 3/16" smooth aluminum plate installed on top of the heat/ air conditioning unit for use in mounting of equipment. The plate shall measure approximately 25" wide x 19.5" long and shall be spaced up 1". The mounting plate shall feature beveled edges on the front and rear for a finished appearance. The plate shall be coated with the same finish as the heat/air conditioning unit and shall be secured with screws for easy replacement.

**STORAGE COMPARTMENT**

A storage unit constructed of .125" aluminum material shall be installed on the back of the heat/air conditioning, and shall have 4 small slots towards the outter ends with two on each side for portable radio storage. There shall also be a larger slot located in the center for miscellanous storage.

Metal deflectors shall be provided for the hood mounted heat/A/C unit.

**AUXILIARY DEFROSTER FAN**

There shall be a Red Dot model RD-5-5786-OP 12-volt fan mounted under the upper command console, outboard of console position 1, directed at the driver's side windshield. The fan shall be activated by a 3-position toggle switch located at the base of the fan. The switch positions shall be High, Low and Off.

**AUXILIARY DEFROSTER FAN**

There shall be a Red Dot model RD-5-5786-OP 12-volt fan mounted under the upper command console, outboard of console position 7, directed at the officer's side windshield. The fan shall be activated by a 3-position toggle switch located at the base of the fan. The switch positions shall be High, Low and Off.

**DIFFUSER FOR FRONT OF DEFROSTER/AC CHF-7344**

**DRIVER'S SEAT**

A H.O. Bostrom Sierra ABTS seat with air suspension shall be provided for the Driver. The seat back shall be fixed back and the seat cushion shall have a tapered, ergonomically contoured, extended seat cushion with bolster support and shall include occupancy sensor. The seat shall be equipped with a red 3-point shoulder harness with lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall have fore/aft adjustment and shall be upholstered with heavy duty Low Seam Durawear Plus material.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the left shoulder to the buckle on the right.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**OFFICER'S SEAT**

A H.O. Bostrom Tanker 550 ABTS SCBA fixed base seat shall be installed behind the Officer. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with a lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the right shoulder to the buckle on the left.

**UNDER SEAT STORAGE COMPARTMENT**

There shall be an open storage area under the officer's seat, accessible from the front. The storage area shall be approximately 19.5" wide x 14.375" high x 21.75" deep. The lower rear portion of the compartment shall be tapered to accommodate the wheel well and wiring chase. The opening shall be approximately 15.5" wide x 10.5" high.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**CREW SEAT – DRIVER'S SIDE, REAR FACING**

A H.O. Bostrom Tanker 550 ABTS SCBA fixed base seat shall be installed behind the Driver. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with a lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the right shoulder to the buckle on the left.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**CREW SEAT – OFFICER'S SIDE, REAR FACING**

A H.O. Bostrom Tanker 550 ABTS SCBA fixed base seat shall be installed behind the Officer. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with a lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the left shoulder to the buckle on the right.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**CREW SEAT - DRIVER'S SIDE, FORWARD FACING, INBOARD**

A H.O. Bostrom Tanker 550 ABTS SCBA fixed base seat shall be installed in the Driver's side forward-facing inboard position. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with a lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall be upholstered with heavy duty Durawear material, and stitched with a low seam all the way around the base cushion.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the left shoulder to the buckle on the right.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**CREW SEAT - OFFICER'S SIDE, FORWARD FACING, INBOARD**

A H.O. Bostrom Tanker 550 ABTS SCBA fixed base seat shall be installed in the Officer's side forward-facing inboard position. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with a lap belt and dual retractors built into the seat assembly with RiteHite™ Seat belt customized fit Adjustment. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

**SEAT BELT CONFIGURATION**

The seat belt shall be pulled from the right shoulder to the buckle on the left.

**HELMET STORAGE**

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

**SEAT UPHOLSTERY COLOR**

The cab seat upholstery shall be black in color.

**BOSTROM SEAT COVERS**

A removable Bostrom Zip Clean washable cover shall be provided on the bottom seat cushion and on the back rest of each seat.

An additional set of covers shall be also provided for each seat for use when the initial seat covers are removed for cleaning.

**CUSTOM SEAT LOGOS**

The seats shall include a custom logo in the headrest. The existing artwork shall be utilizied.

**SCBA BRACKETS**

Each SCBA seat in the cab shall feature an IMMI SmartDock hands-free self contained breathing apparatus (SCBA) storage bracket within the seat back.
The bracket shall consist of a main vertical support bracket, lower guide plate with valve retaining tabs, top claw assembly with wings, and an integral height adjustment knob. The top claw shall be adjustable for different diameters of SCBA cylinders. The head height shall be adjustable with the integrated adjustment knob for different heights of SCBA cylinders.
The bracket shall feature single-motion SCBA insertion and hands-free release when the fire fighter stands up to exit the seat. In the event of a collision, the top claws lock from inertial forces for a secure hold.

**SEAT BELT WARNING SYSTEM**

An Akron / Weldon seat belt warning system shall be provided, and shall monitor each seating position. Each seat shall be supplied with a sensor that, in conjunction with the display module located on the dash, shall determine when the seat belt was fastened and if the seat is occupied. An icon shall represent that the seat is properly occupied. An audible and visual alarm shall be activated if the seat is occupied and/or the belt is not fastened in the proper sequence.

**CREW SEAT COMPARTMENT**

A compartment shall be provided under the forward facing crew seats on the back wall of the cab. Two hinged doors in the center shall be provided on the front face of the compartment. They will be raised enough to clear the rubber stall matting.

**HD STEREO**

A Jensen HD AM/FM/WB Bluetooth stereo shall be provided with four speakers.

**REAR VISION CAMERA SYSTEM**

Provided and mounted on the apparatus shall be a Brigade camera system. The system shall consist of one (1) cab mounted #5611A HD 7" LCD monitor, one (1) model #5467 (Color) high definition resolution camera and one (1) camera cable. The monitor shall be dash mounted in plain view of the driver. The kit is capable of having two (2) additional cameras installed for a total of three (3). Comes with a 2 year system warranty.

**FIRE PUMP HALE QMAX-150**

Fire pump shall be midship mounted. The fire pump shall be of the double suction single stage centrifugal type, carefully designed in accordance with good modern practice.

The pump shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI.

The pump body shall be horizontally split, on a single plane, casing type with removable lower casing for easy removal of the entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in the chassis.

All moving parts in contact with water shall be of high quality bronze or stainless steel. Easily replaceable bronze labyrinth wear rings shall be provided. Discharge passage shall be designed to accomplish uniform pressure readings as the actual pump pressure. The rated capacity of the fire pump shall be 1500 gallons per minute in accordance with NFPA# 1901.

The pump shaft shall be rigidly supported by three bearings for a minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing shall be lubricated by a force fed, automatic lubrication system, pressure balanced to exclude foreign material. The remaining bearings shall be heavy duty type, deep groove ball bearings and shall be splash lubricated.

**PUMP TRANSFER CASE – G SERIES**

The drive unit shall be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. Pump drive unit shall be of sufficient size to withstand up to 16,000 lbs. ft. torque of the engine in both road and pump operating conditions.
The gearbox drive shafts shall be heat treated chrome nickel steel input and output shafts shall be at least 2-3/4" in diameter, on both the input and output shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.
The engagement of the pump transmission shall be of such design so as to permit transfer of power from road to pump operation only after vehicle is completely stopped. The pump shift shall be air actuated from the cab and have both a green "Pump Engaged" light, and a green "O.K.-To-Pump" light. A third green light shall be provided on the pump operator's panel for "Throttle Ready".
The pump drive unit shall be cast and completely manufactured and tested at the pump manufacturer's factory.

**MECHANICAL PUMP SEAL**

The pump seal shall be a maintenance free mechanical pump type seal.

**MANUAL PUMP SHIFT OVERRIDE**

A manual emergency override shift shall be provided on the pump panel and may be used by placing both the chassis transmission and the pump air shift control in "neutral" position.

**PUMP ANODE**

A Hale Anode Pro kit shall be provided and installed in the pump body. A minimum of three (3) anodes shall be installed, one each suction side and one in the discharge side.

**PUMP TEST & CERTIFICATION**

The pump shall be tested and certified by a third party independent testing agency, in accordance with NFPA 1901. A 3 hour pumping test from draft shall be conducted consisting of 2 hours of continuous pumping at 100% of rated capacity at 150PSI net pump pressure, followed by ½ hour of continuous pumping at 70% of rated capacity at 200PSI net pump pressure, and ½ hour of continuous pumping at 50% of rated capacity at 250PSI net pump pressure). The testing shall also include a pressure control system test, priming system test, vacuum test, a gauge/flowmeter test, and a pumping engine overload test. If the apparatus is equipped with a water tank, the water tank-to-pump test shall also be included.

**PUMP CONNECTIONS**

All suction and discharge lines (except pump manifolds) 1" and larger shall be heavy-duty stainless steel pipe. Where vibration or chassis flexing may damage or loosen piping or where a coupling is necessary for servicing, a flexible connection shall be furnished. All lines shall be drained by a master drain valve or a separate drain provided at the connection. All individual drain lines for discharges shall be extended with a 90 degree fitting in order to drain below the chassis frame. All water carrying gauge lines shall utilize nylon tubing.

**PRESSURE GOVERNOR / MONITORING DISPLAY**

Fire Research PumpBoss model PBA400-A00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, two (2) 600 psi pressure sensors, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 3/4" deep. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.
The following continuous displays shall be provided:
CHECK ENGINE and STOP ENGINE warning LEDs
Engine RPM; shown with four daylight bright LED digits more than 1/2" high
Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments
Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments
Transmission TEMPERATURE; shown on an LED bar graph display in 10 degree increments
BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments
PSI / RPM setting; shown on a dot matrix message display
PSI and RPM mode LEDs
THROTTLE READY LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator.
The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:
High Engine RPM
High Transmission Temperature
Low Battery Voltage (Engine Off)
Low Battery Voltage (Engine Running)
High Battery Voltage
Low Engine Oil Pressure
High Engine Coolant Temperature
The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A control knob that uses optical technology shall

adjust pressure or RPM settings. It shall be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center.
A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.
The pressure governor and monitoring display shall be programmed to interface with a specific engine.
INTAKE PRESSURE CONRTOL RELIEF, ELKHART, 40-20 (3)

**INTAKE VALVE**

A Hale Master Intake valve shall be installed on the above specified intake. It shall be electrically actuated from the pump panel and include a manual override hand wheel on the pump panel. The valve shall include a pressure relief valve to guard against incoming pressure surges.

**INTAKE RELIEF**

A relief valve shall be installed on the intake side of the pump. The surplus water shall be discharged away from the pump operator and terminate with Male NST hose thread.

**INLET ADAPTER**

One (1) Task Force Tips #AH3ST-NX 6” NST female x 5” Storz 30-degree adapter with #A01ST 5” Storz cap and chain shall be provided for the above inlet.

**2.5" LEFT SIDE INLET**

A 2.5" gated inlet valve shall be provided on the left side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer. The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

**VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10-year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator's panel. The handle shall have a full 90 degree movement.

**THREAD TERMINATION**

The above shall terminate with National Standard Threads.

**INLET ADAPTER**

One (1) Harrington #HSMR30-25NH 2.5" NST male x 3" Storz adapter with #HBC-30 3" Storz cap and chain shall be provided for the above inlet.

**6" PUMP INLET**

A 6" diameter suction port with 6" NST male threads shall be provided, on the right side of vehicle. The inlet shall extend through the side pump panels and come complete with removable strainer and long handle chrome-plated cap.

**INTAKE VALVE**

A Hale Master Intake valve shall be installed on the above specified intake. It shall be electrically actuated from the pump panel and include a manual override hand wheel on the pump panel. The valve shall include a pressure relief valve to guard against incoming pressure surges.

**INTAKE RELIEF**

A relief valve shall be installed on the intake side of the pump. The surplus water shall be discharged away from the pump operator and terminate with Male NST hose thread.

**INLET ADAPTER**

One (1) Task Force Tips #AH3ST-NX 6” NST female x 5” Storz 30-degree adapter with #A01ST 5” Storz cap and chain shall be provided for the above inlet.

