

CITY COUNCIL AGENDA ITEM COVER MEMO

Agenda Item Number _____

Meeting Type: Regular

Meeting Date: 3/14/2013

Action Requested By:
Fire and Rescue

Agenda Item Type
Resolution

Subject Matter:

Agreement for the Reburishing of Ladder 11

Exact Wording for the Agenda:

Agreement between the City of Huntsville and Kovatch Mobile Equipment Corporation, t/a KME for the Refurbishing of a 1989 Grumman Ladder truck known as Ladder 11.

Note: If amendment, please state title and number of the original

Item to be considered for: Action

Unanimous Consent Required: No

Briefly state why the action is required; why it is recommended; what Council action will provide, allow and accomplish and; any other information that might be helpful.

Huntsville Fire and Rescue has determined it is in our best interest to recycle some major components of this truck. The result will be a new ladder truck with a full factory warranty with a significant savings over building a new truck.

Associated Cost: 756,415.00

Budgeted Item: Not applicable

MAYOR RECOMMENDS OR CONCURS: Yes

Department Head: _____

Date: 3/5/2013

**ROUTING SLIP
CONTRACTS AND AGREEMENTS**

Originating Department: Fire and Rescue Council Meeting Date: 3/14/2013

Department Contact: Lesley Easter Phone # 5053

Contract or Agreement: Agreement between the City of Huntsville and Kovatch Mobile Equipment Corp

Document Name: KME Ladder 11 Reburb

City Obligation Amount: 756415.00

Total Project Budget: 756415.00

Uncommitted Account Balance:

Account Number: 01-5300-0804- TBD

Procurement Agreements

<u>Title 41</u>	<u>Sole Source</u>
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Grant-Funded Agreements

Not Applicable	Grant Name: <u></u>
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Department	Signature	Date
1) Originating	<i>Michael F. Sublett</i>	3/6/13
2) Legal	<i>Mary C. Cates</i>	3/8/13
3) Finance	<i>[Signature]</i>	3/11/13
4) Originating		
5) Copy Distribution		
a. Mayor's office (1 copies)		
b. Clerk-Treasurer (Original & 2 copies)		

RESOLUTION NO. 13- _____

BE IT RESOLVED by the City Council of the City of Huntsville, Alabama, that the Mayor is hereby authorized to enter into an Agreement, by and between the City of Huntsville, a municipal corporation in the State of Alabama, and Kovatch Mobile Equipment Corporation, t/a KME, which said Agreement is attached hereto and identified as "Agreement between the City of Huntsville and Kovatch Mobile Equipment Corporation, t/a KME for the refurbishing of a 1989 Grumman Ladder truck known as Ladder 11" consisting of five(5) pages numbered A-E, the twelve(12) page Quotation, four(4) pages Clarifications and Exceptions, and one hundred twenty-one(121) page Proposal and the date of March 14, 2013, appearing on the margin of the first page, together with the signature of the President or President Pro Tem of the City Council, and executed copy of said document being permanently kept on file in the Office of the City Clerk-Treasurer of the City of Huntsville, Alabama.

ADOPTED this the 14th day of March, 2013.

President of the City Council of
the City of Huntsville, Alabama

APPROVED this the 14th day of March, 2013.

Mayor of the City of Huntsville,
Alabama



AGREEMENT OF SALE FOR FIRE APPARATUS

THIS AGREEMENT is made between Kovatch Mobile Equipment Corp., t/a KME, of One Industrial Complex, Nesquehoning, Pennsylvania, ("Company") and:

City of Huntsville

Legal Name of Buyer

815 Wheeler Avenue Huntsville Madison Alabama 35801

Address

City

County

State Zip

(256) 427-7401

"Buyer" Phone Number

BUYER INFORMATION (check one):

Municipal Corporation Non-Profit Corporation

Business Corporation Sole Proprietorship

Other (specify): _____

State of Incorporation: AL Date of Incorporation: _____

1. ACCEPTANCE: Company agrees to sell and Buyer agrees to purchase the fire apparatus ("Apparatus") described in the Specifications incorporated as Exhibit A of this contract, as may be amended in writing, and the equipment listed herein, all in accordance with the terms and conditions set forth herein.

2. DELIVERY SCHEDULE: The Apparatus shall be ready for delivery F.O.B. HFR at approximately 365 days after receipt of Contract Chassis subject to extension due to changes made by Buyer or in accordance with Sections 5 or 12 below.

3. PRICE: Buyer shall pay to Company as the Purchase Price for the Apparatus the sum of Seven hundred fifty-six thousand four hundred fifteen U.S. Dollars (\$ 756,415.00)

This purchase price includes the following taxes: N/A

President of the City Council of
the City of Huntsville, Alabama
Date: _____

Any applicable taxes not specifically noted above will be paid by the Buyer directly, or will be added to the Purchase Price and paid by Company. If Buyer claims exemption from any tax, Buyer agrees to promptly furnish the applicable exemption certificate(s) and to indemnify and save Company harmless from any such tax, interest or penalty, which may at any time be assessed against Company as a result of this transaction.

4. TERMS OF PAYMENT: Terms of payment shall be:

- (A) Due upon signing..... \$ _____
- Due upon completion/receipt of chassis... \$ _____
- Due upon delivery.....\$ 756,415.00

(B) Check applicable method of payment for remaining balance due:

- Cash/cash equivalent at time of delivery
- Installment Sales Contract - Financing*
- Lease-Purchase Agreement - Financing*

* Lender/Leasing Company: _____

(C) No payment of any amount due under this Agreement shall be made directly to a KME Sales Representative without prior written approval from Company.

5. CONTINGENCIES: Company will not be liable for any delay, failure to make delivery, or other default due to strikes or labor unrest, war, riot, federal, state or local government action, fire, flood or other disaster or acts of God, accidents, breakdown of machinery, lack of or inability to obtain materials, parts or supplies, or any other causes or circumstances beyond the reasonable control of Company which prevent or hinder Company's manufacture and/or delivery of the Apparatus.

6. WARRANTY: Company provides a limited warranty on new Apparatus of its own manufacture in accordance with the warranty terms set forth in the Specifications.

EXCEPT TO THE EXTENT PROHIBITED BY LAW, COMPANY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF.

SEE SEPARATE WARRANTY STATEMENT(S) FOR COMPLETE INFORMATION.

7. DISCLAIMER OF CONSEQUENTIAL DAMAGES: COMPANY EXPRESSLY DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES WHICH MAY BE SUSTAINED BY BUYER, INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM THE USE, INABILITY TO USE, MAINTENANCE OR REPAIR OF THE APPARATUS, WHETHER UNDER THEORIES OF BREACH OF EXPRESS OR IMPLIED WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE.

8. CANCELLATION: This contract is not subject to cancellation by Buyer, unless for material breach by Company, except upon payment to Company of reasonable cancellation charges, which shall take into account expenses already incurred and commitments made by Company and Company's anticipated profit.

9. ENTIRE AGREEMENT; AMENDMENTS: This contract, including its appendices, embodies the entire understanding between the parties relating to the subject matter contained herein and merges all prior discussions and agreements between them. No agent or representative of Company has authority to make any representations, statements, warranties or agreements not herein expressed. All modifications or amendments of this contract, including the appendices, and Change Orders, must be in writing signed by an authorized representative of each of the parties hereto.

10. SEVERABILITY: If any provision hereof shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision, and this contract shall be construed as if the invalid, illegal or unenforceable provision had never been contained in it, unless to do so clearly negates the overall intent or purpose of the parties in entering into this contract.

11. CHANGES IN COMMERCIAL SPECIFICATIONS: Specifications for all commercial components of the Apparatus, manufactured by companies other than KME, are subject to change without notice. Specifications for such components will be as available at the time of manufacture of the Apparatus. Company shall not be liable for any specification deviations from the original contract specifications on such components made by their original manufacturer.

12. CHANGES IN REGULATIONS/INDUSTRY STANDARDS: The Purchase Price is subject to adjustment for changes to the Apparatus necessitated by changes in applicable government regulations (such as FMVSS or emissions regulations), industry standards (such as NFPA standards), replacement of discontinued models or components from vendors, or freight charges. Buyer is responsible for any cost increases due to such changes beyond Company's control.

EXPLANATION OF CONTRACT AMOUNT

BASE BID PRICE: \$756,315.00

OPTIONS:

The estimated value to scrap the existing chassis is \$3,000.00. This shall be provided as a contingency fund to be used at the discretion of the fire department.

A contingency fund in the amount of \$5,301.09 is included in the contract amount for the purchase and installation of an AVCOM 6-position headset system. The fire department shall provide the vendor information to the dealer prior to construction.

The City of Huntsville will be notified of any issues that may arise during the refurbish process. Any necessary changes will be issued a change order to be approved by the City of Huntsville. The City of Huntsville will be notified of any price changes that may arise as a result of changes in standards such as NFPA, EPA or any other regulatory agencies associated with the apparatus. Upon notification of the change and the pricing associated with the change, a change order will be executed by the Huntsville City Council.

FINAL CONTRACT PRICE WITH OPTIONS:

\$756,315.00

IN WITNESS WHEREOF, Buyer and Company have caused this Agreement to be executed by their duly authorized representatives this _____ day of _____, 201³ .

City of Huntsville

(Buyer's Legal Name)

By: _____
Signature

By: _____
Signature

Title: _____

Title: _____

By: _____
Signature

By: _____
Signature

Title: _____

Title: _____

Sales Representative: Doris Thrasher

Organization Name: NAFECO

By: _____
Signature

Title: Apparatus Sales Manager

This contract is not a valid and binding obligation until approved, dated and executed by Kovatch Mobile Equipment Corp., Nesquehoning, Pennsylvania.