**2.5" RIGHT SIDE INLET**

A 2.5" gated inlet valve shall be provided on the right side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer. The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

**VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10-year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by a swing type handle located at the operator’s panel. The handle shall have a full 90 degree movement.

**THREAD TERMINATION**

The above shall terminate with National Standard Threads.

**INLET ADAPTER**

One (1) Harrington #HSMR30-25NH 2.5” NST male x 3” Storz adapter with #HBC-30 3” Storz cap and chain shall be provided for the above inlet.

**DISCHARGE #1 - LEFT**

The discharge in position #1 on the left side of the apparatus shall include the following features.

A 2.5" discharge shall be provided on the left side of the apparatus.

**VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10-year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by an handwheel control with position indicator located at the operator’s panel.

**2.5" PRESSURE GAUGE**

An Innovative Controls TC Series glass-filled nylon case, a clear scratch-resistant lens, and a highly-polished stainless steel bezel pressure gauge shall be provided. The gauge shall be 2.5” in diameter with a white face, and black enhanced lettering. The gauge shall be fully-filled with a synthetic mixture to dampen shock and

vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F. The gauge shall also include a KEM-X Socket Saver diaphragm in the stem to eliminate freeze-up and contain a low temperature instrument oil that fills and protects the socket and bourdon tube. The gauge shall display a range from 0 to 400 psi with enhanced black markings on a white dial. IC Part Number 3101747-00-01.

**DISCHARGE TERMINATION**

The discharge valve shall be equipped with a 30° elbow termination that is capped and chained.

**THREAD TERMINATION**

The above shall terminate with National Standard Threads.

**DISCHARGE ADAPTER**

One (1) Harrington #HSFR30-25NH 2.5” NST female x 3” Storz adapter with #HBC-30 3” Storz cap and chain shall be provided for the above discharge.

**DISCHARGE #3 - RIGHT**

The discharge in position #3 on the right side of the apparatus shall include the following features.

A 2.5" discharge shall be provided on the right side of the apparatus.

**VALVE**

The valve shall be an Akron Heavy-Duty swing out 8000 series brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall a 10-year warranty covered by Akron Brass.

**VALVE ACTUATOR**

The valve shall be controlled by an handwheel control with position indicator located at the operator's panel.

**2.5" PRESSURE GAUGE**

An Innovative Controls TC Series glass-filled nylon case, a clear scratch-resistant lens, and a highly-polished stainless steel bezel pressure gauge shall be provided. The gauge shall be 2.5" in diameter with a white face, and black enhanced lettering. The gauge shall be fully-filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F. The gauge shall also include a KEM-X Socket Saver diaphragm in the stem to eliminate freeze-up and contain a low temperature instrument oil that fills and protects the socket and bourdon tube. The gauge shall display a range from 0 to 400 psi with enhanced black markings on a white dial. IC Part Number 3101747-00-01.

**DISCHARGE TERMINATION**

The discharge valve shall be equipped with a 30° elbow termination that is capped and chained.

**THREAD TERMINATION**

The above shall terminate with National Standard Threads.

**DISCHARGE ADAPTER**

One (1) Harrington #HSFR30-25NH 2.5" NST female x 3" Storz adapter with #HBC-30 3" Storz cap and chain shall be provided for the above discharge.

**MASTER PUMP DRAIN**

A multiport master drain valve shall be provided and plumbed to multiple locations on the main pump body. The valve assembly shall be clearly marked as the Master Drain.

**DRAIN VALVES LIFT UP STYLE**

Vertical lift up style, quarter turn style drain valves shall be provided for each suction inlet, or discharge outlet as specified. Each drain shall be clearly marked and color coded to match the corresponding suction of discharge.

**WATERWAY VALVE AND ACTUATOR**

The waterway valve shall be an Akron 4" electric valve. The valve shall be controlled by an Akron Navigator 9335 electric actuator located at the operator's panel. The actuator shall be connected to both a flow sensor and a pressure sensor. The actuator shall display pressure, flow, and valve position on a full color LDC display.

**WATERWAY DRAIN VALVE**

An Akron 1.5" waterway drain valve shall be provided and controlled with a push/pull handle.

WATERWAY OVERRIDE, HAND WHEEL

**PUMP AND GAUGE PANELS**

Pump panels on both sides shall be easily removable. The gauge and control panels shall be two separate panels for ease of maintenance. There shall be one (1) removable access door as large as possible on the right side pump panel. This door shall have 1/4 turn latching mechanisms for easy removal.

The pump controls and gauges shall be located at the left side of the apparatus and properly marked. The control panel shall be laid out in a user-friendly manner.

All valve controls shall have the corresponding discharge gauge located immediately adjacent to control handle to allow operator to view the discharge pressure without searching the panel.

**PANEL FINISH**

The panels shall be constructed of brushed stainless steel for maximum protection against abrasion caused during normal use

**ESCUTCHEON PLATES**

The pump panel shall be equipped with color-coded removable escutcheon plates around the suction and discharge valves.

**COLOR CODING**

Each discharge valve control, outlet, and corresponding line gauge shall be color-coded. The color-coding shall be (as applicable):

#1 Discharge - Yellow
#2 Discharge – Blue
Waterway Purple

**PUMP MODULE FRAMEWORK**

The pump module framework shall not be painted.

**PLUMBING FINISH**

The plumbing shall be natural finish.

**PUMP PANEL LIGHTING, LED**

The driver's side pump panel controls and gauges shall be illuminated by a full width white TecNiq E44 LED light strip, controlled at the pump panel.

**PUMP PANEL LIGHTING, LED**

The officer's side pump panel shall be illuminated by a full width white TecNiq E44 LED light strip, controlled at the pump panel.

**PUMP PANEL GAUGES AND CONTROLS**

The following gauges and controls shall be provided at the pump panel:

- Two (2) certified laboratory test gauge outlets.
- Pump primer control.
- Master drain control and additional drains as needed.
- Pump capacity rating plate.
- All discharge controls.
- Two (2) master pump gauges.
- Gauges on all 1-1/2" and larger discharge lines.

**PRIMING SYSTEM**

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multi-stage, venturi based AirPrime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump. The priming system shall have a five year warranty.

**(1) PRIMER BUTTON - MAIN SUCTION**

A single panel mounted control will activate the priming pump and open the priming valve to the pump.

**COMPRESSION FITTINGS ON AIR SYSTEM**

Compression style fittings shall be provided on air lines within the pump module.

**AIR OUTLET**

One (1) air chuck shall be provided adjacent to the pump operator's panel on the driver's side. The system shall tie into the accessory tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

**THERMAL RELIEF VALVE**

There shall be a Hale TRV-L Thermal Relief Valve supplied. The valve shall automatically dump a controlled amount of water to atmosphere when the pump water exceeds 120 degrees Fahrenheit. The valve shall re-set automatically. A light shall be provided at the pump panel, which will illuminate when the pump reaches 120 degrees Fahrenheit to warn the operator that the pump is automatically dumping.

**GAUGE HEATER**

An Innovative Controls gauge heater with four (4) heat tapes shall be provided.

An additional heat tape shall be provided.

**AIR HORN BUTTON**

A push button switch shall be provided on pump operators panel to activate the air horns.

**4" MASTER GAUGES**

An Innovative Controls TC Series glass-filled nylon case, a clear scratch-resistant lens, and a highly-polished stainless steel bezel pump pressure and vacuum gauges shall be provided. The gauges shall be 4" in diameter with a white face, and black enhanced lettering. The gauges shall be fully-filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F. The gauges shall also include a KEM-X Socket Saver diaphragm in the stem to eliminate freeze-up and contain a low temperature instrument oil that fills and protects the socket and bourdon tube. The gauges shall display a range from -30 to 400 psi with enhanced black markings on a white dial.

**APPARATUS BODY**

All side metal, compartments and compartment floors shall be of bolted stainless steel. The body shall be assembled with heavy-duty stainless steel channel sills with bracing for extreme rigidity and mounted on a steel subframe.

The compartment body, pump housing and the engine compartment shall be separate modules (segmented body design) that are not to be fastened together in any manner in order to provide "flex joints" to alleviate stress and cracking of body compartments and running boards.

Compartments shall extend from the front jacks to the tailgate of the apparatus and shall be recessed to the frame of the apparatus where possible.

Compartments shall have sweep-out flooring (no obstruction at the floor bottom).

Each compartment shall be properly vented with louvers.

**REAR COMPARTMENT BELOW HOSE BED**

There shall be a compartment below the hose, between the frame rails, approximately 26" wide x 9-7/8" high x 88" deep.

**COMPARTMENTATION LEFT SIDE**

There shall be a compartment below the turntable as follows:
L1- Approximately 20-1/4" wide x 38-1/2" high x 20-1/4" deep.

There shall be two compartments above the rear wheels:
L2- Approximately 58" wide x 27-1/2" high x 26" deep. This compartment shall have a pan type lift up door equipped with “D” ring latch and gas door stay.
L3- Approximately 58" wide x 27-1/2" high x 26 deep. This compartment shall have a pan type lift up door equipped with “D” ring latch and gas door stay.

There shall be three compartments behind the rear wheels:
L4- Approximately 45-3/4" wide x 56-1/2" high x 26-1/2" deep.
L5- Approximately 22" wide x 56 1/2" high x 26-1/2" deep.
L6- Approximately 34 3/4" wide x 40-1/8" high x 26-1/2" deep.

**COMPARTMENTATION RIGHT SIDE**

There shall be a compartment below the turntable as follows:
R1- Approximately 40-1/4" wide x 38-5/8" high x 27-1/2". The lower portion shall be 10" deep. There shall be a 14" high x 17-1/2" deep x 40-1/4" wide notch in the lower rear portion of the compartment to accommodate the apparatus exhaust system.

There shall be two compartments above the rear wheels:
R2- Approximately 41-5/8" wide x 27-1/2" high x 26-1/2" deep. This compartment shall have a pan type lift up door equipped with “D” ring latch and gas door stay.
R3- Approximately 58" wide x 27-1/2" high x 26-1/2" deep. This compartment shall have a pan type lift up door equipped with “D” ring latch and gas door stay.

There shall be three compartments behind the rear wheels:
R4- Approximately 45-3/4" wide x 56-1/2" high x 26-1/2" deep.

R5- Approximately 45-3/4" wide x 56-1/2" high x 26-1/2" deep.
R6- Approximately 34-3/4" wide x 40-1/8" high x 26-1/2" deep.

**AERIAL BODY SUB-FRAME**

The chassis shall be fitted with a sub-frame system consisting of a series of stainless steel plate gusseted legs, extending down and out from the chassis frame rails on each side. This system will provide additional structural support to the running boards and side compartments. A heavy-duty rear platform shall be constructed of mild steel to support the rear compartments. The entire assembly will be attached to the chassis frame by a series of heavy-duty U-bolts. Self-supporting bodies will not be acceptable. NO EXCEPTIONS.

**COMPARTMENT INTERIOR - L1**

The L1 compartment on the left side of the apparatus shall include the following features:

No compartment options were selected for L1.

**COMPARTMENT INTERIOR - L2**

The L2 compartment on the left side of the apparatus shall include the following features:
No compartment options were selected for L2

**COMPARTMENT INTERIOR - L3**

The L3 compartment on the left side of the apparatus shall include the following features:

**ADJUSTABLE SHELF**

There shall be an adjustable shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate. This shelf will be a half shelf located in the rear of compartment mounted to the mounting plate and be adjustble.

**ALUMINUM TOOL MOUNTING PLATE**

A 3/16" aluminum plate shall be provided in the compartment for mounting tools.

**COMPARTMENT INTERIOR - L4**

The L4 compartment on the left side of the apparatus shall include the following features:

**ADJUSTABLE SHELVES**

There shall be three (3) adjustable shelves provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.
(1) shelf to be fixed for the cord reel mounting. (2) shelves to be installed to the right of the divider. Bottom shelf to be 12" from the floor. 2nd shelf to be 12" from bottom shelf. These two shelves are to have 1" lips at the front. Divider to be installed so there is 13" of clear opening between the right side door opening and the dividerd the divider.

**COMPARTMENT DIVIDER**

There shall be a vertical divider/partition provided in a compartment as specified. The divider shall be constructed of .188" thick smooth aluminum plate. The top and bottom of the divider shall have a formed flange bolted to the interior of the compartment.

**COMPARTMENT INTERIOR - L5**

The L5 compartment on the left side of the apparatus shall include the following features:

**ADJUSTABLE SHELF**

There shall be an adjustable shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.

**COMPARTMENT INTERIOR - L6**

The L6 compartment on the left side of the apparatus shall include the following features:

**ADJUSTABLE SHELF**

There shall be an adjustable shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.

**COMPARTMENT INTERIOR - R1**

The R1 compartment on the right side of the apparatus shall include the following features:

**ADJUSTABLE SHELF**

There shall be an adjustable shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.

**600# SLIDE-MASTER TRAY**

There shall be a Slide-Master pullout drawer provided and installed. The drawer shall have a distributed load capacity of 600 lbs. and be capable of extending 100% of its depth. The tray shall be fabricated of .188" aluminum plate and have a formed lip that measures 2".

**COMPARTMENT INTERIOR - R2**

The R2 compartment on the right side of the apparatus shall include the following features:
**ADJUSTABLE SHELF**

There shall be an adjustable shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate. There will be a half shelf located on the rear compartment wall on the mounting plate and will be adjustble.

**ALUMINUM TOOL MOUNTING PLATE**

A 3/16" aluminum plate shall be provided in the compartment for mounting tools.

**COMPARTMENT INTERIOR - R3**

The R3 compartment on the right side of the apparatus shall include the following features:
**ALUMINUM TOOL MOUNTING PLATE**

A 3/16" aluminum plate shall be provided in the compartment for mounting tools.

**COMPARTMENT INTERIOR - R4**

The R4 compartment on the right side of the apparatus shall include the following features:
**ADJUSTABLE SHELVES**

There shall be three (3) adjustable shelves provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.

Divider to be installed so there is 13" of clear opening between the right side door opening and the divider. (1) shelf to be fixed for the cord reel mounting. (2) shelves to be installed to the right of the divider. Bottom shelf to be 12" from the floor. 2nd shelf to be 12" from bottom shelf. These two shelves are to have 1" lips at the front.

**COMPARTMENT DIVIDER**

There shall be a vertical divider/partition provided in a compartment as specified. The divider shall be constructed of .188" thick smooth aluminum plate. The top and bottom of the divider shall have a formed flange bolted to the interior of the compartment.

**COMPARTMENT INTERIOR - R5**

The R5 compartment on the right side of the apparatus shall include the following features:

**ADJUSTABLE SHELF**

There shall be an adjustable half shelf provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.

**ADJUSTABLE ROLLOUT DRAWER**

There shall be a 250 lb. capacity rollout drawer supplied and installed in a compartment. The drawer shall be approximately 3" deep and shall be mounted on adjustable tracks.

**600# SLIDE-MASTER TRAY**

There shall be a Slide-Master pullout drawer provided and installed. The drawer shall have a distributed load capacity of 600 lbs. and be capable of extending 100% of its depth. The tray shall be fabricated of .188" aluminum plate and have a formed lip that measures 2".
-(1) Adjustable shelf, half depth, full width, high.
-(2) 250” Adjustable Drawer, full depth and width, mid-way up, on grant slides. -(1) 250# Fixed Drawer on floor, full depth and width, on slide-master base. -Reference HS-6054 Columbus, OH.

**COMPARTMENT INTERIOR - R6**

The R6 compartment on the right side of the apparatus shall include the following features:

**ADJUSTABLE SHELVES**

There shall be one (1)  adjustable shelves provided and installed in the compartment. The shelf shall be fabricated of .188" aluminum plate.  There will be one (1) half shelf located on the rear unistrut in the upper portion of the compartment for the electric chainsaw.  There will be a full depth  and width shelf adjustble in the lower half of the compartment.

**COMPARTMENT INTERIOR - A1**

The A1 compartment on the rear of the apparatus shall include the following features:  There will be a cover that will block the vent for this compartment installed and sealed.

**SLIDE-OUT TRAY**

There shall be a slide-out tray provided and installed in the rear compartment. The tray shall have a distributed load capacity of 500 lbs. utilizing UHMW slides and shall be capable of extending 75% of its depth. The tray shall be fabricated of .188" aluminum plate and measure approximately 85" deep x 24" wide with 8.75" sides and a 2.75" front lip.

**VENT COVER**

The A1 compartment will not have a vent.

**UNISTRUT**

Each compartment shall come equipped with 1.625" x .875" x .125" aluminum Unistrut channel. The Unistrut shall be securely fastened to the interior walls of the compartment.

**ROLL-UP COMPARTMENT DOORS**

Compartment doors shall be equipped with AMDOR™ brand roll-up doors in a satin finish, complete with the following features:

- 1” aluminum double wall slats with continuous ball & socket hinge joint designed to prevent water ingression and weather tight recessed dual durometer seals
- double wall reinforced bottom panel with stainless steel lift bar latching system
- bottom panel flange with cut-outs for ease of access with gloved hands
- reusable slat shoes with positive snap-lock securement
- smooth interior door curtain to prevent equipment hang-ups
- one-piece aluminum door track / side frame
- top gutter with non-marring seal
- non-marring recessed side seals with UV stabilizers to prevent warpage

- dual leg bottom seal, with all wear component material to be Type 6 Nylon

**DOOR LOCKS**

The compartment doors shall be equipped with locks. The locks shall all be keyed alike.

**COMPARTMENT LIGHTING**

Each compartment shall be equipped with two (2) white AMDOR LED light strips which shall provide a consistent pattern to illuminate to entire compartment.

HATCH COMPARTMENT
There will be a hatch compartment style door to access the top of L4 compartment rear portion.

**HOSE BED COVER**

There shall be a nylon/vinyl hose bed cover for the main hose bed. The cover shall be capable of being securely fastened at the front, sides and rear.

**SIDE HOSEBED LIGHTING**

TecNiq E44 LED light strips shall be provided on the interior hosebed walls, one each side.

**BODY HANDRAILS**

Handrails shall be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges. The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails, shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange. Sufficient space shall allow for a gloved hand to firmly grip the rail.

The rails shall be located in the following areas:
(Note: These are in addition to those previously mentioned in the cab section):

There shall be one (1) handrail at the side of the pedestal.

There shall be one (1) handrail located at the entrance to the aerial platform

There shall be two (2) handrails at the rear access ladder to the platform.

**STEPS**

There shall be up to four (4) Innovative Control fold-down steps with integrated step lights mounted on each side of the front face of body to provide access to the top of the pump module and compartments.

The quantity and location of steps and handrails shall meet the Current NFPA 1901 pamphlet in effect at the time the apparatus is ordered.

**RUB RAILS**

The body shall be equipped with anodized aluminum channel style rub rails at the sides. Rub rails shall be spaced away from the body by 1/2" polymer spacers. The rub rails shall be polished to a bright finish. There shall be Red/White DOT striping in rub rail.

**ALUMINUM TREADPLATE**

All load bearing aluminum treadplate running boards shall be .155 thick bright annealed with a serrated embossed finish. Running boards and rear step edges shall be flanged down for added strength. Running boards shall also be flanged up to form kick plates. All non-load bearing aluminum shall be .125" thick bright annealed finish. In areas where aluminum treadplate shall function as a load-bearing surface, there shall be a heavy steel sub-structure. This structure shall consist of 3" channel and 1-1/2" angle welded support. This shall assure that there shall be no flexing or cracking of running boards. The aluminum shall be insulated from the steel by closed cell foam body barrier material.

Treadplate locations:
1. Skirting around front bumper.
2. The step at the cab entrance.
3. The jump seat steps.
4. The running boards.
6. The top of the compartments.
7. The top of the turntable.
8. The floor of the platform.

**WHEEL LINERS**

Fiberglass fully radiused wheel well liners with adequate support to maintain their rigidity through adverse weather conditions shall be provided.

## SCBA CYLINDER COMPARTMENTS

There shall be six (6) spare breathing air cylinder compartments recessed in the rear fender wells, three (3) left and three (3) right. The interior compartment shall be constructed of a high-density polyethylene plastic.

## DOOR FINISH

The single or double SCBA compartments shall have a brushed stainless door equipped with a weather resistant flush fitting thumb latch. The interior of the door shall incorporate a rubber seal to keep the compartment free of road debris and moisture.

## PIKE POLE COMPARTMENT

Located ahead of the body compartments above the pump will be a full through compartment. 1One (1) treadplate transverse compartment to be provided and installed on top of pump module ahead of body. Each end to have treadplate door with latch.

## FENDER PANELS

The rear side fenders shall be removable smooth stainless panels, painted truck color.

## GROUND LADDERS

The apparatus shall be equipped with 209' of Duo-Safety ground ladders. The ladders shall meet the requirements of NFPA 1931 to ensure proper design and that sufficient strength is available for the service intended. The ground ladders shall be constructed of aluminum.

One (1) 10 ft. folding ladder (mounted in fly section)
One (1) 16 ft. roof ladder (mounted on driver's side of aerial base section)

Ladders mounted inside the body:
One (1) 10 ft. folding ladder
One (1) 12' 2-section attic ladder
One (1) 14' roof ladder
One (1) 16' roof ladder
One (1) 20' 2-section extension ladder
Two (2) 24 ft. 2-section extension ladders

One (1) 28' 2-section extension ladder
One (1) 35 ft. 2-section extension ladder
The ladders shall have lifetime Warranty against manufacturing defects.

**LADDER**

One (1) 17-foot Little Giant ladder shall be provided.

One of the roof ladders shall be mounted on the side of the base section of the aerial.

**LADDER ENCLOSURE**

The ground ladders shall be stored within a weather resistant enclosed area on the officer's side of the hosebed area. The ladders shall be mounted on non-metallic slides so each ladder can be removed individually. All ladders shall be stored on beam if possible. A vertically hinged treadplate door shall enclose the ladders on the rear.

**LADDER CHUTE DOOR**

A smooth aluminum door shall enclose the ladders at the rear.

**LADDER CHUTE DOOR STOPS**

The following Cast Products stay-open mechanism at bottom of each ladder chute door will be installed to hold the door open when in use.

**LADDER CHUTE**

Ensure that ladder chute slides are installed so the ladder can be stored on either beam (symmetrical bases) and the center portion comfortably fits the folding ladder. Design to be the same as 6354 . Rear ladder chute doors to be smooth aluminum with chevron striping.  Officer's side door to open first.

**ADDITIONAL LADDER MOUNTING**

A 17' Little Giant ladder to be installed on top of officer's side compartments between R4 and L4 (treadplate pocket at front w/PAC strap).

A customer supplied Ladder Install above right side body compartments. Use treadplate pocket at one end w/PAC strap at other end. See photos of installation on previous units. The ladder is located above the R2 compartment. Customer supplied ladder is a Louisville Ladder Model #AS1006

**ADDITIONAL LADDER & MOUNTING**

Forest Grove, Correoplois PA Refereance above the L6 & Ladder Chute below the bucket and is accessible from the driver side top of the compartment.
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**BODY ELECTRIC SYSTEM**

All body electrical wiring in the chassis will be XLP cross link-insulated type. Wiring is to be color-coded and include function codes every three (3) inches. Wiring harnesses will be routed in protective, heat resistant loom, securely and neatly installed. Two power distribution centers will be provided in central locations for greater accessibility. The power distribution centers contain automatic thermal self-resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays are utilized in circuits which amp loads are substantially lower than the respective component rating thus ensuring long component life. Power distribution centers will be composed of a system of interlocking plastic modules for ease in custom construction. The power distribution centers are function oriented. The first is to control major truck function and the second controls overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers also have accessory breakers and relays for future installations. All harnesses and power distribution centers will be electrically tested prior to installation to ensure the highest system reliability.

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

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

All harnesses shall be covered with moisture resistant loom with a minimum rating of 300 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable has a minimum rating of 289 degree Fahrenheit.

All harnesses are securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations use a method that provides a positive mechanical and electrical

connection and are in accordance to the device manufacturer's instructions. No connections within the harness utilize wire nut, insulation displacement, or insulation piercing.

All circuits conform to SAE1292. All circuits are provided with low voltage over current protective devices. These devices are readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers are not used for ground connections.

**BACK-UP ALARM**

An Ecco model SA917 automatic self-adjusting electronic back-up alarm producing 87-112 db shall be installed at the rear between the frame rails. It shall operate whenever the transmission's reverse gear is selected.