ACCEPTED AND APPROVED BY KOVATCH MOBILE EQUIPMENT CORP.:

By: _____

Title: _____

Date: _____



QUOTATION

City of Huntsville Fire Rescue

Sales Rep: _____ **Terms:** _____

Drawing #: _____ **Penalty:** _____

Est. Delivery Date: / /

Customer PO #: _____

Customer #: _____

QPF #: _____

Exp. Date: 03/27/2013 **Create Date:** 02/25/2013 **Rev. Date:** 03/07/2013

Quote No: 10217-0018

03/11/2013 09:16:22

DESCRIPTION	
== REAR MOUNT PLATFORM - 1012.009 10/09/12 ==	
== LETTERING & STRIPING, 102' RM - 1012.009 10/09/12 ==	
== HD RM NO PUMP GEN/ELEC AC - 1012.009 10/09/12 ==	
== MISC AND LOOSE EQUIPMENT (AERIAL) - 1012.009 10/09/12 ==	
== SPECIAL, FACTORY USE ONLY!!! - 1012.009 10/09/12 ==	
== AERIAL WARRANTY PACKAGE W/PUMP - 1012.009 10/09/12 ==	
DEALER ===== DEALER ===== DEALER	
QUOTE DATA VERSION: 1012.009 - 2012 DATA SET	
INDEX OF PART NUMBERS	
**** HEADER - CONTRACTS, PROPOSAL FORM, ETC @ FRONT OF SPECS	
PROPOSED BY - NAFECO - AL - THRASHER	
**** PROPOSED - AERIAL SPEC BOILERPLATE	
PROPOSED - GENERAL INFORMATION - NFPA 1901	
PROPOSED - COMPLETION INFO	
PROPOSED - FMVSS CERTIFICATION	
PROPOSED - RECORDS	
PROPOSED - TOP OF THE LINE CHASSIS NON-MULTIPLEX	
PROPOSED - GENERAL CONSTRUCTION - AERIAL	
PROPOSED - SINGLE LINE RESPONSIBILITY	
PROPOSED - PRODUCT LIABILITY - \$30,000,000.00	
PROPOSED - PAINT PERFORMANCE CERTIFICATION	
PROPOSED SERVICE BY - NAFECO - THRASHER	
PROPOSED - PRICES & PAYMENTS	
PROPOSED - DELIVERY TIME	
PROPOSED - FAIR, ETHICAL AND LEGAL COMPETITION	
PROPOSED - NON-COLLUSION AGREEMENT	
PROPOSED - MATERIAL & WORKMANSHIP	
PROPOSED - SALES ENGINEER	
PROPOSED - APPROVAL DRAWING	
PROPOSED - INSPECTION VISITS (3)	
ACCOMMODATIONS FOR FOUR (4) FIRE DEPARTMENT PERSONNEL	
TRIP ONE (1) AT PRE CONSTRUCTION	
TRIP TWO (2) AT MID-POINT COMPLETION	
TRIP THREE (3) AT FINAL COMPLETION	
PROPOSED - GROUND TRANSPORTATION (LESS THAN 300 MILES)	
PROPOSED - DELIVERY, ACCEPTANCE AND TRAINING	
PROPOSED - INSTRUCTION MANUALS - CUSTOM CHASSIS - THREE (3) SETS - PAPER	
PROPOSED - "AS BUILT WIRING SCHEMATICS"	
PROPOSED - VEHICLE FLUIDS PLATE	

DESCRIPTION	
SEAT AND SEAT BELT ANCHOR TESTING DRIVERS SEAT, SEATS INC - AIR SUSPENSION, ABTS OFFICERS SEAT, SEATS INC - AIR SUSPENSION, SCBA FIXED BACK, 3 POINT BELT IMMI - SMARTDOCK- SCBA BOTTLE BRACKET - OFFICER'S SEAT - SEATS INC	
MFD CAB - REAR FACING SEATS INC SEATS - NON ROLLTEK	
SEATS INC 911 SCBA ABTS REAR FACING, OUTBOARD, DS IMMI - SMARTDOCK- SCBA BOTTLE BRACKET - OUTBOARD DS - SEATS INC SEATS INC 911 SCBA ABTS REAR FACING, OUTBOARD, OS IMMI - SMARTDOCK- SCBA BOTTLE BRACKET - OUTBOARD OS - SEATS INC	
MFD CAB - FORWARD FACING SEATS INC SEATS - NON ROLLTEK	
\$\$\$\$ (2) FORWARD SEATS - UPGRADE SEAT RISER IF (4) ARE NEEDED \$\$\$\$ 2 - SEATS INC 911 SCBA ABTS FORWARD FACING, CENTER STANDARD SEAT, FORWARD FACING, (2) CENTER IMMI - SMARTDOCK- SCBA BOTTLE BRACKET - 2 CENTER FORWARD - SEATS INC CENTER OPEN COMPT. SEAT BASE - BOLT IN - MFD, XMFD SEATS INC SEATING MATERIAL - TURNOUT TUFF GRAY SEATS INC PADDED SCBA OPENING COVERS	
**** HEADER - VEHICLE DATA RECORDER SYSTEMS	
FRC SEAT BELT WARNING SYSTEM - UP TO 13 SEATS FOUR (4) SEATING POSITIONS HELMET HOLDERS - IN CAB - REAL WHEELS RW607-1RT FRC #130 VEHICLE DATA RECORDER W/ LATERAL G - WIRELESS & HANDHELD COMPARTMENT DOOR AND EQUIPMENT MONITOR	
**** HEADER - CAB INTERIOR ACCESSORIES & OPTIONS, 100" PREDATOR	
PAINTED CAB EMS COMPARTMENT REAR OF ENGINE ENCLOSURE ADJUSTABLE SHELVES(S) FOR EMS STORAGE COMP CAB EMS COMPARTMENT LIGHTING, ROM V3 TRACK, LED STORAGE COMP FOR (4) 1-1/2" BINDERS (FRONT LOAD, HORZ)	
**** HEADER - INSTRUMENTATION & CONTROLS, 100" PREDATOR	
DASH & CENTER CONSOLE - 100" PREDATOR (ABS VINYL) INSTRUMENT PANEL, 100" PREDATOR INTER AXLE LOCK CONTROL SWITCH DIESEL EXHAUST FLUID LEVEL GAUGE INDICATOR CLUSTER, 100" PREDATOR "INTER AXLE LOCK" INDICATOR CLUSTER "ATC DISABLED" INDICATOR CLUSTER "ATC ACTIVE" INDICATOR CLUSTER "RETARDER ACTIVE" INDICATOR CLUSTER "RETARDER ON" INDICATOR CLUSTER "OUTRIGGERS NOT STOWED" INDICATOR ON DASH "LOW COOLANT LIGHT AND ALARM" INDICATOR !!!! NO CENTER DASH SWITCH PANEL EXTENSION/MODULE PROVIDED !!!! LOWER LEFT AUXILIARY SWITCH PANEL PUMP SHIFT CONTROL ON LOWER LEFT DASH PANEL AERIAL LADDER, LADDER POWER/PTO SWITCHES IN CAB FLAT DASH IN FRONT OF OFFICER (ABS), 100" PREDATOR SLIDING COMPUTER MOUNT IN FRONT OF OFFICER OVERHEAD ABS PANEL, FLAT FACED, 100" PREDATOR 2010 - RM HEATER/ DEFROSTER & ACCESS, PREDATOR NOTCH - 3" IN FRONT CLIMATE CONTROL SYSTEM - CONTROLS ABOVE DRIVER CAB TILT SYSTEM & OPTIONS AUXILIARY - MANUAL CAB LIFT BACK UP SYSTEM PARKING BRAKE/CAB TILT INTERLOCK	
FRAME & AXLE PACKAGE, TANDEM AXLE CHASSIS (HEAVY)	
110,000 PSI FRAME: AERIAL CHASSIS TRIPLE FRAME	
HEADER - FRONT BUMPER, EXTENSIONS & ACCESSORIES	
BUMPER 10" STAINLESS STEEL CONTOUR - ALL CABS \$\$\$\$ REQ 16" EXT MIN, MECH SIREN ON TOP BUMPER, D/O \$\$\$\$ 12" FRONT BUMPER EXTENSION WITH TREAD PLATE GRAVEL SHIELD TREADPLATE GRAVEL SHIELD STANDARD INSTALLATION TWO (2) PAINTED TOW HOOKS BELOW FRONT BUMPER AERIAL TRAVEL SUPPORT FOR ANY REAR MOUNT TYPE AERIAL 24,000# FRONT AXLE DANA I-220W DANA "S" CAM BRAKES 16.5" x 7", FRONT AXLE, WITH AUTO SLACK ADJUST SUSPENSION FRONT - 24,000# AXLES	

DESCRIPTION

FRONT AXLE SHOCK ABSORBERS - MONROE "MAGNUM - 70"

60,000# TANDEM REAR AXLE MERITOR RT-58-185

16.5" X 7" S-CAM BRAKES - MERITOR REAR TAN, W/AUTO SLACK ADJUS

VEHICLE TOP SPEED - 2009 NFPA STATEMENT

CHAIN SYSTEM FOR TANDEM AXLE (INSTA-CHAIN)

HENDRICKSON FIREMAAX, FMX-622 AIR RIDE- TA 62,000#

****** HEADER - BRAKE SYSTEM, TANDEM AXLE VEHICLE**

BRAKE SYSTEM, TA CHASSIS

ABS BRAKING FOR TANDEM REAR AXLE CHASSIS

AUTO TRACTION CONTROL (ATC) FOR ABS SYSTEM TANDEM REAR AXLE

ELECTRONIC STABILITY CONTROL (ESC) WITH (ATC) - CUSTOM TA

AIR RESERVOIRS 7100 CU IN TA, BASE

AUTOMATIC MOISTURE EJECTORS (ON ALL TANKS)

HEATED AUTOMATIC MOISTURE EJECTORS ON ALL TANKS

1/4 TURN DRAIN VALVES ON ALL AIR TANKS

BENDIX #AD-9, AIR DRYER HEATED

COLOR CODED SYNIFLEX BRAKE LINES - TA

AIR COMPRESSOR -WABCO 18.7 CFM- STD. FOR ALL CUMMINS ENGINES

BRAKE TREADLE VALVE

PARKING BRAKE CONTROL - NEAR DRIVER - ALL WHEEL LOCK

AUX. AIR INLET IN LH DOOR AREA (TO CHARGE VEHICLE AIR SYSTEM

VEHICLE AIR DISCHARGE CONNECTION IN LEFT DOOR AREA

50' AIR SUPPLY HOSE FOR AIR OUTLET ON CAB W/M

HEADER, TIRE AND WHEEL OPTIONS**HEADER, TIRES & WHEELS, 24,000 FRONT AXLE - ALUMINUM**

FRONT WHEELS, POLISHED ALUMINUM, 22.5 X 13, 24,390#

FRONT WHEELS, LUG AND HUB TRIM (ALUM WHEELS)

FRONT, GOODYEAR 425/65R22.5 L 24,400# G296 MSA MIXED - 68MPH

GOODYEAR - FIRE SERVICE RATING - TIRE RESTRICTIONS

HEADER, TIRES & WHEELS, 60,000 TANDEM REAR AXLE

REAR WHEELS, POLISHED ALUMINUM, 22.5 X 9, TA

REAR WHEELS, LUG AND HUB TRIM, TA (ALUMINUM)

REAR, GDYR 315/80R22.5 L 66,160# G287-MSA HIGHWAY - 68MPH, TA

GOODYEAR - FIRE SERVICE RATING - TIRE RESTRICTIONS

TIRE PRESSURE MONITORING - LED VALVE STEM CAPS - TEN TIRES

100" - ENGINE PACKAGE, HEAVY TANDEM AXLE CHASSIS****** 100" - HEADER, ENGINE & ENGINE COMPONENTS**

(10) CUMMINS ISX12 - 500 HP @ 1800 RPM TQ 1645 lb-ft @ 1200

ENGINE BASE WARRANTY, CUMMINS ENGINES

PROPOSED - ENGINE CERTIFICATION CUSTOM CHASSIS

COOLING/RADIATOR, 100" PREDATOR CAB/CHASSIS

ENGINE COOLANT FILTER - CUMMINS ISC - ISX

COOLING SYSTEM CRITERIA

TRANSMISSION COOLER

RADIATOR SKID PLATE

CHARGED AIR COOLER (STACK MOUNT), 100" PREDATOR CAB

COOLANT FAN, W/CLUTCH - CUMMINS ISX12

SILICONE HEATER AND COOLANT HOSE

LOW COOLANT INDICATOR LIGHT AND ALARM IN CAB

FAST IDLE ON DASH FOR ALL ELECTRONIC ENGINES - NON SMART WHEEL

ENGINE AIR CLEANER

SPARK ARRESTOR

ACCELERATOR PEDAL - FLOOR MOUNT

REMOTE THROTTLE & INTERLOCK HARNESS

ALLISON 4000EVSr TRANS. W/ OUTPUT RETARDER

FIVE (5) SPEED AUTOMATIC TRANSMISSION - 4000 SERIES

ALLISON TRANSMISSIONS, ELECTRONIC TOUCH PAD SHIFTER IN CAB

TRANSMISSION OIL LEVEL SENSOR

ALLISON PARK TO NEUTRAL

RETARDER OPERATION W/BRAKE PEDAL

TES 295 SYNTHETIC TRANS FLUID 4000EVS TRANSMISSION

DRIVE LINES DANA-SPICER #1810 SERIES

DIESEL EXHAUST FLUID TANK

EXHAUST SYSTEM - DPF & SCR SYSTEM - INLINE SYSTEM

STAINLESS STEEL EXHAUST TAILPIPE/OUTLET OS - DPF + SCR SYSTEM

DESCRIPTION

FUEL SYSTEM
 FUEL TANK - 65 GALLON, STEEL
 FUEL LINES - BRAIDED STEEL HOSE
 FUEL LINE SHUT-OFF VALVE
 CUMMINS FUEL-WATER SEPARATOR
 FUEL PUMP SECONDARY ELECTRIC, REQ. ON 210" W-B OR LONGER
 FUEL POCKET, LEFT SIDE REAR WHEEL WELL PANEL
 STEERING - DUAL SHEPPARD POWER STEERING GEARS
 STEERING COLUMN - BASE
 18" STEERING WHEEL
 \$\$\$\$ MUST DELETE 4FRONT - 3 POINT OFFICER SEAT BELT SELECTED \$\$\$\$
 DELETE - 4FRONT - FRONTAL AIR BAG PROTECTION SYSTEM IN STEERING WHEEL
 ROAD SAFETY KITS

**** HEADER, RM PLATFORM CHASSIS ELECTRICAL, 100" PREDATOR (OPTIONS)

**** HEADER, RM PLATFORM W/ PUMP BODY ELECTRICAL (OPTIONS)

PREDATOR CHASSIS ELECTRICAL SYSTEM DESCRIPTION
 PREDATOR CHASSIS WIRING INSTALLATION
 DIRECT BATTERY GROUNDING STRAP - PREDATOR
 EMI/RFI PROTECTION
 PREDATOR 12 VOLT ELECTRICAL SYSTEM TESTING
 LOAD MANAGED ELECTRICAL SYSTEM - 100" PREDATOR
 CHASSIS DIAGNOSTICS SYSTEM
 ADVANCED CHASSIS DIAGNOSTICS
 CUMMINS INSITE, ENGINE DIAGNOSTIC SOFTWARE
 VOLTAGE MONITORING SYSTEM
 INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM
 SEQUENCER
 ELECTRICAL HARNESS INSTALLATION
 LEECE NEVILLE 320 AMP 4962PA - ALTERNATOR
 BATTERIES - SIX (6) EXIDE GROUP 31, 1000CCA
 PREDATOR BATTERY STORAGE, STEEL, MFD, XMFD, LFD, XLFD
 BATTERY BOX COVER
 BATTERY DISCONNECT SWITCH, ALL UNITS
 COLE HERSEE BATTERY JUMPER STUDS, DS BATTERY BOX
 120 VOLT 20 AMP SUPER AUTO EJECT FOR BATT CHARGER - CUSTOM
 SHORELINE RECEPTACLE LABEL - NFPA
 RED COVER FOR KUSSMAUL AUTO-EJECT RECEPTACLE, #091-55RD
 SHORELINE LOCATION - ADJACENT TO DRIVER'S DOOR
 KUSSMAUL MODEL 1200, 40AMP W/ 12 VDC 100PSI AIR COMP.
 PREDATOR SWITCH CONSOLE CENTER OF DASH - NON MULTIPLEX
 TRUCK-LITE LED DOME LIGHTS
 INNER CAB DOOR FLASHERS (LED) TRUCK-LITE MODEL SUPER 44
 SUNNEX MODEL #700, GOOSE NECK MAP LIGHT AT RIGHT SIDE OF DASH
 COLLINS #CD-PULS750 PULSAR 750 HANDLIGHT ON DASH
 DOOR OPEN INDICATOR W/ INTEGRAL AUDIBLE ALARM
 12 VOLT POWER AND GROUND CIRCUIT FOR ACCESSORIES IN DASH
 12 VOLT POWER AND GROUND CIRCUIT, IN EMS COMPARTMENT
 REAR VIEW CAMERA SYSTEM
 COMMUNICATIONS EQUIPMENT INSTALLATION
 DUAL HEADLIGHTS, PREDATOR
 DAYTIME RUNNING LIGHTS, ALL CABS
 M6 LED TURN ABOVE HEADLIGHTS w/WHELEN M6 LED
 CUST RM PLATFORM CHASSIS LED MARKER LIGHTS
 CUST RM PLATFORM BODY LED MARKER LIGHTS
 FRONT WHEEL WELL DIRECTIONAL LIGHT
 TRUCK LITE LED MARKER LIGHTS @ TOP ROOF EDGE OF CAB RM PLAT
 TRUCK-LITE MARKER LIGHTS @ EA SIDE OF CAB, ADJACENT TO DRIVER DOOR
 TRUCK-LITE MARKER/TURN LIGHTS @ EA SIDE OF BODY
 TRUCK-LITE MARKER LIGHTS @ REAR OF BODY
 TRUCK-LITE DOT AMBER REFLECTORS @ SIDE OF BODY
 TRUCK-LITE DOT RED REFLECTORS @ REAR OF BODY
 WELDON LICENSE PLATE LIGHT @ DS REAR OF BODY
 WHELEN #M6 LED BRAKE, REVERSE, & TURN W/ QUAD HOUSING
 ZICO #ZQL-SS-H7614 QUIC-LIGHTS IN REAR WHEELWELL PANELS
 CAB STEP LIGHTS, TRUCKLITE LED, ALL DEVICES

DESCRIPTION

BODY STEP LIGHTS, WELDON HALOGEN, ALL DEVICES
 DUNNAGE AREA LIGHTING - TRUCKLITE LED
 UNITY HOSE BED LIGHTS, ALL DEVICES
 AERIAL ACCESS LADDER ILLUMINATION - WHELEN 3" LED - RM BODY
 FRC SPECTRA 900 LED SCENE LIGHTS BEHIND FRONT CAB DOORS
 FRC SPECTRA 900 LED SCENE LIGHTS ON REAR OF BODY
 CONTROL SWITCHES IN CAB FOR BEHIND FRONT CAB DOOR LIGHTS
 CONTROL SWITCH IN CAB FOR REAR OF BODY LIGHTS
 NFPA (4) TRUCK LITE LED GROUND LIGHTS, BELOW CAB DOORS
 GROUND LIGHTS, 2 LED BELOW PUMP PANEL RUNNING BOARD - TLL
 GROUND LIGHTS, 2 LED AT REAR BODY CORNERS - TLL
 FRC BROW LIGHT, SPECTRA LED, 215W12V, (2) FRONT DOOR RADIUS
 CONTROL SWITCHES IN CAB FOR LIGHTS AT FRONT DOOR RADIUS
 WIRE UPGRADE FOR 12V HIGH AMP LIGHTS - FRONT DOOR RADIUS
 AERIAL BODY ELECTRICAL SYSTEM
 AERIAL BODY ELECTRICAL JUNCTION COMPARTMENT
 REAR-MOUNT, AERIAL DEVICE ELECTRICAL JUNCTION COMPARTMENT
 PUMP ENCLOSURE WORK LIGHTS - TRUCK LITE SUPER 40 LED
 ENGINE COMPARTMENT WORK LIGHTS - TRUCK LITE SUPER 40 LED
COMPARTMENT LIGHTS - REAR MOUNT TANDEM AXLE
 COMPT. LIGHTS, ROM LED V3 TRACK LIGHTING - DUAL
 2-12 VOLT SPECTRA LED Q20 TELESCOPING W/POLES - REAR OF BODY
 CONTROL SWITCH IN CAB FOR REAR OF BODY LIGHTS
 WIRE UPGRADE FOR 12V HIGH AMP LIGHTS - REAR OF BODY TELE. LIGHTS
****** CUSTOM REAR MOUNT AERIAL NFPA WARNING LIGHT PACKAGE**
 NFPA COMPLIANT WARNING LIGHT PACKAGE - ALL UNITS
 LIGHT PACKAGE ACTUATION/CONTROLS - ALL UNITS
 WARNING LIGHT FLASH PATTERN - DEFAULT FROM MANUFACTURER
 WHELEN UPPER PACKAGE - CUSTOM REAR MOUNT AERIAL
 A-UPPER, WHELEN LED FNMINI, FREEDOM 24" PAIR
 C-UPPER, WHELEN LED L31 BEACON, RED
 B/D-UPPER REAR, COVERED BY LIGHTS IN ZONE C-UPPER
 B/D-UPPER FRONT, COVERED BY LIGHTS IN ZONE A-UPPER
 WHELEN LOWER PACKAGE - CUSTOM REAR MOUNT AERIAL
 A-LOWER FRONT, WHELEN M6 SUPER LED'S
 A-LOWER FRONT MOUNTING, CUSTOM CHASSIS
 C-LOWER REAR, WHELEN M6 SUPER LED'S
 B/D-LOWER FRONT, WHELEN M6 SUPER LED'S
 B/D-LOWER FRONT MOUNTING, CUSTOM CHASSIS
 B/D-LOWER MID, WHELEN M6 SUPER LED'S
 B/D-LOWER SECONDARY MID, WHELEN M6 SUPER LED'S
 B/D-LOWER REAR, WHELEN M6 SUPER LED'S
 LIGHT PACKAGE NFPA CERTIFICATION - ALL UNITS
 WHELEN 500 SERIES TIR-6 LED PAIR, MOUNTED AS DIRECTED
 WHELEN M6R SUPER LED PAIR, MOUNTED AS DIRECTED
 PAIR OF WHELEN 24" - "FNMINI" LED LIGHT BARS, SIDE FACING
****** HEADER, AUDIBLE WARNING & COMMUNICATION EQUIPMENT**
 CHASSIS SINGLE ELECTRIC (DOT) HORN
 HORN BUTTON - THREE WAY SWITCH
 CODE 3, #D450C, BACK-UP ALARM - 87DBA
 DUAL CHROME AIR HORNS
 DUAL AIR HORNS RECESSED IN FRONT BUMPER, STD
 AIR HORN CTRL - FOOT SWITCH FOR OFFICER & DRIVER
 SHUT-OFF VALVE FOR AIR HORN SUPPLY
 SIREN, WHELEN # 295HFS2, 200W - FLUSH MOUNT
 TWO (2) WHELEN SA122FMP SPEAKERS
 FEDERAL Q2B SIREN @ CAB FRONT
 Q2B MOUNT - LOCATED ON TOP OF DRIVER'S SIDE OF BUMPER
 SIREN CONTROL - FLOOR SWITCH, DRIVER AND OFFICER