**STOP/TAIL/TURN/REVERSE LIGHTS**

The rear stop/tail/turn/reverse lights shall be Whelen M6 series lights installed in quad housings one (1) each side on the rear of the apparatus body. The stop/tail lights shall be LED model M6BTT located in the top position of the housing. The amber arrow turn signals shall be LED model M6T located below the stop/tail lights. The reverse lights shall be LED model M6BUW located below the turn signals. The bottom position of the housing shall accommodate a Whelen M6 series warning light.

**LED ICC/MARKER LIGHTS**

LED type ICC/marker lights shall be provided to meet D.O.T. requirements.

**FLEXIBLE MARKER LIGHTS**

A Britax L427.200.L12V LED flexible marker light shall be mounted on the rear lower corners of the body, one each side.

**GROUND LIGHTING**

The apparatus shall be equipped with lighting capable of illumination to meet NFPA requirements. Lighting shall be provided at areas under the driver and crew riding area exits and shall be automatically activated when the exit doors are opened. The ground lights shall be TecNiq T44 LED. Lighting required in other areas such as work areas, steps and walkways shall be activated when the parking brake is applied, provided the ICC lights are on.

**GROUND LIGHTS INDEPENDENT SWITCH**

A switch shall be provided in the cab to activate/deactivate the undercarriage lighting.

Zone A (front) shall have three (3) Whelen Freedom IV 21" LED light bars. The center light bar shall have two (2) red corner LED modules, one (1) forward-facing red LED module, and one (1) white forward-facing LED module. Each outer light bar shall have one (1) end red LED module, two (2) corner red LED modules, one (1) forward-facing red LED module and one (1) forward-facing white LED module. The light bars shall have all clear outer lenses. The light bars shall be installed on the cab roof as far forward as possible each with two (2) MK8H 5" cast aluminum risers. The two (2) outer light bars shall be installed at a 45-degree angle to the center light bar.

Zone B (officer's side) shall be covered by the module from the light bar and the rear beacon.

Zone C (rear) shall have two (2) Whelen Model MCFLED2* Micro Freedom LED beacons installed one (1) each side on the upper rear of the apparatus. Each beacon shall feature two (2) rear-facing corner LED modules.

Zone C (rear) shall have one (1) Whelen M6 Series model M6* Super LED warning light installed on the rear face of the aerial platform.

Zone D (driver's side) shall be covered by the module from the light bar and the rear beacon.

Zone A (front) shall have four (4) Whelen M6 series model M6* Super LED warning lights.

The lights shall be installed two (2) each side on the front of the cab in the warning light housings.

Zone B (officer's side) shall have four (4) Whelen M6 series model M6* Super LED warning lights.

The lights shall be installed one (1) near the front corner of the apparatus, one (1) under the turntable area, one (1) near the rear axle, and one (1) near the rear corner of the apparatus.

Zone C (rear) shall have two (2) Whelen 600 series model 60*02F*R Super LED warning lights installed one (1) each side on the lower rear of the apparatus.

Zone D (driver's side) shall have four (4) Whelen M6 series model M6* Super LED warning lights.

The lights shall be installed one (1) near the front corner of the apparatus, one (1) under the turntable area, one (1) near the rear axle, and one (1) near the rear corner of the apparatus.

**ADDITIONAL WARNING LIGHTS**

There shall be (4) additional pairs of Whelen M6 Series model M6* Super LED warning lights installed on the apparatus.
-(1) Each side of the cab grill -(1) Each side of Cab above front Axle. -(1) Each side of Cab above Exterior Cab Compartment. -(1) Each side of Body under L2/R2.

**ADDITIONAL WARNING LIGHTS**

There shall be (6) additional pairs Whelen ION T-Series TLI* LED warning lights installed on the apparatus.
Rub Rail location in same color and locations as previous C Bus units HS 6655

**SCENE LIGHTS**

Three (3) pairs of Whelen M9 LED scenelights shall be installed.
Light Mounting Location & Switching = (1) each side of cab extensions in upper rear corners (1) on each outrigger above warning light (1) each side on rear of body up high Both left side lights to be wired to (1) 3-way switch above driver and (1) 3-way switch on officer's side of lower command console. Both right side lights to be wired to (1) 3-way switch above driver and (1) 3-way switch on officer's side of lower command console. Lights on cab and outrigger panel also to be wired to come on with respective left/right cab door open. Both rear lights to be wired to (1) switch on cab dash and also with reverse.

**SCENE LIGHT**

Three (3) FireTech Mini-Brow FT-MB-2.18-FT-* scene light shall be provided. The fixture shall have two (2) rows of 18 LEDs (36 LEDs total). The overall length should be 21". The fixture shall operate from 9-32v DC, shall draw 15 amps @ 12v DC, and shall produce 19,008 equivalent lumens. The fixture will have a combination of spot and flood optics and shall be wired to a switch above the driver. The light shall be mounted using an adjustable captive rail with detachable mounting feet. The device manufacturer shall warrant the fixture against defects in materials or workmanship for the life of the apparatus.
These lights will be mounted under the light bars that are 45 Degree Light bars on each side of the cab and the center.
These will be white housings.
-Switched in cab overhead console 1, Brow Light
-Switched in cab, Overhead console position 5, "Brow Light".
The brow lights can activate anytime.

**SCENE LIGHT**

Four (4) FireTech Mini-Brow FT-MB-2.27-FT-* scene light shall be provided. The fixture shall have two (2) rows of 27 LEDs (54 LEDs total). The overall length should be 30". The fixture shall operate from 9-32v DC, shall draw 22.5 amps @ 12v DC, and shall produce 38,016 equivalent lumens. The fixture will have a combination of spot and flood optics and shall be wired to a switch above the driver. The light shall be mounted using an adjustable captive rail with detachable mounting feet. The device manufacturer shall warrant the fixture against defects in materials or workmanship for the life of the apparatus.
There will be one located on each side of the cab center over the fixed window

There will be one located on each side of the body above the L4 and R4.
There will be a treadplate guard over each to protect.

**ADDITIONAL 3-WAY SWITCH**

An additional 3-way switch shall be provided per the customer's location.

**SCENE LIGHT BOX**

Install (4) aluminum tread plate boxes, one for each of the Spectra scene lights (one each side on top of cab roof and one each side above L4/R4). Boxes previously used on Quartz similar shall be used for mounting of Spectras.

**GENERATOR**

The apparatus shall be equipped with a complete electrical power generation system.
A Harrison hydraulic 15.0 KW generator model MPC – 16/3 shall be provided and installed. The generator and wiring shall conform to present National Electric Codes as outlined in the National Fire Protection Association Standards.
The output of the generator shall be controlled by an internal hydraulic system. An electrical instrument gauge panel shall be provided for the operator to monitor and control all electrical operations and output.
The generator shall be powered by a transmission power take off unit, through a hydraulic pump and motor.
The generator shall be operable anytime that the apparatus engine is running and meeting the minimum range of 900 RPM's.
Height 23"
Width 29"
Depth 19"
Weight 431
Max kW 15.0
AMPS@120V 125
AMPS@240V 63
HP Required 126
Torque Required 131.9
Maximum Pressure 3600 psi

**BREAKER BOX**

A circuit breaker box shall be provided with twelve (12) spaces for breakers which shall be provided as needed. All wiring shall be installed in liquid tight conduit.

**BREAKER PANEL**

The breaker panel shall be located in the L2 Compartment and shall meet all requirements set forth by the National Electrical Code and NFPA guidelines.

**120-VOLT OUTLET**

A 120-volt outlet with weatherproof cover shall be provided. All 120 volt wiring shall be installed in liquid tight conduit.

**AUTOMATIC TRANSFER SWITCH**

A Progressive Dynamics PD5100 30 amp automatic transfer switch shall be installed to automatically switch on board loads from shoreline power to generator power.
Transfer Switch Outlets = Install in L2 to right of 2nd breaker panel. Install from ceiling of compartment if needed for space. Transfer switch to provide power to the Iota battery charger and both shoreline outlets (behind the driver's seat/L3 compt.) when generator is on.

**SECONDARY PORTABLE GENERATOR TRANSFER SWITCH**

There will be installed an electrical inlet in the R1 compartment for use with a customer supplied Honda 5000w portable generator. The inlet shall be wired to provide power to the 120V/240V electrical system if the Stadco diesel generator becomes inoperable. The inlet power shall be controlled with R1 compartment (upper right corner on back wall). Electrical Engineering team to determine exact components needed. NEMA # to be L14-30 30amp twist lock.

**CORD REEL**

There shall be a Hannay Model ECR1616-17-18/4 electric rewind, four (4)-conductor cable reel furnished and mounted in a compartment. The reel shall come complete with 150 feet of 10/4 Seoprene Water-resistant (SOW) yellow jacketed cable. A Hannay Type "C" roller assembly and HS-3 cable stop ball shall be provided.

**REEL MOUNTING**

The reel shall be mounted in the a body compartment.  The specific mounting location shall be determined at the preconstruction conference.

**FOUR WAY RECEPTACLE**

Two (2)  Akron (GFE) EJBX-22P03030303G four-way receptacle box with light shall be provided and hard wired to the end of the cable. The box shall be securely mounted in the immediate area of the cord reel.
(4) Main NEMA Numbers Receptacles= All (4) to be L5-20. Box to have pigtail with L14-30. Split wiring inside box into (2) 120V circuits.

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## PORTABLE HANNAY REEL

There will be one (1) HANNAY CR16-14-16 PORTABLE W/200' of 14/3 installed on top of body on officer side above R1.

## ELECTRIC CORD REEL

Two (2) HANNAY ECR1622-17-18 W/200' OF 10/4 will be installed in L4 and (1) in R4 (on shelf). Rewind buttons to be installed on left side front unistrut.  Rollers to be installed as high as possible.  Reels to be wired 240V w/20amp breakers. Terminate cords with L14-30.
One (1) AKRON ERWC-10-28-4 W/200' OF 10/4 Reel to have left rear motor and rewind speed control box.  Install in front bumper center storage well with rewind speed control box and rewind button installed to left of reel. Label rewind button and speed controller.  Ensure roller assembly is secured tightly to front bumper treadplate/substructure. Ensure rollers are spaced properly like previous Ladder 10 for smooth cord transition.  Reel to be wired 240V w/20amp breaker. Terminate cord with L14-30.

## BUMPER ELECTRIC REEL

There will be located in the front bumper trough AKRON ERWC-10-28-4 W/200' OF 10/4.  The electric reel to have left rear motor and rewind speed control box.  Install in front bumper center storage well with rewind speed control box and rewind button installed to left of reel. Label rewind button and speed controller.  Ensure roller assembly is secured tightly to front bumper treadplate/substructure. Ensure rollers are spaced properly for smooth cord transition.  Reel to be wired 240V w/20amp breaker. Terminate cord with L14-30.

## LIGHT TOWER

A COMMAND LIGHT CL615-2MH 8000W will be supplied and mounted on the cab roof.

Install on cab roof with low profile spacers. Light tower to have (4) 1500w Command Light halogen heads and (2) 1000w metal halide. Light tower will NOT have backlight or strobe options.

**LIGHT TOWER GUARD**

An aluminum treadplate branch guard shall be provided, mounted in front of the light tower.

**SURFACE MOUNTED LED SCENE LIGHT**

One (1) Fire Research Spectra SPA260-J15 surface mounted LED scene light shall be provided. The lamp head shall operate at 240 volts AC, draw 1 amp, and generate 15,000 lumens of light. The light shall be mounted on the front face of the aerial platform and shall be controlled from a switch inside the platform and pedistol.

**SURFACE MOUNTED LED SCENE LIGHTS**

Two (2) Fire Research Spectra SPA260-J15 surface mounted LED scene light shall be provided. The lamps head shall operate at 240 volts AC, draw 1 amp, and generate 15,000 lumens of light. The lights shall be mounted under the aerial platform and shall be controlled from a switch inside the platform and at the pedestal.

**TELESCOPIC LED SCENE LIGHTS**

Two (2) Fire Research Spectra SPA547-J20-ON telescopic LED scene light shall be provided. The lamps head shall operate at 240 volts AC, draw 1 amp, and generate 20,000 lumens of light. The lights shall be installed on the rear of the aerial platform and shall be controlled from a switch located on the lamp head.