Subtotal

 PRICING FOR REFURBISH--KME ROANOKE
****** HEADER, PUMP, TANK & ACC, 102' PLAT 3-SECT, RM, LO**
 WATEROUS CSU-C20-1500 SINGLE STAGE PUMP
 WATEROUS MECHANICAL PUMP SEAL
 WATEROUS "C20" PUMP DRIVE UNIT, ALL WATEROUS MID-SHIP PUMPS

DESCRIPTION	
PUMP RATIO (HALE, WATEROUS OR DARLEY) WATEROUS AIR SHIFT WATEROUS PUMP SHIFT INDICATOR LIGHTS TRANSMISSION LOCK-UP (HALE, WATEROUS OR DARLEY) PUMP MOUNTS - MID-SHIP PUMPS	
<p style="text-align: center;">**** HEADER, WATEROUS CSU, CMU, PRESSURE CONTROL</p> WATEROUS PRESSURE RELIEF VALVE SYSTEM (OPT)	
WATEROUS INTAKE RELIEF VALVE PUMP UL CERTIFICATION - 750 GPM & UP <p style="text-align: center;">WATEROUS, PUMP PRIMING PUMP AND CONTROLS</p>	
WATEROUS VPO OIL-LESS PRIMER WATEROUS PRIMER VALVE <p style="text-align: center;">WATEROUS, DRAINS & ACCESSORES</p>	
WATEROUS MASTER DRAIN VALVE DRAINS/BLEEDER "CLASS ONE" 1/4 TURN @ ALL 1-1/2" OR LARGER SYNIFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES WATEROUS ANODE BLOCKS - 2 TOTAL SIDE MOUNT PUMP MODULE, HD, RM AERIAL PUMP MODULE - STEEL CONSTRUCTION	
<p style="text-align: center;">**** HEADER, SUCTIONS - REARMOUNT TA-HD, SIDE MOUNT</p> WATEROUS MAIN SUCTION INLETS 6" NST, 1500 GPM CSU PUMP WATEROUS MANUAL MONARCH VALVE DS MAIN INLET SHORT NECK MAIN PUMP SUCTION INLETS - DS & OS 6" NST MAIN PUMP SUCTION PRESSURE VENTED CAPS (2) 6" NSTF X 5" STORZ KOCHER SKE-R 30° DEGREE ADAPTER W/CAP DS	
<p style="text-align: center;">HEADER - AUXILIARY SUCTIONS - AERIALS</p> 2 1/2" AUX. SIDE SUCTION @ DS PANEL TO REAR OF MAIN INLET 2 1/2" AKRON #8800 S.S. BALL VALVE, DS REAR AUX SUCTION SWING CONTROL @ VALVE, DS REAR AUX SUCTION BEHIND PANEL MOUNT	
<p style="text-align: center;">**** HEADER - TANK TO PUMP - HD REARMOUNTS</p> TANK TO PUMP 3" - LADDERS & PLATFORMS 3" AKRON #8800 SERIES - S.S. BALL, VALVE, TANK TO PUMP 3" PUSH/PULL CONTROL FOR TANK TO PUMP	
<p style="text-align: center;">**** HEADER - TANK FILL - HD REARMOUNT</p> TANK FILL LINE 2" FROM PUMP - SIDE MOUNT 2" AKRON #8800 SERIES - S.S. BALL TANK FILL, SIDE MOUN PUSH/PULL CONTROL FOR TANK FILL	
<p style="text-align: center;">**** DISCHARGES & ACCESSORIES, RM-TA-HD AERIAL - SIDE MOUNT</p> DELETE DS MAIN PUMP DISCHARGE #1 DELETE DS MAIN PUMP DISCHARGE #2 DELETE OS MAIN PUMP DISCHARGE #1 DELETE OS MAIN PUMP DISCHARGE #2 TFT "MONSOON RC" ELECTRIC DECK GUN TFT "MASTER STREAM" 1500 GPM ELECTRIC NOZZLE TFT PANEL MOUNT OPERATOR STATION DELETE - CROSSLAY #1 DISCHARGE DELETE - CROSSLAY #2 DISCHARGE	
<p style="text-align: center;">CROSSLAY & SPEEDLAY OPTIONS - RM AERIAL</p> STAINLESS STEEL ROLLERS - THREE CROSSLAYS BI-FOLDING TRIPLE OR QUADRUPLE CRSLY COVER, TRDPLT VINYL END FLAPS FOR ALUMINUM TRDPLT X-LAY COVER END FLAP COVER BLACK IN COLOR	
<p style="text-align: center;">WATERWAY DISCHARGE</p> AERIAL WATERWAY DISCHARGE - TA-HD AERIAL WATERWAY DISCHARGE, PLUMBING, 5" STAINLESS STEEL - RM 4" AKRON #8800 SERIES - S.S BALL, VALVE WATERWAY ELKHART HANDWHEEL GEAR VALVE CONTROL, WATERWAY FIRE RESEARCH FLOW/PRESS METER, INSIGHT ULTIMATE - WATERWAY	
<p style="text-align: center;">PUMP PANELS & ACCESSORIES</p> SIDE MOUNT PUMP PANEL - RM AERIAL SIDE MOUNT PANELS - 14 GAUGE BRUSHED STAINLESS STEEL VERTICALLY HINGED GAUGE PANEL - SIDE MOUNT OFFICER SIDE VERTICALLY HINGED PUMP ACCESS DOOR - SIDE MOUNT	

DESCRIPTION

PANEL FASTENERS

CAPS AND ADAPTERS SAFETY TETHER - BALL CHAIN
 PUMP PANEL DISCH./SUCTION TRIM PLATES, HIGH POLISHED
 DISCHARGE GAUGE TRIM BEZELS
 IDENTIFICATION PLATES
 PUMP OPERATOR'S PANEL LIGHT SHIELD
 GROTE LED LIGHTS - LIGHT SHIELD
 OS PUMP PANEL LIGHT SHIELD
 GROTE LED LIGHTS - LIGHT SHIELD

PUMP OPERATOR'S PANEL - SIDE MOUNT, AERIAL

RELIEF VALVE AND DRAINS @ PUMP PANEL
 AIR HORN CONTROL BUTTON ON PUMP PANEL
 5/8" PUMP BY-PASS COOLER ON PUMP PANEL
 FIRE RESEARCH "THROTTLE XCEL" THROTTLE CONTROL @ PANEL
 WATEROUS RELIEF VALVE CONTROL @ PANEL
 PUMP PRESSURE & VACUUM TEST PORTS @ PANEL
 MASTER PRESSURE & COMPOUND GAUGES - 4" NOMINAL GAUGES
 \$\$\$\$ CONSIDER DELETING MASTER GAUGES - IN GOVERNOR DISPLAY \$\$\$\$
 4 1/2" CLASS ONE MASTER PRESSURE AND COMPOUND GAUGES
 PRESSURE & COMPOUND GAUGE RANGES - SINGLE STAGE
 FIRE RESEARCH "THROTTLE XCEL"
 AUXILIARY ENGINE COOLER

WATER TANK LEVEL GAUGE - AERIAL

IC, SL ULTRA-BRIGHT 14 LIGHT LED WATER TANK GAUGE - PUMP
 IC WATER LEVEL - 1/4" NPT PRESS TRANSDUCER @ BOTTOM OF TANK
 \$\$\$\$ AERIAL DEVICE - REQUIRES SELECTION OF TOP MOUNT LEVEL SENSOR \$\$\$\$
 SLIDE-OUT STEP @ DRIVER'S PUMP OPERATOR'S PANEL
 **** HEADER, 95' & 102' REAR MOUNT PLATFORM, WATER TANK

WATER TANKS/OPTIONS AERIALS

UPF POLYIIE TANK - AERIAL
 TANK DESCRIPT, CONSTR AND MOUNT, UPF POLY IIE TANK
 BODY AND COMPARTMENT HEADER (ALL AERIAL DEVICES)
 GEN. 3/16" ALUM BODY DESCRIPT REAR MNT. PLATFORMS, HEAVY DUTY
 AERIAL DEVICE REFURBISHMENT
 REFURBISHMENT
CHASSIS DISPOSAL--\$3,000.00 CONTINGENCY TO BE USED AT FD DISCRETION
 REMOUNT

DOOR HINGE FOR BEVELED OVERLAPPING HINGED DOORS
 DOOR SEAL FOR BEVELED OVERLAPPING HINGED DOORS
 DOOR LATCHES FOR BEVELED OVERLAPPING HINGED DOORS
 KEYED DOOR LOCKS, HINGED OR ROLL-UP DOORS
 GAS SHOCK ON HORIZONTALLY & VERTICALLY HINGED DOORS
 COMPARTMENT TOPS
 DRIP MOLDING
 COATED FASTENERS
 TREAD PLATE OVERLAY, FRONT OF SIDE COMP'TS (NON-WRAP AROUND)
 POLISHED S.S. SCUFF PLATES, FULL HEIGHT OF REAR BODY CORNERS
 PAINTED REAR BODY PANEL, RM
 STAINLESS STEEL OUTRIGGER COVER PANEL, FOUR RIGGER DEVICES
 BODY RUB RAILS, C-CHANNEL
 RUNNING BOARD STEPS (AERIALS ONLY)
 REAR TURNTABLE ACCESS "A" FRAME LADDER FRAMEWORK -8 & -4
 REAR MOUNT, TURNTABLE A-FRAME LADDER STEPS (HD)
 REAR-MOUNTS, BODY HANDRAILS, EXTRUDED ALUMINUM, A-FRAME BODY
 (6) TRIDENT CHROME LIGHTED, FOLDING STEPS, FRONT OF BODY, (3) EA. SIDE
 ALUMINUM WHEEL WELL LINERS
 POLISHED ALUMINUM FENDERETTES, TANDEM AXLE BODIES
 REAR MUD FLAPS
 PAINTED REAR TOW EYES, BELOW BODY

HOSE BED COVER, VINYL WITH QTR TURNS

DESCRIPTION	
<p>HYPALON MATERIAL RED IN COLOR</p> <p style="text-align: center;">**** HEADER, HD RM NO PUMP 120/240 VOLT AC ELEC & GEN</p> <p>120/240 VOLT ELECTRICAL SYSTEM TESTING ONAN 10,000 WATT MOBILE PTO/HYDRAULIC GENERATOR ONAN HOT SHIFT PTO WARRANTY - ONAN PTO/HYD GENERATORS PTO GENERATOR CONTROLS @ PUMP PANEL GEN LOCATION TOP OF BODY -HD RM NO PUMP TWENTY (20) SPACE, 125 AMP MAIN LUG LOAD CENTER EIGHTEEN (18) STANDARD BREAKERS LOCATE BREAKER PANEL DRIVER SIDE FRONT COMPARTMENT 120 & 240 VOLT WIRING METHODS</p>	
<p style="text-align: center;">**** HEADER, RECEPTACLES - AERIAL NO PUMP</p> <p>NEMA L5-20 DUPLEX RECEPTACLES REAR BODY PANEL NEMA L5-20 DUPLEX RECEPTACLES MOUNTED AS DIRECTED BY F.D.</p>	
<p style="text-align: center;">**** HEADER, CORD REELS</p> <p>ONE (1) HANNAY #ECR-1620-17-18, 240 VOLT ELECTRIC CORD REEL CORD REEL LOCATION AS DIRECTED BY FIRE DEPARTMENT CIRCUIT BREAKER REQUIREMENTS FOR CORD REELS 200' OF 10/4 YELLOW CABLE FOR ONE (1) 240 VOLT REEL NEMA L14-20, 240 VOLT 20 AMP TWIST LOCK RECEPTACLE ON CABLE CIRCLE-D (20 TWIST) PF51GFCI-5P J-BOX W/ 220V PIGTAIL ROLLER ASSEMBLY FOR CABLE REEL, COST PER REEL BALL STOP ON END OF CABLE, PER REEL ALUMINUM TREAD PLATE JUNCTION BOX HOLDER, PER EACH</p>	
<p style="text-align: center;">**** HEADER, 102-RM-PL LO GROUND LADDERS</p> <p>CENTER LADDER STORAGE, 102-RM-PL ROLL-UP DOORS, LADDER COMPARTMENT, REAR MOUNT ONLY ALCO-LITE 115' LADDER COMP, 102-RM-PL ALCO-LITE PEL3-40 40' 3-SECTION EXTENSION LADDER (ALUM) ALCO-LITE PEL-35 35' 2-SECTION EXTENSION LADDER (ALUM) ALCO-LITE PEL-28 28' 2-SECTION EXTENSION LADDER (ALUM) ALCO-LITE PRL-20 20' ROOF LADDER W/FOLDING HOOKS (ALUM) ALCO-LITE PRL-16 16' ROOF LADDER W/FOLDING HOOKS (ALUM) ALCO-LITE AEL-14 14' ATTIC EXTENSION LADDER (ALUM) ALCO-LITE FL-10 10' FOLDING ATTIC LADDER (ALUM)</p>	
<p style="text-align: center;">**** HEADER, PIKE POLES & HOLDERS - AERIALS</p> <p>PIKE POLE TUBE(S) - AERIALS ADDITIONAL ITEMS SHIPPED WITH VEHICLE, ALL AERIAL DEVICES</p>	
<p style="text-align: center;">**** HEADER, LOOSE EQUIPMENT - AERIAL</p> <p>TWO (2) ZICO #SAC-44 FOLDING WHEEL CHOCKS, (2) MTD DRIVER SIDE</p>	
<p style="text-align: center;">**** HEADER, 102' PLATFORM, REAR MOUNT</p> <p>102' PLATFORM, REAR MOUNT HYDRAULIC SYSTEM PARKER HOSE KIT - 4 JACK UNIT REARMOUNT HYDRAULIC PUMP - PRESSURE COMPENSATED HYDRAULIC RESERVOIR - 67 GALLON HYDRAULIC OIL - REGULAR - A / W 46 DIVERTER VALVE, REAR MOUNT DEVICES OUTRIGGER HYDRAULIC CONTROL VALVE - RM, PROPORTIONAL ELECTRIC TURNTABLE HYDRAULIC CONTROL VALVE, RM PLATFORM HYDRAULIC SYSTEM FILTRATION REARMOUNT PLATFORM, "IQAN" MOTION CONTROL SYSTEM - ELECTRIC CONTROLS @ TT ELEVATION ANGLE OF LADDER - DISPLAY VERTICAL HEIGHT OF LADDER - DISPLAY DEGREE OF ROTATION FROM VEHICLE CENTERLINE - DISPLAY E-ZONE CAB & BODY AVOIDANCE WARNING - DISPLAY E-ZONE SHORT JACK WARNING - DISPLAY CRADLE ALIGNMENT MESSAGE - DISPLAY DEVICE LOAD MONITORING - DISPLAY E-SPEED LADDER TIP SPEED CONTROL - DISPLAY E-CUSH RAMP CONTROL FOR ELEVATION - DISPLAY E-CUSH RAMP CONTROL FOR EXTENSION & RETRACTION - DISPLAY WARNING MESSAGES - TURNTABLE & PLATFORM 102' PLATFORM, REAR MOUNT, EMERG HYD. PUMP, EPU HOT SHIFT PTO W/CONTROLS IN CAB</p>	

DESCRIPTION	
FAST IDLE CONTROL FOR ALL AERIAL DEVICES 102' PLATFORM, REAR MOUNT TORQUE BOX 102' PLATFORM, REAR MOUNT OUTRIGGERS AUXILIARY JACK PADS, FOUR (4) 24" X 24" X 1" POLY OUTRIGGER INTERLOCK SYSTEM & ALARM, ALL DEVICES	
**** HEADER - OUTRIGGER LIGHTING, FOUR (4) OUTRIGGERS	
TRUCK-LITE LED OUTRIGGER LAMPS, 4-OUTRIGGERS LED OUTRIGGER GROUND LIGHTS - TRUCK-LITE WHITELIGHT, 4-OUTRIGGERS	
OUTRIGGER SCOTCHLITE, RED/YELLOW CHEVRON OUTRIGGER FOOTPAD LASER INDICATOR/LOCATOR, 4-OUTRIGGERS 102' PLATFORM, REAR MOUNT, TETHER OUTRIGGER CONTROLS AUTO-LEVEL CONTROLS ON TETHER OUTRIGGER CONTROL "AUTO-LEVEL" HEAVY DUTY REAR MOUNTS ONLY OUTRIGGER LEVEL SIDE TO SIDE, ALL REAR MOUNT DEVICES 102' PLATFORM, REAR MOUNT, TURNTABLE TURNTABLE FEATURES, BOTTLE & DRIVE MOTOR MOUNT, ALL DEVICES STAINLESS STEEL CRADLE ALIGNMENT ARROWS ON TURNTABLE FIRE RESEARCH "MAN SAVER" BARS @ TURNTABLE OPENINGS 102' PLATFORM, REAR MOUNT, TURNTABLE SWIVEL IQAN - SWIVEL ROTATION ENCODER 102' PLATFORM, REAR MOUNT, ELEVATION SYSTEM LADDER INTERLOCK SYSTEM IQAN - INCLINOMETER IQAN - MOMENT LOAD INDICATOR IQAN - E-CUSH CONTROL, ELEVATION SYSTEM - PLATFORM & TURNTABLE IQAN LOAD METER TURNTABLE & PLATFORM 102' PLATFORM, REAR MOUNT, ROTATION SYSTEM ROTATION MOTOR AND BRAKE - 48" INTERNAL BEARINGS IQAN - "E-SPEED" SAFETY SYSTEM, PLATFORM & TURNTABLE IQAN - "E-ZONE" ROTATION SAFETY SYSTEM, 4-OUTRIGGERS IQAN - "E-ZONE" CAB & BODY PROXIMITY SYSTEM - PLATFORM & TURNTABLE IQAN - EXTENSION SYSTEM STRING POTENTIOMETER IQAN - "E-CUSH" EXTENSION/RETRACTION SYSTEM - PLATFORM & TURNTABLE LADDER SLIDE PADS, ALL DEVICES	
LADDER EXTENSION NUMBERS, ALL DEVICES	
LADDER LEVEL INDICATOR (BASE SECTION) - LIGHTED PLATFORM, CABLE/HOSE/WIRE ROUTING, 3-SECTIONS	
**** 2010 - REAR MOUNT PLATFORM CONSTRUCTION - OPTIONS ****	
PLATFORM DOORS, HINGED @ REAR, LATCHED @ FRONT SELF CLOSE PLATFORM, REAR ACCESS LADDER AND REAR GATE PLATFORM FLOOR PLATFORM MOUNT PLATFORM LEVELING SYSTEM PLATFORM BOTTOM HEAT SHIELDS, .09" TREAD PLATE PLATFORM EXT. HEAT SHIELDS, .09" PAINTED ALUMINUM PLATFORM SAFETY BELT LOOPS AND EXTERIOR LIFTING POINTS PLATFORM STRUCTURE PAINTED TO MATCH LADDER COLOR	
**** HEADER - PLATFORM 120 VOLT ELECTRICAL SYSTEM & ACCESSORIES	
PLAT, 120 VOLT ELECTRICAL SYSTEM PLAT, TWO (2) 120 VOLT NEMA 5-15R RECEPTACLES IN PLATFORM NO 120V LIGHTS REQUIRED ON REAR OF PLATFORM PLAT, FIRE RESEARCH RECESSED 155 WATT LIGHT FRONT OF PLATFORM FRONT OF PLATFORM LIGHTS SWITCHING, PLATFORM, TURNTABLE & CAB DASH PLAT, FIRE RESEARCH RECESSED 155 WATT LIGHT BOTTOM OF PLATFORM NO 120V LIGHTS REQUIRED ON SIDES OF PLATFORM	
**** HEADER - RM PLATFORM, 12 VOLT ELECTRICAL SYSTEM & ACCESSORIES	
HEEL PIN STEP LIGHTS - INNOVATIVE LIGHTING LED LIGHTS TURNTABLE CONSOLE STEP LIGHT - INNOVATIVE LIGHTING LED PLATFORM CONSOLE STEP LIGHT - INNOVATIVE LIGHTING LED TURNTABLE & PLATFORM CONTROL CONSOLE LIGHTING - LUMA BAR LED H2O LADDER LIGHTING - RED LUMA BAR LED H2O AMBER LED MARKER LIGHTS - PLATFORM	