**ADDITIONAL 3-WAY SWITCH**

An additional 3-way switch shall be provided per the customer's location.

**AERIAL LOWER MAIN FRAME ASSEMBLY**

The mainframe assembly shall be mounted mid-ship on the chassis, forward of the pump and over the transmission. This shall leave the rear hose bed open for use of large diameter and regular fire hose.
An open tube or angle substructure for the mainframe assembly shall not be acceptable.
The main frame assembly base plate, located at the top of the assembly which supports and holds the turntable rotation bearing, will be a minimum 1" steel measuring 54" x 43". There shall be a minimum of two steel tension and compression bars mounted underneath, fore and aft, of the main frame assembly which

shall tie the aerial and chassis together. The bars shall function to withstand vertical torsional loads. The forward tension and compression bar shall be attached from the rear area of the front spring suspension hanger to the underside area of the mainframe assembly. The rear tension and compression bar shall be attached from the forward area of the rear spring suspension hanger to the under side area of the mainframe assembly.

**TURNTABLE BEARING**

The turntable bearing shall be constructed of steel. There shall be a minimum of 36 drilled and tapped holes in the turntable bearing.
The diameter of the turntable bearing shall be a minimum of 47". The turntable bearing shall be able to rotate 360 degrees in either direction on a one inch thick steel plate. The turntable bearing shall be bolted to the top of the main frame assembly using a minimum of 36 Grade 8 bolts.

**UPPER TURNTABLE**

The turntable shall be a minimum of one-inch thick plate and ninety-six (96) inches in diameter. The side plates to which the main base section of the aerial ladder is connected shall have a minimum height of four feet and shall include I-beam gussets of approximately fifty inches in length that tolerate the side thrust and tremendous forces to which the unit would be subjected.
The turntable shall be bolted to the turntable bearing using a minimum of 36 Grade 8 bolts.
The turntable shall be equipped with two removable aluminum sections for access into the pump.
The turntable side plates shall be positioned at a 45-degree angle (opposite the angle of the raise/lower cylinders) to act as a partial counter balance weight on the opposite side of the truck from the ladder extension.
The turntable shall be equipped with a rotating mechanism consisting of two hydraulically powered, planetary gear boxes that shall handle torque loads imposed by water hammer and hose breakage. The rotating mechanism shall give the turntable and boom built in coast as an added safety precaution to avoid lateral boom side-to-side deflection (reactionary whipping effect) caused by the boom being stopped suddenly.
A parking brake system shall be provided that is capable of holding the turntable in a stationary position regardless of the angle or extension of the aerial, while carrying the manufacturer’s rated load capacity with the waterway in operation and discharging water at the tip of the aerial fly section. An override shall be provided to release the parking brake when operating with the emergency auxiliary power unit.
The power operated turntable shall provide continuous rotating of the aerial structure clockwise or counter clockwise, thus enabling the structure to be positioned in any segment through 360 degrees. The rotating mechanism shall also provide sufficient power to rotate the aerial sections in any direction at any angle, fully extended, while carrying the manufacturer's rated load capacity with the waterway in operation and discharging water at the tip of the aerial fly section.
Provisions shall be made for emergency operation of the rotation system should loss of engine power occur. This shall be done through an auxiliary power unit that is capable of providing hydraulic power to safely rotate the aerial.

There shall be one heavy-duty steel pivot shaft that shall attach the base section of the boom (at the top and very back) to the top portion of the turntable side plates. The minimum steel shaft measurement shall be 34" long, 4" diameter with 1" wall thickness. Turntables using two separate attachments to hold and position the ladder in place shall not be acceptable.
The complete rotation system shall have built in relief to prevent damage from rotating the boom into buildings or from overloaded water streams. Suitable indicators, clearly visible at all times, shall be provided to facilitate correct alignment of the turntable with the bed of the boom. An automatic light shall be used to show correct alignment for bedding of the ladder from the turntable control station and the platform station.
Wide access steps to the turntable shall be provided on the left side of the apparatus.

**LEFT LOWER TURNTABLE ACCESS LADDER**

There shall be fixed steps located on the left side of the apparatus to access the turntable pedestal. The ladder shall be constructed of 1.25" heavy-wall aluminum tubing, and .25" diamond plate with a non-skid footing surface. Each step shall be 7" deep x 19.5" wide.

**LOWER FIXED STEP**

There shall be an additional fixed step located under the fixed steps on the left side of the apparatus to access the turntable pedestal. The step shall be 7" deep x 19.5" wide made of .25" thick diamond plate with a non-skid footing surface.

**LEFT UPPER TURNTABLE FOLDING STEPS**

There shall be up to two (2) Innovative Control fold-down steps with integrated step lights mounted on the left side of the turntable to allow easy access to the climbing ladder. The steps shall be constructed of Chrome-plated Zinc. Each step shall be securely bolted to the upper turntable side plate.

**RIGHT UPPER TURNTABLE ACCESS FOLDING STEPS**

There shall be up to two (2) Innovative Control fold-down steps with integrated step lights mounted on the right side of the turntable to allow easy access to the climbing ladder. The steps shall be constructed of Chrome-plated Zinc. Each step shall be securely bolted to the upper turntable side plate.

**INTERLOCK**

An interlock shall be provided that prevents operation of the aerial device until the chassis spring brakes have been set and the transmission has been placed in neutral or the transmission is in the drive position with the driveline to the rear axle disengaged.

An interlock shall be provided that allows operation of the engine speed control only after the chassis spring brakes have been set and the transmission is in neutral.

An interlock system shall be provided to prevent the lifting of the aerial device from the travel position until all the stabilizers are in a configuration to meet the stability requirements. The interlock system shall also prevent the moving of the stabilizers unless the aerial device is in the travel position.

**ROTATION LIMITING SYSTEM**

An aerial rotation limiting system shall be provided to notify and prevent the operator from rotating the aerial into a restricted position due to a "short-set" outrigger configuration. The system shall enable the operator to place the aerial in a 180-degree rotation to the opposite side of the apparatus than that of the "short-set" outriggers only.

The aerial shall automatically slow down when it approaches the limit of rotation travel.

The system shall be capable of rotating the aerial two degrees past the centerline of the apparatus on the "short-set" side to enable bedding of the aerial within the travel support structure without system cutout.

Audible warning alarms and LED indicators shall be provided to warn the operator they have reached the rotation limit and can also be used to assist with set-up and troubleshooting of the system.

**SMART BOOM WARNING SYSTEM**

This system shall warn both audibly and visually of impending contact with either the cab or the body of the truck.

When in an area of impending contact, the system shall shift the aerial controls into a reduced speed "creep mode" but shall not limit travel of the aerial.

Both rotation interlock and the smart boom warning system shall display information on a visual LED information center mounted at the turntable control pedestal and in the platform.

**ROTATION LIMITING ALARM**

A Floyd Bell US-09-515-S audible warning alarm and LED indicators shall be provided to warn the operator they have reached the rotation limit and can also be used to assist with set-up and troubleshooting of the system.

**HYDRAULIC SYSTEM**

A flange mounted 30 GPM hydraulic pump shall be driven by a power take off unit that is connected to the chassis transmission to provide the power required for operating the aerial. The hydraulic system shall have a minimum hydraulic reservoir for 65 gallons of special hydraulic fluid. The hydraulic reservoir shall be located at the left side of the lower mainframe assembly. The hydraulic fluid must be discharged through a fine mesh stainless steel strainer. Within the system, pilot operated check valves shall be incorporated so that all valves hold in their respective function(s). A ten (10) micron return filter of 40 gpm capacity, with replaceable cartridge, shall be provided.

The hydraulic system shall also incorporate automatic by-passes to compensate in the event the boom is forced into a building or the operator accidentally moving the control valve in the opposite direction while at full speed.

The hydraulic system shall provide coast in the lift cylinders to prevent the outrigger jack system from coming off the ground. This shall be accomplished through programmable platform controls that limit the acceleration and deceleration of the boom.

Intercooling of the hydraulic oil shall be accomplished through a built in heat exchanger to cool oil at all times.

All hydraulic lines shall be of the double braided type, with synthetic cover, rated at 12,000-psi burst pressure or above. A PTO hour meter shall be provided to record the time when the aerial hydraulic system is engaged.

**AUXILIARY HYDRAULIC POWER**

A 12-volt auxiliary pump shall be provided to supply emergency power to the hydraulic system. This system shall be operated off the truck batteries and provide limited but adequate power to operate the boom and outrigger jacks under emergency conditions.

**CONTROL PEDESTAL**

There shall be an aerial control pedestal located on the left side of the turntable. The control station shall encompass three electric over hydraulic proportional lever type controllers for raising/lowering, extending/retracting, and rotating the aerial device. The control valves shall be a proportional type to allow feathering characteristics during any operation.

The turntable pedestal controls shall have manual overrides within the console useable through an access door. The lower pedestal controls shall cancel the platform controls under all conditions.

The pedestal shall have removable panels for access to the hydraulic lines, valves and electrical wiring. There shall also be a hinged cover at the top of the control station for additional access. A safety guardrail shall be provided at the turntable pedestal control station to prevent the operator from falling. The lower pedestal controls shall completely override the platform controls under all conditions and shall be grouped in a convenient manner and properly illuminated for nighttime operation. Each pedestal hydraulic control shall

be equipped with electro-magnetic solenoids, which shall operate the hydraulic valves corresponding to the electrical controls mounted in the platform for aerial boom operation. The lower pedestal control station shall be situated so the operator can easily observe the platform while operating the controls.
The following additional items shall be mounted at the top of the turntable pedestal control station:

a] Automatic panel light to illuminate controls for nighttime operation
b] On/Off control switch for boom lights (one light mounted on each side of the boom)
c] Three-way switching with the Platform for optional ladder lighting
d] Three-way switching with the Platform or on/off control switch for other optional lighting
e] Three-way switching with the Platform for the rear bucket scene light
f] On/Off control foot switch for high speed control of the hydraulic system
g] Three-way switching with the Platform for "creep mode" for aerial control functions and indicator LED
h] Illuminated emergency push button to deactivate the platform controls with the turntable electric controls remaining operable.
i] Low breathing air system pressure warning LED indicator
j] Pedestal control power LED indicator
k] Platform control power Led indicator
l] Intercom communication system
m] Tag displaying functions for each pedestal boom operation
n] Tag displaying rated load capacity for the platform
o] LED indicators for cab and body damage (crush zones), jacks status, rungs aligned, tower aligned, rotation interlock, light tower (if truck is equipped with a light tower)
p] Audible alarm for cab or body damage (crush zones), rotation interlock stop (when short-jacked) and low breathing air
q] Interlock override button

**INCLINOMETER**

An illuminated inclinometer shall be provided and mounted in plain view of the pedestal operator location.

**BOOM ASSEMBLY**

An elevated platform of the telescopic design consisting of a minimum of five sections shall be provided.

The five sections produce a compact retracted length, allowing the platform to be positioned in tight or confined spaces at lower degrees of elevation. All sections shall be of the lightweight open lattice, non-crossing enclosed box design of truss type construction to obtain optimal stability at full horizontal reach. The telescoping sections shall be constructed from heat-treated 6061-T6 aluminum alloy material fastened by Aircraft type Huck bolts. There shall be no welding on the boom so as not to lower the yield strength of the material and cause torsional fracture, grain distortions and unequal conductivity. There shall be a minimum of 500 Aircraft type Huck bolts per section of boom. The base section of the boom shall have a section modulus of 468 $in.^3$ and a resisting bending moment of 16,000,000 in. lb. The base section shall also

consist of two heavy-duty steel side plates; one mounted each side of the boom. The steel side plates shall be Huck bolted into place and shall function to tie the boom, turntable, and lift cylinders together. There shall be trailing beams attached to the side plates that shall function to position and anchor lift cylinders into place and to distribute shock loads imposed by water hammer or hose breakage.

The boom shall be left in a natural aluminum finish. Painting the boom shall not be acceptable.

The boom shall have the capability to shed ice build up during freezing conditions.

**AERIAL SPOT LIGHTS**

Two (2) FireTech FT-WL-X-5-S-B LED spot lights shall be provided. One (1) shall be mounted on each side of the aerial base section to illuminate the aerial device for night time operation. The lights shall be activated by a switch at the pedestal.

**AERIAL PLATFORM DEVICE**

An aerial platform device with a minimum 100-foot vertical reach shall be provided. The height dimension shall be calculated with the boom at 80 degrees. The horizontal reach of the device shall not be less than 89 feet. The overall height of the apparatus with the aerial device in the bedded positions shall be no more than 11 feet 6 inches, and the overall length of vehicle shall be not more than 45 feet, 9-3/4 inches.

**CLIMBING LADDER**

A NFPA compliant climbing ladder with a full profile handrail starting at the turn table, and a standard handrail extending towards the platform shall be provided for a continuous escape way and accessibility to and from the platform. Each section of the ladder shall be attached to a specific boom section allowing the ladder to extend automatically at the same rate as the boom. The climbing area shall be free of cables, waterway and extension cylinders. The ladder climbing area shall be a continuous escape way free of all obstacles.

**LOAD CAPACITIES**

The following load capacities shall be established with the stabilizers at full horizontal extension and placed in the down position. Capacities shall be based upon full extension and 360 degree rotation.

**35 MPH WIND CONDITION (DRY)**

The aerial platform shall have a rated capacity of 1000 pounds at any elevation or extension. This condition shall be with “NO WATER” flowing or in the waterway.

**35 MPH WIND CONDITION (WET)**

The aerial platform shall have a rated capacity of 500 pounds at any elevation or extension. This condition shall be “WITH WATER” flowing or in the waterway.

**LADDER LIGHTING SYSTEM**

The climbing ladder shall be illuminated by FireTech FT-WL-2000-S-B 12V LED lights. The lights shall be spaced along the length of the boom to provide even lighting. The lights shall be activated by one (1) switch at the turntable pedestal and one (1) switch inside the platform.

**LIFTING CYLINDERS**

The raising and lowering mechanism shall consist of two hydraulic cylinders approximately 7" in diameter. The cylinders shall be attached to the boom assembly in a manner that requires only 50% of the lifting force. The cylinders shall be capable of lifting the full rated load of 1000 lb. with the boom at full horizontal extension with less than 1500 psi. hydraulic pressure.

The power operated raising and lowering cylinders shall provide movement of the ladder and platforms rapidly and smoothly without undue sway or vibration. A positive locking device shall be provided so the desired angle of elevation can be maintained indefinitely without dependence upon engine power.

As a safeguard feature, the lifting system shall be structurally and hydraulically designed and mounted to prevent rapid descent (lowering) of the aerial unit in the event of detachment, failure or hydraulic hose break. In the event of failure of any raising mechanism during operation, the gravity descent of the ladder shall be kept at a speed, which shall prevent damage to the equipment or danger to personnel. Provisions shall be made to prevent damage at full raise and lowering. There shall be a pilot controlled check valve on each cylinder.

**EXTENSION AND RETRACTION**

The boom and platform shall be extended by dual hydraulic rams mounted midway between the upper and lower main rails of the base section. The cylinders shall be mounted at the ends of the base section and supported through the middle to accommodate the load stress(s) of the boom.

The hydraulic cylinders shall extend the second section so that both cylinders hydraulically equalize and provide the additional safety feature of a double extension system. The extension/retraction cylinder shaft size shall be a minimum of 3" in diameter. Each cylinder rod shall have a tubular design to save weight.

The third, fourth, and fifth sections shall be connected to the second section of the boom by dual aircraft cables. This design feature shall eliminate the extra weight of hydraulic cylinders on the outer sections when extended to the side of the apparatus.

The design shall be such that the operating hydraulic pressures of the main system shall be 2,000 psi or less. Once again, as a safeguard feature, the system shall be structurally and hydraulically designed and mounted to prevent rapid descent (retraction) of the aerial unit should a detachment, failure or hydraulic hose break.

All sections of the boom shall extend and retract (slide) on special polymer slide blocks. Each slide block shall be bolted into place and shall be removable for inspection and maintenance. There shall be minimum of 44 slide blocks throughout the five sections of the boom for proper alignment and stability.

**WATER SYSTEM TO THE PLATFORM**

Water shall be supplied through a machine honed and fitted telescopic waterway constructed of high tensile aluminum. The waterway sections shall be provided with special pack gland type seals for minimum maintenance and the seals shall be located on the inside of the telescoping waterway. Waterway seals located on the outside of the waterway shall not be acceptable due to the decreased life expectancy caused by foreign particles and bad weather conditions damaging seals.

The waterway shall be completely enclosed by the boom sections with supports for the end of each waterway section. This shall leave the bottom side of each boom section completely free of extension/retraction cylinders, waterway supply line and waterway supports, hydraulic lines and nozzle(s) from possible damage due to the boom accidentally hitting against roof cornice or other types of constructions. The water supply line shall come directly off the main pump discharge manifold and shall be piped through smooth high pressure piping without the use of 90 degree chicksan joints, to reduce friction loss. A full flow ball valve to eliminate any possibility of water hammer on the waterway shall control the water flow. The water shall be passed through a special 4" passage-rotating swivel designed to also provide hydraulic passages and electrical circuits to the turntable. A 1.5” waterway drain valve shall be provided, and controlled from the pump operator’s panel.

Waterway piping immediately above the hydraulic swivel shall have one 90 degree elbow connected to a straight pipe attached to a reinforced smooth bore hose. There shall be no chicksan swivels or multiple bends or twists of the waterway pipe immediately above the hydraulic swivel, which would increase friction loss. The waterway diameter at the base section of the boom shall have a minimum inside diameter of 3-1/4" and shall finish in the fifth section of the boom with a minimum inside diameter of 5-1/4". This shall be done in order to decrease the friction loss as much as possible while increasing the water flow.

The waterway and platform nozzles shall have the capability of flowing a minimum of 2,000 gallons per minute.

Two (2) automatic relief valves, at the top and the bottom of the waterway, shall be provided in to eliminate any damage to the waterway by pressure shock or retracting the boom with the drain valve closed.

**OUTRIGGER GROUND JACKS**

The outrigger control station shall be located in the L1 compartment. An indicator panel to aid setup of the ground jacks is located next to the L1 compartment. The single outrigger control station shall control all outrigger operations allowing for a one-person operation and quick set-up.

Individual manual control valves shall be supplied for each mode of outrigger operation. There shall be a plaque located next to each control displaying the function.

A two position hydraulic transfer valve (diverter valve) shall be installed to direct hydraulic power to either the outrigger operations or the boom operations to prevent operation of both circuits at the same time.

Fluid capacity plate for all lubricants and filter part numbers shall be provided.

There shall be four other controls located at the outrigger control station:

a] aerial interlock override push button control to allow the boom to be raised from the nested position if an outrigger is “short-set”

b] auxiliary hydraulic motor push button control

c] high speed push button control for the hydraulic system

d] upper power/hydraulic transfer switch that turns control power on/off to the pedestal and platform. The switch also permits hydraulic fluid flow to the pedestal control valves.

The mid-ship mounted outrigger jack rams shall have a minimum bore and stroke of 5"x 23". Outriggers that employ exposed hydraulic lines shall not be acceptable.

The extendable outrigger stabilizers, when fully extended, shall have a spread of 20 feet. The stabilizer sections shall have a minimum overlap of 43" for safety and stability. The stabilizers shall be operated independently or simultaneously and may be positioned to accommodate obstructions such as curbs, pavement depressions, parked vehicles, or any other hindrance. The extendable portion of the outrigger stabilizers and the support in the mainframe shall be constructed of reinforced structural tubing, Type A500

Grade B or equivalent. Poly wear pads shall be installed between inner and outer tubes. The extendable portion of the outrigger shall ride on UHMW (ultra high molecular weight) slideblocks.

There shall be two rear jacks located directly behind the rear tandem axle area, one each side of the vehicle, designed to extend straight down to take the weight off the rear suspension system. This shall enable the vehicle to be set up in tight or confining spaces with cars, additional fire apparatus, or other obstructions nearby.

Any beam or contributing structural member, through which the jacks supports the weight of the boom (aerial sections), or any position of the apparatus plus the live loads peculiar to fire fighting operations, shall be of ample strength to carry these loads without evidence of stress, bending, twisting or other failure(s). Pilot operated check valves shall be incorporated on each jack cylinder and manual pin locks shall be provided for each main outrigger jack, for additional safety.

There shall be an audible alarm and warning light that are automatically activated when the outriggers are being deployed.

**OUTRIGGERS, PINLESS**

Each outrigger shall incorporate pressure and proximity sensors to display outrigger position at the operators panel during initial setup or final stow position.

**AERIAL JACKS ALARM**

An Ecco DT500 alarm shall be audible when the aerial jacks have been deployed either in the short jack mode or in fully deployed operations.

**OUTRIGGER SPOT LIGHTS**

Two (2) FireTech FT-LZC2-4-B Laser Cannon lights shall be provided. One shall be mounted on each side on the apparatus to illuminate the area of the outriggers at full extension. The lights shall be activated by a switch inside the cab near the driver or when the parking brake is activated.

**OUTRIGGER DISPLAY PANEL COVER**

The outrigger position display panel cover shall be made of clear plexiglass to allow visible access to the outrigger position indicators and be hinged at the bottom to allow access to outrigger for service. The panel shall be sealed to not allow water in the locked position. It shall be secured in place with two (2) latches in the upper corners.

**OFFICER'S SIDE OUTRIGGER COMPARTMENT**

A compartment shall be located between the officer's side outrigger and pump panel. There shall be a painted hinged door with D-Ring slam latch, gas strut and LED strip light inside. The compartment shall measure 13.25"W x 16.5" H x 24"D.

**OPERATIONAL TEST**

After starting the engine, setting the jacks and transmitting power to the platform, a complete cycle of the platform operation shall be carried out as follows: With one person operating the machine from the platform control station, raise the platform from horizontal, rotate through a 90 degree turn and extend to full specified height. This shall be completed in less than 150 seconds, smoothly and without vibration. The platform shall then be retracted and lowered to its starting position after which a thorough inspection shall be made of all moving parts with special attention given to the platform leveling system.

This test shall be repeated employing the controls at the lower pedestal control station. The effectiveness of the lower control override shall be demonstrated.

**AERIAL DEVICE TEST & CERTIFICATION**

The aerial device shall be tested and certified by a third party independent testing agency. The aerial device shall be inspected and tested in accordance with the requirements of NFPA 1911, including all non-destructive testing (NDT) prior to being subjected to the tests defined in NFPA 1901. These tests shall include a stability test, horizontal load test, and an aerial device water system test.

**SECONDARY CAMERA**

There will be a monitor located in the hydraulic jack compartment and the camera placed to view jack placement.

**PLATFORM AND EQUIPMENT**

The platform shall be constructed of heat reflecting reinforced aluminum to protect occupants against flash fires and freezing weather. The platform shall have a minimum floor area of 19.5 sq. ft. and shall be provided with closed sides, 42" high all around. The platform shall be completely enclosed along the floorboard to protect occupants. There shall be four doors in the platform, two in the front and two in the rear, each of which shall be provided with a suitable safety latch. All doors shall latch and open inward to avoid accidentally falling from the platform.

A total of four (4) anchor points shall be provided within the platform for the attachment of safety harnesses.

A slip-resistant front access step shall be provided, full width of the platform, approximately 8-1/2" wide. The front corners shall be chamfered for accessibility to parapets and roofs.

Drain openings shall be provided to prevent water accumulation in the platform.

The platform-supporting member shall be a welded steel fabrication in the form of a yoke. The yoke supporting tube shall be bolted to the fly section of the boom. The platform shall be attached to the yoke supporting tube through two swivel points, one each side, above center. The position of the supporting yoke tube shall enable the platform to reach over roof cornices and other obstructions and position the platform directly on top of the roof without damaging the platform undercarriage, waterway supply line, hydraulic lines or boom sections.

A platform leveling system shall be provided and so designed that the platform together with its rated load shall be supported and maintained level in relation to the turntable regardless of the position of the boom or sections. This shall include dual hydraulic cylinders on each side of the platform (four cylinders total) and a self-contained hydraulic leveling system (fully enclosed) in the end of the boom so that no hydraulic lines, reel or base controls have to travel through the telescoping sections, helping to eliminate service problems or failure of the leveling system due to ruptured lines or leaking reels. The platform pivots shall be mounted above center (characteristic of a ferris-wheel suspension) to prevent dumping the platform should a malfunction of the leveling system occur. As a safety feature, should a malfunction occur, there shall be an emergency manual override control to level the platform.