DESCRIPTION

TWO (2) UNITY SPOTS @ LADDER BASE SECTION
 TWO (2) WHELEN PAR36 SUPER LED WORK LIGHTS @ PLATFORM
 RM PLATFORM WARNING LIGHTS, WHELEN M6 SUPER LED'S
 PLATFORM, CONTROL STATIONS
 RM PLATFORM, CONSOLE LOCATED @ LH SIDE OF TURNTABLE, STD
 102' PLATFORM, REAR MOUNT, TURNTABLE CONTROL STATION
 PLATFORM FRONT QUARTZ LIGHT SWITCH @ TURNTABLE CONSOLE
 FIRE RESEARCH INSIGHT ULTIMATE @ TURNTABLE CONSOLE
 TURNTABLE CONSOLE COVER - PAINTED RADIUS
 IQAN - MULIT-PLEX CONTROLLERS FOR PLATFORM
 PLATFORM CONTROL STATION, RIGHT REAR OF PLATFORM
 IQAN - MDM III DISPLAY @ PLATFORM CONTROL STATION
 102' PLATFORM, REAR MOUNT, PLATFORM CONTROL STATION
 PAINTED COVER FOR PLATFORM CONTROLLERS
 PLATFORM, FIRE RESEARCH 2-WAY COMMUNICATION SYSTEM - LOWER CONTROL
 PLATFORM, FIRE RESEARCH 2-WAY COMMUNICATION SYSTEM - UPPER SPEAKER/MIC
 LADDER ANGLE INDICATOR (FLY SECTION) - LIGHTED
 102' PLAT, REAR MOUNT, BREATHING AIR SYSTEM, 4500 PSI - 2B
 50' BREATHING AIR SYSTEM REFILL HOSE, ALL DEVICES W/AIR
 SCHRADER TYPE AIR COUPLINGS, ALL LOCATIONS, ALL DEVICES
 TWO (2) SCOTT AV-2000" 804386-19 MASKS, BREATHING AIR SYSTEM
 PLATFORM, TREAD PLATE AIR MASK STORAGE COMPT. ON PLATFORM
 IQAN - LOW AIR WARNING SYSTEM ALARM, PLATFORM
 102' PLATFORM, REAR MOUNT, WATERWAY SYSTEM
 102' PLATFORM, REAR MOUNT, WATERWAY
 5" HEEL PIN SWIVEL - S-PIPES, -10 TO 80 DEGREES
 AUTOMATIC WATER DRAIN/VENT
 ALL DEVICES, WATERWAY RELIEF VALVE
 REAR MOUNT AERIAL WATERWAY DRAIN, 1 1/2" VALVE
 4" NST REAR AERIAL WATERWAY INLET ADAPTER, REAR MOUNTS
 4" NSTF x 5" STORZ KOCHEK SKE-R 30° ADAPTER FOR REAR INLET
 CLASS ONE 2 1/2" GAUGE FOR AERIAL INLET, REAR MOUNTS
 102' RM PLATFORM, PLATFORM WATERWAY SYSTEM, SINGLE GUN
 SHOWER NOZZLE UNDER PLATFORM (ELECTRIC)
 PLATFORM MANUAL VALVE UNDER MONITOR - SINGLE
 TWO (2) 2-1/2" x 1-1/2" REDUCER FOR PLATFORM DISCHARGES
 PLATFORM, SINGLE AKRON #3570 MONITOR
 PLATFORM, DELETE MONITOR NOZZLE
 FIRE DEPT. AERIAL FAMILIARIZATION, THREE (3) DAYS
 FIRE DEPT. AERIAL FAMILIARIZATION, THREE (3) DAYS
 AERIAL SERVICE, ALL DEVICES
 WARNING DECALS, ALL DEVICES
 AERIAL LADDER, MANUALS, TWO (2) SETS
 102' PLATFORM, REAR MOUNT, PROOF LOAD TEST
 102' PLATFORM, REAR MOUNT, CERTIFICATION & TESTING

****** HEADER - PAINT SECTION - ALL UINTS ******

 GENERAL PAINT DESCRIPTION - ALL
 GENERAL PRIMER & PREP DESCRIPTION - LADDER/PLATFORM
 GENERAL FINISH PAINT DESCRIPTION - LADDER/PLATFORM
 BODY BUFFING & FINISH - LADDER/PLATFORM

****** HEADER - LADDER/PLATFORM BODY PAINT ******

 INSIDE/UNDERSIDE BODY PAINTED BLACK - LADDER/PLATFORM
 JOB COLOR COMPARTMENT INT W/SPATTER PAINT - LADDER/PLATFORM
 SINGLE COLOR BODY PAINT SCHEME - LADDER/PLATFORM
 PUMPHOUSE & PLUMBING PAINTED JOB COLOR - LADDER/PLATFORM

****** HEADER - TANDEM AXLE CUSTOM CHASSIS PAINT (AERIAL)**

 CUSTOM CAB PRIMER & PREP
 CUSTOM FINISH PAINT & PREP
 TWO TONE CUSTOM CAB PAINT SCHEME
 CUSTOM CAB BUFFING & FINISH
 CUSTOM CAB INTERIOR PAINT - TEXTURED GRAY
 CUSTOM CHASSIS GLOSS BLACK COLOR FRAME RAILS
 CUSTOM CHASSIS WHEEL AND HUB PAINT - TANDEM AXLE
 LADDER, PAINTING, ALL DEVICES, WHITE #91258
 TORQUEBOX PAINT - BLACK

DESCRIPTION	
OUTRIGER PAINT - SILVER URETHABOND 104	
LADDER RUST INHIBITOR - ALL DEVICES	
PAINT CODES, TWO-TONE COLORS, FILL IN BLANKS	
PAINT CODES, AERIAL DEVICE - WHITE #91528	
PINT OF TOUCH-UP PAINT	
FINALIZATION & DETAILING - LADDER/PLATFORM	
RUSTPROOFING WARRANTY, TEN (10) YEAR	
**** HEADER, LETTERING & STRIPING - 102-RM-PL	
COMPUTER GENERATED LETTERING	
SCOTCH-CAL W/ DROP SHADOW LETTERING ON FRONT CAB DOORS	
3" LETTERING ON LOCATION TBD	
SCOTCH-LITE W/O DROP SHADOW LETTERING ON LADDER HANDRAIL	
LETTERING FONT - BASIC BLOCK TYPE FONT	
CUSTOM FIRE DEPARTMENT LOGO	
SCOTCH-CAL W/ TWO COLORS - LOGO	
LOCATION - CUSTOM LOGO	
LARGE CUSTOM FIRE DEPARTMENT LOGO	
SCOTCH-CAL W/ TWO COLORS - LARGE LOGO	
LOCATION - LARGE CUSTOM LOGO	
CORNER SCROLLS - STYLE #1	
GOLD LEAF SCROLL MATERIAL	
19" X 144" LETTERING PANELS ON BASE SECTION	
SIGN PANELS TO PAINTED TO MATCH AERIAL DEVICE COLOR	
SCOTCH-CAL W/ DROP SHADOW LETTERING FOR AERIAL	
8" SCOTCH-LITE STRIPE ON CAB AND BODY - TA AERIAL	
WHITE SCOTCH-LITE	
8" SCOTCH-LITE "Z" IN STRIPE	
DUAL 3/4" SCOTCH-LITE ACCENT ON MAIN STRIPE	
BLACK PIN STRIPE ON TOP & BOTTOM OF MAIN STRIPE	
"STAY BACK 500 FEET" SIGN ON REAR OF BODY, ON MAIN STRIPE	
REAR CHEVRON STRIPING	
50% VERTICAL SURFACE	
6" REAR SCOTCH-LITE CHEVRON STRIPING	
RUBY RED & LEMON YELLOW SCOTCH-LITE	
**** PROPOSED - AERIAL WARRANTY PKG, W/PUMP @ REAR OF SPEC	
PROPOSED - 1 YEAR WARRANTY - BASE WITH CUSTOM CHASSIS	
PROPOSED - 5 YEAR CUMMINS BASE WARRANTY	
PROPOSED - 5 YEAR ALLISON EVS TRANSMISSION WARRANTY	
PROPOSED - LIFETIME FRAMERAIL WARRANTY	
PROPOSED - SHEPPARD STEERING GEAR STANDARD - THREE YEAR WARRANTY	
PROPOSED - 2 YEAR MERITOR - REAR AXLE WARRANTY	
PROPOSED - 5 YEAR DANA (EATON) FRONT AXLE - WARRANTY	
PROPOSED - 10 YEAR CAB STRUCTURAL WARRANTY	
BODY STRUCTURAL WARRANTY--REFURB	
BODY CORROSION WARRANTY	
REQ - 10 YEAR CAB CORROSION WARRANTY	
PROPOSED - PAINT FINISH WARRANTY, SEVEN (7) YEAR	
PROPOSED - REAR SUSPENSION - HENDRICKSOON AIR RIDE - TANDEM AXLE -THREE YEAR WA	
PROPOSED - SAFEGUARD TECHNOLOGY - 10 YEAR - RUNG COVERS	
AERIAL WARRANTY	
AERIAL WATERWAY	
PROPOSED - LIFETIME POLY/FIBERGLASS TANK WARRANTY - ALL TANK	
PUMP WARRANTY--WATEROUS REFURB	
PROPOSED - AKRON HEAVY DUTY VALVE - 1 YEAR WARRANTY ON REBUILT VALVES	
PROPOSED - BOSTROM SEATING 5 YEAR WARRANTY	
WHEEL ALIGNMENT	
****LOOSE EQUIPMENT TO BE PROVIDED BY DEALER****	
Total	756,415.00



KOVATCH MOBILE EQUIPMENT
ONE INDUSTRIAL COMPLEX
NESQUEHONING, PA 18201

CLARIFICATIONS AND EXCEPTIONS CITY OF HUNTSVILLE HUNTSVILLE FIRE RESCUE CUSTOM REAR MOUNT PLATFORM REFURBISH

Most specifications are almost entirely written by a manufacturer or dealer. This is an acceptable and widely used practice and without it the complication of writing specifications would be a great burden. KME does not utilize the exact same manufacturing techniques, designs, or materials as another manufacturing facility might. Since such is the case, certain items will not match those called for in your specifications. The dealer-supplied specifications will detail the exact manufacturing techniques to be performed.

Clarifications and Exceptions:

KME and NAFECO are very pleased to propose our KME Predator XL Custom Pumper which is the non-multiplex version of our top of the line cab, to meet the intent of the Huntsville Fire Rescue bid specifications. The proposed unit is priced and will be built to the KME proposal specifications to meet the intent of the bid specifications. All system designs, dimensions, and performances shall be as stated within the KME proposal specifications.

The following clarifications/exceptions apply to the unit, as proposed by KME Fire Apparatus. Items annotated with an (*) are being proposed as an equivalent to or exceed the item specified.

FRONT AXLE

(*) Due to the weight of the existing platform, a heavier front axle will be required. KME is providing a Dana I-220 W I-Beam front axle rated at 24,000 lbs.

FRONT SUSPENSION

(*) Front suspension shall be progressive rate front leaf springs—minimum 10 leaves, minimum 51” long and minimum 3 ½” wide with the capacity at ground being 24,000 lbs.

(*) The Dana axle is provided with a standard five (5) year parts and labor warranty. A copy of the warranty shall be provided.



STEERING

(*) A dual power steering system is provided which utilizes a Sheppard model #M110 main steering gear on the driver's side of the chassis and a Sheppard model #M90 steering gear on the officer's side.

FRONT BRAKES

(*) The Dana axle shall be provided with Bendix ES, Extended Service "S" Series, S-Cam 16.5" x 7" brakes. Brakes are fully air actuated with automatic slack adjusters.

ALCOA ALUMINIM WHEELS

(*) The front wheels shall be 22.5" x 13".

FRONT TIRES

(*) Front tires shall be Goodyear 425/65R22.5 G296 MSA Mixed on/off road tread rated at 24,400 lbs. @ 68 MPH.

REAR AXLE/SUSPENSION

(*) Rear suspension shall be Hendrickson "FIREMAXX" model #FMX-622 air ride suspension with a weight rating equal to the rear axle weight rating up to 62,000 lbs.

REAR BRAKES

(*) Rear brakes shall be 16.5" x 7" S-Cam, fully air actuated with automatic slack adjusters.

REAR TIRES

(*) Rear tires shall be Goodyear 315/80R22.50 G287 MSA highway tread rated at 66,160 lbs. @ 68 MPH.

RADIATOR

(*) The radiator and cooling system provided meets and/or exceeds NFPA and engine manufacturer's cooling system requirements. To provide maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed of long life aluminum alloy.

UREA STORAGE TANK

The DEF (diesel exhaust fluid) tank provided shall have a capacity of five (5) gallons. The tank shall be located in the battery box area with an access door in the crew step area.