**PLATFORM BOOM OR SECTION BED LOCK**

An interlock system shall be provided which shall prevent action and movement of the retracted elevating platform boom or sections in their bed until the ground jacks are placed in position to stabilize the vehicle.

**LOAD LIMITATIONS**

Load instruction plates shall be located at the turntable pedestal control station and the platform control station indicating the safe load of the platform. The platform shall carry the rated load capacity indicated in

the following manner: raise, extend, rotate, retract and lower without exceeding the hydraulic pressures prescribed by the manufacturer. Extensions, retraction, and elevation functions can be operated simultaneously.

THE PLATFORM SHALL BE CAPABLE OF CARRYING ITS RATED LOAD SAFELY IN ANY POSITION OF OPERATION ACCORDING TO NFPA #1901.

**PLATFORM ACCESS LADDER**

There shall be an aluminum treadplate access ladder furnished near the rear of the body, on the left side, to access the platform. The ladder shall be furnished with a drop down aluminum step to allow easy access when the vehicle is set-up on the outriggers. Each step will be illuminated for night operation.

**PLATFORM CONTROLS FOR BOOM OPERATION**

The platform control station shall be on the forward wall of the platform, centered for ease in operator viewing while operating the platform. The three controls shall control the functions of raising and lowering, extension and retraction and rotation of the aerial. The placement of the controls shall conform to NFPA. The controls shall be of the electronic type. This system shall provide diagnostic functions to aid in trouble shooting as well as programmable features to control speed, acceleration and deceleration. The controls shall be lighted for nighttime operation. All electrical connections to the control panel shall be made through waterproof connections and be easily removed or replaced for service. The following additional items shall be located at the platform control station:

a] On/off control switch for light to illuminate controls for nighttime operation.
b] Foot operated switch for high-speed control of the hydraulic system.
c] A button to activate “creep mode” of the aerial operation.
d] Slave intercom station allowing "hands free" operation of the intercom.
e] A "rungs aligned for climbing" for all high-handrail aerial ladder platforms.
f] On/Off control for Platform Control Power
g] Three-way switching with the Pedestal for optional ladder lighting
h] Three-way switching with the Pedestal or on/off control switch for other optional lighting
i] Three-way switching with the Pedestal for the rear bucket scene light
j] On/Off control foot switch for high speed control of the hydraulic system
k] Three-way switching with the Platform for “creep mode” for aerial control functions and indicator LED
l] Low breathing air system pressure warning LED indicator
m] LED indicators for cab and body damage (crush zones), jacks status, rungs aligned, tower aligned, rotation interlock, light tower (if truck is equipped with a light tower)
n] Audible alarm for cab or body damage (crush zones), rotation interlock stop (when short-jacked) and low breathing air

A red vinyl cover shall be provided to cover the control panel in the aerial platform. The cover shall be secured at the top and snaps shall be used at the bottom.

**INCLINOMETER**

An illuminated inclinometer shall be provided and mounted in plain view of the aerial platform operator.

**PLATFORM CONTROL COVER**

A diamondplate cover shall be provided over the control panel in the aerial platform. The cover shall be secured with a hinge at the top and latched at the bottom.

**LIGHT GUIDE RODS**

An amber light guide rod shall be provided, one each side of yoke.

**120 VOLT CIRCUIT TO PLATFORM**

One (1) 15 amp electrical circuit utilizing 12 gauge 3 conductor electric cable shall be provided to the tip of the ladder. The circuit shall be wired from an enclosed terminal strip below the turntable through the collector ring assembly.

One (1) (NEMA-L5-20) female, three-prong, twist lock receptacle, with environmental cover, shall be located below the aerial platform controls.

**WATER CURTAIN**

A water spray system shall be provided beneath the platform and controlled by a hand operated valve inside the platform. The spray system shall provide 75 GPM of water in a 25 ft. diameter water curtain below the platform. As a safety factor, one or both turret nozzles may be directed straight down for large volumes of water directly below.

**AUXILIARY YOKE OUTLETS**

Directly behind each turret a 2-1/2" NST outlet, reduced to an 1-1/2" with cap and chain, shall be provided as auxiliary outlets with gate valves near the platform. A hose carrier for 50 ft. 1-1/2" hose shall be provided in the platform.

## YOKE DRIVERS SIDE 4" ELECTRIC VALVE

Install on driver's side yoke in place of the standard 4" manual butterfly. Valve to be controlled from the pedestal and inside the platform an Akron 9323 valve controller. Valve body/actuator to be left natural finish (not painted).

## ROPE ROLLERS

There will be rope rollers in place of a lifting eye at the tip of the ladder.

## FRONT BUCKET TIE OFF POINTS

There will be installed on the front left and right front face of the bucket is install (1) each side on upper front corners.

## DRIVER'S SIDE PLATFORM MONITOR

The driver's side platform monitor shall be a Task Force Tips Monsoon RC model #Y4-E. The monitor shall be constructed from hardcoat anodized aluminum with a silver powder coat interior and exterior finish. The monitor shall have a flow capacity of 1250 GPM. It shall be attached directly to the platform supporting yoke with a Task Force Tips electric Valve Under Monitor (VUM) to control the flow of water. The monitor and VUM shall be controlled by two (2) model #Y4E-RP panel mounted controllers. One (1) shall be installed at the pedestal and one (1) shall be installed inside the aerial platform. A model #YE-RF-900 hand-held wireless controller shall also be provided and installed in a location to be determined by the fire department.

## DRIVER'S SIDE MONITOR NOZZLE

The monitor shall be equipped with a Task Force Tips model #M-ERP1250-NJ nozzle. The flow pattern shall be adjustable with the electric controls.

## OFFICER'S SIDE PLATFORM MONITOR

The officer's side platform monitor shall be a Task Force Tips manual Monsoon model #Y4-M with dual hand wheel controls. The monitor shall be constructed from hardcoat anodized aluminum with a silver powder coat interior and exterior finish. The monitor shall have a flow capacity of 1250 GPM. It shall be attached

directly to the platform supporting yoke with a Task Force Tips manual Valve Under Monitor (VUM) to control the flow of water.

**OFFICER'S SIDE MONITOR NOZZLE**

The officer's side monitor shall be equipped with a set of Task Force Tips model #MST-4NJ quad stacked tips and a Task Force Tips model #XF-SS10 stream shaper.

**INTERCOM**

A Fire Research ACT Intercom model ICA900-112 two-way system shall be installed between the aerial operator's position and the aerial platform. The intercom kit shall include two control modules, one that is hands free and one that has a push-to-talk button, two speakers, and cables. The interconnection between control modules shall require two wires. The control modules shall have an LED volume display and push-button volume control. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall be designed for exterior use. The control module shall be no more than 2 7/8" high by 5 1/8" wide by 1 7/8". The speaker shall be no more than 5 1/8" high by 5 1/8" wide by 1 1/2" deep. The power requirements for each control module with a speaker shall not exceed 1/2 amp at 12 VDC.

**BREATHING AIR SYSTEM**

A breathing air system shall not be provided.

**PARAPET LADDER**

There shall be a two-section ladder assembly pivoting off of the front step of the platform that permits access over parapet walls and onto roof surfaces. The ladder shall be self-storing and easily deployed and retracted using a gas spring assisted lever.

**STOKES ARMS**

There shall be two arms mounted under the front step of the platform that swing out and lock in the deployed position to provide support for a full size stokes basket and victim. The arms and platform shall have six anchor points to securely tie down a basket and victim.

**STOKES STORAGE BOX**

A storage box shall be attached to the side of the base section of the aerial for the storage of a Stokes style rescue stretcher. The box shall be constructed from smooth aluminum plate, and shall be provided with a polished aluminum treadplate lid. The boom sign shall be mounted to the outside of the box.

**LIFTING EYE**

A single lifting eye shall be attached to the fly section of the boom for the purpose of hoisting a stokes basket. When a stokes basket is suspended from the eye, the basket shall be able to be reached by an attendant in the platform. Capacity of the eye shall be 800 lb. and any weight suspended from it shall be subtracted from the rated capacity of the platform.

**CORROSION REDUCTION POLICY**

It is understood that fire apparatus will operate in harsh environments. The Sutphen Corporation has in place a formal corrosion reduction program and detailed assembly procedures, designed for reducing and eliminating the possibility of corrosion. A formal program following the processes as set forth in ASTMB117, and is described below.

Frame Rails

The chassis frame rails shall be coated with a high performance, two component, reinforced inorganic zinc rich primer with a proven cathodic protection makeup preferably Cathacoat 302HB. The surface shall be clean and free of all salts, chalk and oils prior to application. Were the primer has been broken during the frame assembly process the area shall be touch up to reestablish the seal. Prior to finish paint a second primer Devran 201 shall be applied. Once the assembly of the frame is complete and the second primer is applied the entire assembly shall be covered with high quality top coat paint preferably Imron 5000 or equal.

Electro Plating

Steel and Iron brackets such as the pump module bracket shall be Zinc or cadmium plated to protect against corrosion. Plating shall be in accordance with ASTM B663.

Fasteners

In any area that a stainless steel screw or bolt head is to come in contact with aluminum or steel, painted or non-painted, the fastener shall have the underside of the head pre-coated with nylon. The nylon coating shall act as a barrier between the fastener head and the metal or painted surface.

Screw or bolt taped into the metal shall be pre-coated with a Threadlocker type material pre-applied on the threads.

When bolting together stainless steel the pan-head bolts with nylon coating under the head, a stainless washer with a rubber backing, and a Stover flange nut to secure the bolt, shall be utilized.

When mounting aluminum components such as a step to the apparatus body, stainless steel washers with rubber backing shall be used. All mounted components shall utilize barrier material between the two surfaces.

All rivet or huck type fasteners shall be of the same material being secured.

Whenever possible, holes shall be pre-drilled and taped when mounting components such as lights, steps, and hand rails prior to the paint process to reduce the corrosion opportunity. If a hole must be drilled into a previously painted surface, the paint barrier around the hole shall be re-established and a flange-type nutsert with a gasket under the flange shall be used.

When possible, the use of stainless trim screws shall be minimized. Structural tape and or adhesive shall be used were possible for mounting trim to the body or cab.

If a pre-treated screw or bolt is not available, hand applied Dynatex Boltlocker or Theadlocker shall be placed on the threads of the screw, bolt or nutsert. This will help seal threads from moisture and help prevent the fasteners from loosening. If lubricant is used when tapping the hole, the hole will be cleaned of lubricant and the shavings before applying.

Barrier Tape

Barrier tape shall be used on the backsides of all lights, trim pieces, or other components when bolting them to the apparatus; also when attaching stainless steel over an aluminum surface or when attaching aluminum treadplate to the stainless steel. All instances of dis-similar metals contacting each other require the addition of barrier tape between the metals where contact is made.

Before applying the tape, all metal surfaces shall be clean from oil or dirt with a 50/50 mix of alcohol and water or a similar solvent.

Gaskets

Gaskets shall be used under all snaps, loops and fasteners for such items as for hose bed covers. The paint seal shall be re-established around the mounting hole edges after drilling.

Rollup Doors

1 3/4" X 1/16” barrier tape shall be used on the frame opening to act as barrier between the aluminum door rail and the painted door opening surface.

Hinged Doors
Barrier tape shall be applied to the painted surface of the body and on the painted hinge side of the door.

Painting Steel
Steel shall be wiped of any oil residue, rust, and weld slag or smoke shall be removed. All surfaces shall be cleaned with solvent, primed, and then sprayed with a topcoat. After bolts are tightened to the proper torque, bolts shall be touched up with primer or cold galvanizing coating.

Mounting Emergency Lights and Options
All emergency lights, accessory mountings, Kussmaul covers, and 110 outlet boxes mounted to the body should be mounted with pre-coated Threadlocker and nylon under the head screws or bolts to minimize corrosion between dissimilar metals.

Electrical Grounding
Grounding straps shall be installed consisting of a minimum 2-gauge strap bolted to the chassis frame.