REAR CREW AREA RAISE ROOF

(*) The cab shall have a 10" raised roof with a 52' wide notch for the aerial device. The forward roof area will be notched 3" lower than the roof over the driver and office and the rear raised roof will be notched a total of 13".

CAB FLOORS

Batteries will be mounted in fixed trays on each side of the chassis frame. An aluminum tread plate cover shall be provided to protect the batteries from road spray and road debris. The batteries may be accessed by tilting the cab. Access panels are not provided in the cab floor as specified.



REAR WALL

(* The rear wall of the cab shall be constructed of aluminum sheet material in lieu of specified aluminum tread plate turned to the outside. The fire department has the option to add an aluminum tread plate overlay on the exterior of the cab.

INNER DOOR PANELS

(* Upper door panels shall be formed ABS with an aluminum tread plate scuff plate.

BODY ELECTRICAL JUNCTION COMPARTMENT

(* The junction compartment shall be in its current location on the body to be refurbished.

EMERGENCY SWITCHES

(* Emergency switches shall be provided in the center console in lieu of specified overhead location.

PUMP

(* The pump specifications indicate a Hale pump. The existing Waterous pump and components shall be refurbished. The existing pump module shall be used and modified as needed. The refurbish shall include rebuilding the valves, replacing the control rods, suction inlets, etc. Details of the components to be refurbished are described within KME proposal specifications.

PUMP ACCESS PANELS

(* Due to the location of the compartment between the pump house and the cab, the pump access panels are not applicable as specified. The pump may be accessed from the compartment below the crosslays.

GAUGES

(* Specifications include both Class 1 and No Shok gauge descriptions. KME is providing Class 1 gauges. The fire department has the option to use No Shok gauges.

ENGINE GAUGES AND WARNING SYSTEM

(* The FRC ThrottleXcel is a throttle control and monitoring system. The specified engine gauge and warning system is not applicable when the ThrottleXcel system is utilized.

WATER TANK

(* The capacity of the water tank will be limited to the amount of space provided by the current body dimensions. The new water tank will be sized to hold the largest capacity of water possible to fit within the available space.

REFURBISHMENT

(* While other components of the aerial device will be sandblasted, the torque box will be cleaned and prepped for paint rather than sandblasting.

REAR "A" FRAME LADDER

(* Specifications indicate both an "A" frame ladder rear body and a flatback rear body. The "A" frame has the access ladder built into the rear body framework, while the flatback configuration provides a drop down staircase. Final design shall be determined at the pre-construction meeting.



ROTATION SYSTEM

(* The original bearing shall be tested prior to disassembly and utilized if within specifications. If the bearing is found not to be within specifications, it will be remanufactured. Option pricing shall be provided for both remanufacturing of the bearing as well as pricing for replacement.

PLATFORM FLOOR HEAT SHIELD

(* Due to the design of the Grumman ladder, the heat shield is not applicable as specified. The heat shield shall be provided on the floor of the platform in lieu of specified underside location.

PLATFORM COVERING

(* The current stainless steel panels on the platform will be replaced with painted aluminum. The bottom will remain aluminum tread plate.

STOKES BASKET RECEIVER

RAPPELLING ROPE GUIDES

ROOF LADDER MOUNT

PLATFORM 3-IN-1 BRACKETS

Due to the design of the Grumman ladder, adequate spacing is not available to provide the stokes basket receiver, rappelling rope guides, roof ladder mount and platform 3-in-1 brackets.

AERIAL CERTIFICATION

Upon completion of the aerial assembly, the apparatus will be tested as a new truck to meet NFPA 1901 as closely as possible. As this is a remount/refurbish, the refurbished apparatus will not fully comply with current NFPA standards.

TURNTABLE CONSOLE COVER

(* The turntable console cover specified is not applicable without changing the console. A flip-over style cover similar to the current cover will be provided and modified as needed to house the controls.

AERIAL APPARATUS CERTIFICATIONS (TYPE 1)

Testing as specified is not applicable with to refurbished apparatus.

APPROVAL DRAWINGS

(* Drawings of the proposed custom chassis shall be provided prior to construction.

LOOSE EQUIPMENT

The specified stainless steel and chrome Denver tool brackets are not available as specified. A leather blade bracket and restrainer shall be provided.







PROPOSAL
FOR
CITY OF HUNTSVILLE
HUNTSVILLE FIRE RESCUE

REFURBISH GRUMMAN AERIALCAT
PLATFORM

MARCH 5, 2013



PROPOSAL

NAFECO is pleased to offer the proposed vehicle to meet the intent of the fire department specifications. KME Fire Apparatus is a leading manufacturer in custom and commercial fire fighting vehicles.

Questions or concerns pertaining to this proposal can be answered by contacting the following KME representative:

Doris Thrasher
NAFECO
1515 West Moulton Street
Decatur, AL 35601

Phone: (800) 628-6233/(256) 353-7100
Fax: (256) 355-0852

E-mail: kmesales@nafeco.com
Web: www.nafeco.com

GENERAL INFORMATION

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

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

All items of these proposal specifications will conform to the National Fire Protection Association Pamphlet No. 1901, latest edition.

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

FIRE APPARATUS DOCUMENTATION

KME will supply, at the time of delivery, at least one (1) copy of the following documents:

The manufacturer's record of apparatus construction details, including the following information:

- Owners name and address
- Apparatus manufacturer, model and serial number
- Chassis make, model and serial number
- Front tire size and total rated capacity in pounds
- Rear tire size and total rated capacity in pounds
- Chassis weight distribution in pounds with water and manufacturer mounted equipment, front and rear
- Engine make, model, serial number, rated horsepower, rated speed and governed speed
- Type of fuels and fuel tank capacity
- Electrical system voltage and alternator output in amps.
- Battery make, model and total capacity in cold crank amps (CCA)

- Transmission make, model and serial number. If so equipped chassis transmission PTO(s) make, model and gear ratio
- Pump make, model, rated capacity in gallons per minute (liters per minute where applicable) and serial number
- Pump transmission make, model, serial number and gear ratio
- Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable) and serial number
- Water tank certified capacity in gallons or liters
- Paint manufacturer and paint number(s)

Certification of slip resistance of all stepping, standing and walking surfaces.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of suction capability.

If the apparatus has a fire pump or an industrial supply pump, a copy of the apparatus manufacturer's approval for stationary pumping applications.

If the apparatus has a fire pump or an industrial supply pump, the engine manufacturers certified brake horsepower curve for the engine furnished, showing the maximum governed speed.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturers certification of hydrostatic test.

If the apparatus has a fire pump or an industrial supply pump, the Underwriters Laboratory certification of inspection and test for the fire pump.

If the apparatus has an aerial device the Underwriters Laboratory certification of inspection and test for the aerial device.

If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911, Standards for Testing Fire Department Aerial Devices.

If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source.

If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation.

Weight documents from certified scale - showing actual loading on the front axle, rear axle(s) and overall vehicle (with the water tank full but without personnel, equipment and hose) will be supplied with the complete vehicle to determine compliance with NFPA-1901

Written load analysis and results of electrical performance tests.

If the apparatus is equipped with a water tank, the certification of water tank capacity by the tank manufacturer.

The proposed chassis will be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards (FMVSS) in effect at the date of contract. This will be attested to by the attachment of a FMVSS certify caution label on the vehicle by KME, who will be recognized as the responsible final manufacturer.



KME will be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the proposed apparatus. These records will be maintained in KME's factory for a minimum of twenty (20) years. The file will contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents. The purchaser will have access to any and all documents contained in this file upon official written request.

******THE HUNTSVILLE FIRE RESCUE GRUMMAN AERIALCAT PLATFORM SHALL BE REFURBISHED AND TESTED AS CLOSELY AS POSSIBLE TO NFPA 1901 STANDARDS. AS THIS IS AN EXISTING VEHICLE THAT WAS BUILT PRIOR TO CURRENT STANDARDS, THE VEHICLE WILL NOT MEET ALL CURRENT NFPA 1901 STANDARDS.******

"TOP OF THE LINE" CHASSIS

KME is proposing a custom built chassis, which is "Top Of The Line" including the cab structure and design, electrical system, drive train and frame assembly.

GENERAL CONSTRUCTION - AERIAL

The proposed apparatus, assemblies, subassemblies, component parts, etc., will be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is subjected to when placed in service. All parts of the apparatus will be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in firefighting service. All parts of the proposed apparatus will be strong enough to withstand general service under full load. The apparatus will be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair.

The apparatus will be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between front and rear axles that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters will be carried without overloading or injuring the apparatus.

The aerial ladder will be designed as a modular component of the apparatus. The aerial ladder, its support structure, and outrigger system will be designed to comprise an integrated assembly, removable from the carrier vehicle as a single self-supporting unit. The design will facilitate repair, modifications or replacement of the aerial device, apparatus body, or chassis individually, as required by wear from use, obsolescence, or for purposes of refurbishment.

SINGLE-LINE RESPONSIBILITY

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

PRODUCT LIABILITY INSURANCE

KME provides liability and facility insurance equaling \$30,000,000.00, which is one of the highest available in the fire industry. Reference attached documentation.



PAINT PERFORMANCE CERTIFICATION

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

SERVICE CENTER AND PARTS DEPOT

North America Fire Equipment Company Inc.
Fire Truck Service

KME FIRE APPARATUS SERVICE STATEMENT

The proposed KME Fire Apparatus vehicle is offered with service for in or out of warranty repairs can be promptly performed by the local KME authorized service center.

Service is provided by:

North America Fire Equipment Company Inc. (NAFECO)
1515 West Moulton Street
Decatur, AL 35601
Phone: (800) 628-6233/(256) 353-7100
Fax: (256) 353-7100
Contact: Brandon Oaks
Phone: 256 990 9029

Service Center Capabilities

North America Fire Equipment Company Inc. (NAFECO) celebrates over 40 years of operation and is proud to operate a Service Center in Decatur, AL. The family owned operation employs eight (8) full-time service mechanics to handle any service-related problems or improvements that you may desire.

North America Fire Equipment Company Inc. (NAFECO) is a Hale Master Parts and Service Center that operates five on the road service trucks that can offer In Station Service repairs to your apparatus if needed.

North America Fire Equipment Company Inc. (NAFECO) offers twenty-four (24) hour service in which assigned service personnel carry pagers; one (1) man is always on call to handle any truck that is down and out of service.

The service facilities provide service to handle sheet metal repair and fabrication, pump and electrical repair, aerial ladder service, and repair booster tank enlarging and replacement, and minor or major refurbishment capabilities.

Service and repairs to all makes of fire apparatus including trucks with Hale, Waterous, Darley, FMC and John Bean Pumps.

North America Fire Equipment Company Inc. (NAFECO) Service Center employees are fully insured with Workman's Compensation, at \$300,000.00 Garage Keepers Insurance Coverage and a 1 Million Dollar Products Liability Insurance Policy to protect your fire department in case of injury to personnel or your fire department equipment.



PRICES AND PAYMENTS

The bid price will be F.O.B. Destination, on a delivered and accepted basis at the Fire Department.

Total price on KME's proposal sheet will include all items listed in these specifications.

KME has computed pricing less federal and state taxes. It is understood that any applicable taxes will be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms.