A ground cable from the cab to the right side frame rail
From the alternator to the right side frame rail
From the pump module frame to the right side truck frame.
Aerials: from the hydraulic and pump module framework.
From the pump mount to the truck frame rail.
From the body module to the right side truck frame.

Proper grounding will help eliminate grounding problems, and will reduce the possibility for electrolysis and corrosion to occur, as a result of impressed current be presented to the chassis. All electrical connection points shall be sprayed with electrical sealer as necessary.

SALT SPRAY TESTING

All fasteners and coatings have been chosen after extensive salt spray testing. Salt spray tests are used to confirm the relative resistance to corrosion of coated and uncoated metallic specimens, when exposed to a salt spray climate at an elevated temperature. Test specimens are placed in an enclosed chamber and exposed to a continuous indirect spray of neutral (pH 6.5 to 7.2) salt water solution, which falls-out on to the specimens at a rate of 1.0 to 2.0 ml/80cm²/hour, in a chamber temperature of +35C., steady state condition.

Method
Salt fog testing is performed by placing samples in a test cabinet that has been designed in accordance with Paragraph 4 (Apparatus) of ASTM B117 and operated in accordance with Paragraph 10 (Conditions) of ASTM B117.

A 5% salt solution, prepared by dissolving sodium chloride into water that meets the requirements of ASTM D1193 Specification for Reagent Water, Type IV is supplied to the chamber. At the time the samples are

placed into test, the cabinet is pre-conditioned to the operating temperature of 35ºC and fogging a 5% salt solution at the specified rate.

Orientation
The samples are placed at a 15-30 degree angle from vertical or tested in the “installed” position. This orientation allows the condensation to run down the specimens and minimizes condensation pooling. An important aspect of the test is the utilization of a free-falling mist, which uniformly settles on the test samples. This simulates a “real world” condition.

Test durations
Test durations are 500 hours, and the test cabinet will remain closed for the duration of the test.

**PAINTING**

The apparatus shall undergo extensive pre-paint preparation. All cab and body trim parts are to be removed prior to painting. All appliance-mounting holes are to be drilled and de-burred prior to painting. This allows mounting holes to be primed and painted. Before prime and finish coats are applied, the complete apparatus shall be properly prepared and treated to permit the best possible adhesion of the primer and finish coats. All materials used in the paint process shall be of the of the highest quality available. Modern methods shall be employed to assure the finest finish surface possible. All priming, surfacing and painting shall be done in a modern down draft or cross flow paint facility. Experienced personnel trained by the paint manufacturer shall perform all paint application in order to provide the highest quality and most enduring paint finish available. Both aluminum and steel surfaces to be painted shall be primed with a two (2)-component primer which is compatible with the finish coat. The apparatus shall be finish painted with a polyurethane base/clear system. “No Exception”
Utilizing the stainless steel body fabrication, the interior of all compartments, inside hose bed and surrounding areas adjacent to compartments doors shall remain a #4 brushed stainless steel finish. This practice shall eliminate the possibility of paint chipping, and electrolysis of aluminum, which can cause corrosive action between dissimilar metals. The chassis, compartment doors, front and rear jack doors, and rear fender panels shall be painted the color indicated.
A barrier gasket/washer of "High Density Closed Cell Urethane Foam" shall be used behind all lights, handrails, door hardware and any miscellaneous items such as stainless steel snaps, hooks, washers and acorn nuts. The gaskets/washers shall be coated with pressure sensitive acrylic adhesive. All screws used to penetrate painted surfaces shall be pre-treated/coated under the head with nylon and the threads shall have pre-coat #80. This procedure shall be strictly adhered to for corrosion prevention and damage to the finish painted surfaces.
The following paint process shall be utilized:
Surface Preparation:
1. Wash surface thoroughly with mild detergent.
2. Clean and de-grease with Prep-Sol 3812S.
3. Sand and feather edge using 400 grit or finer on a dual action sander.

4. Remove sanding dust with a cleaner compatible with polyurethane base coat/clear coat final finish.
Substrate treatment:
1. Use a Metal Conditioner followed with a Conversion Coating product.
Priming:
1. Use a priming 615S pretreatment.
2. Use a self etching primer applied to achieve a 1.5 mil dft minimum.
3. Use Prime N Seal sealer compatible with polyurethane base coat.
Color Coat:
1. Apply polyurethane base coat 1-2 mil dft minimum.
Clear coat:
1. Apply polyurethane clear coat 2 mil dft minimum.

**SINGLE TONE PAINT**

A single paint color shall be provided for the apparatus.

**PAINTED FRAME**

The frame rails, fuel beam, and body subframe shall be painted glossy black.

**TURNTABLE PAINT**

The turntable, side plates and lift cylinders shall be painted the same color as the apparatus.

**ADDITIONAL PAINT PACKAGE**

The ladder sheaves, extension cylinder and yoke shall be painted the same color as the apparatus.

**AIR CONDITIONING CONDENSER**

The air conditioning condenser shall be painted to match the cab roof.

**CHEVRON STRIPING, LADDER CHUTE DOOR, ORAFOL REFLEXITE**

The ladder chute door shall have 6” red and yellow reflective Reflexite Chevron style striping affixed to it. The striping will be set in a manner to have the effect of an inverted “V” shape. The stripe will travel low to high from the outside to the inside.

**CHEVRON STRIPING, REAR BODY OUTBOARD, ORAFOL REFLEXITE**

The apparatus shall have 6” red and yellow reflective Orafol Reflexite Chevron style striping affixed to the outboard rear body panels. The striping will be set in a manner to have the effect of an inverted “V” shape. The stripe will travel low to high from the outside to the inside.

**BOOM SIGN**

A boom sign, approximately 88" x 26", shall be provided on each side of the boom. The background of the boom sign shall be painted primary truck color.

**BOOM SIGN LETTERING**

Up to twenty (20) 12" 22KT Gold laminated goldleaf letters, with left hand shading and right hand outline to equal 12-5/8" letter, shall be provided on each boom sign.

**MISCELLANEOUS EQUIPMENT FURNISHED**

1 pt. touch-up paint

A bag of stainless steel nuts and bolts, as used in the construction of the apparatus.

**WHEEL CHOCKS**

ESCANDIDO, CA ENGINES WHEEL CHOCKS NOT FOLDING STYLE.

**PIKE POLE STORAGE**

Three (3) storage tubes shall be recessed each side of the rear compartment for pike pole storage. A spring-loaded clip shall be installed near each tube to secure the head of a standard pike pole.

**OPERATION AND SERVICE MANUALS**

Complete "Operation and Service" manuals shall be supplied with the completed apparatus, one (1) printed copy and one (1) USB flash drive. Service manual instructions shall include service, maintenance and

troubleshooting for major and minor components of the truck. The apparatus manufacturer shall supply part numbers for major components (i.e. Engine, Axles, Transmission, Pump, etc.). A table of contents, hydraulic, air brake and overall apparatus wiring schematics shall be included.

A video demonstration DVD on the operation of the truck shall be supplied with the manuals.

Additional operator and maintenance manual(s) shall be provided.

**DELIVERY**

The custom built fire apparatus shall be driven from the manufacturing facility to the community by a factory trained delivery engineer who shall thoroughly demonstrate the complete apparatus operation and maintenance to the fire department designated personnel.

**WARRANTIES**

The following warranties shall be supplied. See warranty documents for complete coverage details of each warranty provided.
The apparatus shall be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus shall be covered for parts and labor costs associated with repairs for a period one (1) year.

Life-time warranty on the frame.

Ten (10) year cab structural warranty.

Ten (10) body structural warranty.

Ten (10) year warranty on paint.

Two (2) year aerial mechanical warranty.

Thirty (30) year aerial structural warranty.

The OEM warranties shall be applied for all major components.

**MANUFACTURING & LOCATIONS**

The apparatus will be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, and service shall be provided on a 24 hours around the clock basis. The company shall

maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.

**COMPARTMENT FLOORING**

The compartment floors will have stall matting or Turtile Tile installed in desired locations.

**EQUIPMENT & MNT PACKAGE**

Equipment shall be provided and installed as mutullay agreed upon between the purchaser and the Manufacturer. A list is included with the proposal and mounting out of the $215,893.07 Allowance.

**COMMUNICATION PACKAGE**

A communications package shall be provided and installed as mutually agreed upon between the Purchaser and the Manufacturer.
The following described will be mounted.
The following described will be mounted.
1.) One(1) Model LP 800 800MHZ Radio Antenna & Cable
2.) One (1) Model AP-CCWG LTE/Cell/PCS/GPS Antenna
3.) One (1) Model SD-PAN Havis Docking Station for Panasonic
4.) One (1) Magnetic Mic Mount
5.) One (1) Firecom Intercom System will be provided (Two (2)Wireless Heads Position Driver,Officer * four (4) Hard wired for the crew seats.
7.) One (1) Pump Panel Speaker with Switch

**LAPTOP PKG**

One (1) CF-334Z-2AAM PANASONIC RUGGED CF33 TABLET 12" - WIN 11 PRO INTEL CORE I7-10810U 1.1GHZ 5.2GHZ), VPRO, 12.0" QHD GLOVED MULTI TOUCH+DIGITIZER, 16GB, 512GB OPAL SSD, INTEL WI-FI 6, BLUETOOTH, 4G , GPS, DUAL PASS (CH1:WWAN/CH2:GPS), INFRARED WEBCAM, 8MP REAR CAMERA, SERIAL (TRUE), STANDARD BATTERIES (2), TPM 2.0, FLAT, 3 Year Protection Plus no fault warranty. 3 year premier deployment and imaging. FZ-SVCLTNFY4 Protection Plus Warranty 4th year.

One (1) H-33-TVD2-L PANASONIC RUGGED CF33 TABLET VEHICLE DOCK - HAVIS TABLET LITE VEHICLE DOCK (DUAL PASS) FOR THE PANASONIC CF-33 TABLET ONLY. USB 2.0 (4), USB 3.0 (2 SERIAL, ETHERNET (2), DOCKING CONNECTOR, DUAL RF, POWER, RELEASE LEVER, LOCK (KEYED ALIKE). NOT COMPATIBL WITH TABLETS THAT HAVE BOTH LONG LIFE BATTERIES AND PANASONIC ROTATING HAND STRAP.
One (1) CF-LNDDC120 PANASONIC RUGGED TABLET & LAPTOP CAR CHARGER - Lind 120 Watt 12-32 Volt Input Car Charger for CF-30, CF-31,CF-33, 4K Mk1, Mk2 (UT-M/FZ-Y1), CF-53 Mk4, CF-54, FZ-55, CF-SX2,

CFF9,
CF-19, CF-20, CF-C2, CF-H2, CF-U1, FZ-G1, G2
One (1) FZ-SVCLTNFY45 PANASONIC ADD 5th YEAR WARRANTY
One (1) Panasonic US Accessory, Power Supply Mounting Bracket CF-LN D

**RADIO PKG**

One (1) G174AD ANT 3DB LOW-PROFILE 762-870
One (1) G361AH ENH: P25 TRUNKING SOFTWARE APX
One (1) QA09113AB BASELINE RELEASE SW
One (1) G996AS ENH: OVER THE AIR PROVISIONING
One (1) G66BJ DASH MOUNT E5 APXM
One (1) QA03399AA ENHANCED DATA APX
One (1) RADIO AUTHENTICATION

**INSTALL**

The customer supplied Knox box and TIC will be installed in the cab in a location determined by the customer.

**FIRE COM HOOKS**

There will be sixteen (16) Fire Comm Hooks supplied and in a location determined by the customer. Six (6) will be utlized for headset hangers.

**KUSSMAUL SUPER 30 AUTO EJECT**

**120-VOLT OUTLET WIRED TO SHORELINE INLET**

Five (5) 120-volt outlets shall be provided and wired to the shoreline inlet. The location of the outlet shall be determined during the pre-construction conference.

**EXTERIOR DOOR**

The exterior compartment shall have a hinged door. The door shall have an Austin Hardware slam catch single-point "D"-ring door closure and held open with gas struts.

**DOOR HINGE**

The door shall be hinged to open towards the front of the cab.

**TEXTURED FRAME RAIL COATING**

The area of the frame rails where the pump module shall be located. Shall be applied with a textured coating that matches the frame rail color.