DELIVERY TIME

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

Delivery Time: _____ Calendar Days

FAIR, ETHICAL AND LEGAL COMPETITION

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

NON-COLLUSIVE BIDDING CERTIFICATION

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

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

MATERIAL AND WORKMANSHIP

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

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

SALES ENGINEER

KME will designate an in house individual to perform KME's sales engineer functions. The sales engineer will provide a single point interface between the purchaser and KME on all matters concerning the contract.



APPROVAL DRAWING

A detailed drawing of the chassis will be provided to the City of Huntsville Fire Rescue for approval before construction begins. A copy of this drawing will also be provided to the manufacturer's representative. Upon City of Huntsville Fire Rescue approval, the finalized drawing will become a part of the total contract.

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

INSPECTION VISITS

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

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

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

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

The manufacturer will notify the buyer when the apparatus is completed and ready for final inspection. Final inspection shall be defined as the buyer inspecting all aspects of the prototype apparatus for compliance with specifications and quality of workmanship. Any items found to be deficient shall be corrected at that time. If the deficiencies are such that they cannot be corrected within 48 hours allotted for the inspection, another final inspection shall be required. The manufacturer shall notify the buyer when the deficiencies have been corrected so that an additional inspection trip may be scheduled. The cost of this and any other subsequent final inspection trips shall be paid by the manufacturer.

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

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

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

DELIVERY

Delivery of the apparatus to the Fire Department will remain the bidder's responsibility. The apparatus shall be delivered from the manufacturer to the buyer under its own power.

DELIVERY ENGINEER

A qualified and responsible representative of the contractor shall deliver the apparatus to the Fire Department and remain in the community purchasing the equipment for a sufficient time (normally three (3) days), to instruct the fire department personnel in the operation, care, and maintenance of the equipment delivered, and to mount small equipment items that were ordered with the apparatus.

FINAL ACCEPTANCE

Upon delivery, two (2) days must be allowed for the final acceptance inspection to be conducted by authorized representatives of HFR in the presence of the delivery engineer. In the event the apparatus fails to meet the test requirements on first trial, a second trial may be made within thirty (30) days of the date of the first trial. Housing of the apparatus will not constitute acceptance until testing is successfully completed. Upon successful acceptance, the payment will be made and training will begin.

TRAINING

The instruction provided to the purchaser shall be structured in a well organized classroom and hands on approach. The instructional objectives shall consist of the specification, operation, and maintenance of all components on the apparatus. At a minimum the covered objectives shall include instruction on the engine, transmission, regeneration, generator/inverter, battery charging system, fire pump, anti-lock brakes, electronic stability control, automatic traction control, transmission/engine retarder, ladder/stabilizer controls, and ladder operation. The training shall be concluded with a formal question and answer session which shall be videotaped for future apparatus training. Manufacturer shall provide electronic copies of all training materials including but not limited to all handouts and power point presentations to the purchaser for future training aids on the apparatus.

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

KME will supply at time of delivery, three (3) sets, paper copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual will contain the following:

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

"AS BUILT" WIRING SCHEMATICS

Complete "as-built" chassis wiring schematics for this apparatus will be supplied at the time of final inspection. All relays, solenoids and circuit breakers shall be permanently labeled. No exceptions, failure to meet these requirements will be grounds for refusal and will result in another final inspection trip at manufacturer's expense.



VEHICLE FLUIDS PLATE

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

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

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

KME OWNERSHIP

KME is a tightly held family owned corporation. All of the stockholders are members of the Kovatch family of Nesquehoning, PA. KME carries no (zero) long term debt and is the largest privately owned manufacturer of fire apparatus in the country.

PRIMARY PLANT CONSTRUCTION

In order to insure top quality construction, maximum assembly line and engineering communication and the highest level of manufacturing supervision the entire apparatus will be built at the bidders' primary (headquarters) manufacturing facility. Apparatus constructed at satellite plants will not be considered.

FAMA MEMBERSHIP

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

U.S.A. MANUFACTURER

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



QUALITY MANAGEMENT

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

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

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

A copy of KME's certificate is included in this proposal.

STEPPING, STANDING, & WALKING SURFACES

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

COOPERATIVE PURCHASING

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

LINE VOLTAGE ELECTRICAL SYSTEM CERTIFICATION

When the unit successfully meets all the requirements outlined in NFPA 1901, 2009 Edition, UL will issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with the required line voltage section of NFPA.

GENERAL APPARATUS DESCRIPTION "AERIAL"

The unit shall be designed to conform fully to the "Aerial Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 8 Aerial Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices

- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 19 Aerial Devices

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

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

CHASSIS DATA LABELS

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

Fluid Data

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

Chassis Data

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



Manufacturers weight certification:

- Gross Vehicle (or Combination) Weight Rating (GVWR or GCWR)
- Gross Axle Weight Rating, Front
- Gross Axle Weight Rating, Rear

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2009 NFPA Standard for Automotive Fire Apparatus.

****** CAB AND CHASSIS ******

"PREDATOR™" CAB TYPE

- FULL TILT
- CONTOUR WINDSHIELD

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

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

OPEN SPACE DESIGN

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

CAB MATERIAL - ALUMINUM

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

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

CAB - BASE CONSTRUCTION

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

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



CRASH TESTING CERTIFICATION

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

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

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

ROOF AND SIDE LOAD TESTING

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

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

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

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

DIMENSIONS - MEDIUM FOUR DOOR STYLE CAB

The cab shall be fully enclosed, capable of comfortably seating six (6) fire fighters in full firefighting turnout gear, cab over engine design, with integral tilt mechanism and engine access on top of doghouse.

Minimum Cab Dimensions:

- Overall width 100"
- Inside width across ceiling 92"
- Front area floor to ceiling 63"
- Top of front seat to ceiling 44" (depending upon seat type)
- Seat back to steering wheel 22" (depending upon seat type)
- Inside width (door to engine enclosure) 24" (driver's side, at floor)
- Inside width (door to engine enclosure) 20-1/2" (officer's side, at floor)
- Crew seat area width 92"
- Outer crew seat risers to rear wall 42"
- Centerline front axle to back of cab 62-1/2"
- Floor to top of engine enclosure 29.5"
- Centerline axle to front of cab 74"



Glass Area Dimensions:

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

Cab Entry Door Width Dimensions

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

Cab Entry Step Dimensions

- Forward door recessed step 30" wide x 9" deep
- Rear door recessed step 29" wide x 9" deep

Cab Entry Door Height Dimensions

- Forward door opening 74-1/4" high
- Rear door opening 84-1/4" high

CAB ROOF

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

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

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

Approximate dimensions:

- Crew area floor to ceiling 61 1/2"
- Top of crew seat to ceiling 45" (depending upon seat type)

NOTCHED ROOF

The 10" raised roof section over the crew area and center roof section over the forward seating area shall be notched for the aerial device. The forward roof shall be notched 3" lower than the roof over the driver and officer, the rear 10" raised roof shall be notched a total of 13". The notch shall be equipped with a chamfer on the bottom edge for interior headroom and comfort.

The raise roof notch shall be 52" wide to accommodate the aerial device.

CAB ROOF OVERLAY

A bright finish aluminum tread plate overlay shall be placed on the cab roof, starting at a point rearward of the light bar location and extending back to the end of the cab roof. This tread plate overlay shall be sealed with caulking around the edges to prevent moisture from entering the area between the cab roof and the overlay.

CAB DOORS

Four (4) side-opening doors shall be provided. The cab doors shall be totally aluminum construction with an extruded aluminum frame and a 3/16" thick aluminum outer door skin. Doors shall be full height from the step to the cab roof extrusion and enclose the step area when the doors are closed.

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

There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 2 1/2" wide reinforced rubber strap shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

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

Each of the rear entrance steps shall be a minimum of 8-1/2" deep. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each upper section of the steps and respective step risers shall be constructed as an integral part of the cab construction and shall be overlaid with bright finish aluminum tread plate. Each lower step shall be a bolt-in cast aluminum step.

DOOR LATCHES

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

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

Each exterior cab door shall be equipped with keyed locks. The cab doors shall be capable of being locked from the outside with a key and manually from the inside or with a momentary switch that shall either lock or unlock the doors. A switch shall be provided on both the driver and officer side of the cab dash.

ELECTRIC WINDOWS

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



All side cab doors shall be equipped with electrically operated windows.

The driver shall have a control to operate the officer's side window and the rear cab windows, in a panel located on the dash. The officer side window control shall be in a panel on the dash.

The control for each rear door shall be a rocker type automotive style switch located on the inside door panel within easy reach.

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

INNER DOOR PANELS

The upper section of each cab door interior shall have a formed ABS door panel, which shall be vacuum overlaid with a soft vinyl upholstery material. The color of the panel upholstery shall be gray. The ABS door panels shall terminate approximately ten (10) inches above the cab floor.

DOOR SCUFF PLATES

The lower and full width portion of each door interior shall have bright finish aluminum tread plate scuff plates to provide maximum wear protection. These plates shall extend above the inside cab floor level when the doors are closed.

A smooth aluminum panel shall be installed across the bottom of the door for installation of the NFPA required door striping (where applicable).

Each interior cab door panel shall be equipped with reflective ScotchLite material that shall cover at least 96 in².

CAB DOOR FRAME AND JAMB SCUFF PLATES

A polished stainless steel trim plate shall be provided rearward of each cab door opening to protect the vertical cab corner rearward of the door opening and on the cab door striker posts to protect the cab paint when exiting and entering the cab.

EXTERIOR CAB TRIM

A high luster stainless steel trim band shall be provided along the cab sides at 11.5" in height. Black vinyl trim molding shall be installed along the top and bottom of the trim band.

CAB SCUFF PANEL

A polished stainless steel scuff plate, approximately 2" x 2" shall be installed on the rear cab corners. The scuff plate shall extend the full height of the cab rear corner panel.

EXTERIOR CAB WALL OVERLAY

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

WINDSHIELD/GLASS

A two piece, symmetrical, safety glass windshield shall be provided on the cab for the driver and officer providing a clear viewing area. The windshields shall be full width to the center of the front cab support for each side and provide the occupants with a panoramic view. To provide enhanced peripheral vision on each side of the cab, the windshield and cab structure shall be designed with radius corners, which provide a minimum of 8" of glass area, measured from the glass face to the side edge near the door post. The windshield shall consist of three (3) layers; the outer light, the middle safety laminate and the inner light. The thick outer light layer shall provide superior chip resistance, the middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage and the inner light shall provide yet another chip resistant layer.

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

WINDSHIELD WIPERS AND WASHER

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

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

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

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

WINDSHIELD WIPER DURABILITY CERTIFICATION

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

CAB SIDE VIEWING WINDOWS

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

DARK TINTED REAR WINDOW GLASS

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

GRAB HANDLES

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

INTERIOR GRAB RAILS

Three (3) vertically mounted 12" black cast aluminum "D" style entry assist handles shall be installed, one (1) on the officer's side of the cab interior "A" post and one (1) on each side of the cab interior on the "C" post in the crew area to assist in entry and exiting of the cab.

FRONT CAB GRILL

There shall be a bright finished, custom formed grille assembly for maximum air flow to the charge air cooler and the radiator. The grille shall be designed with an aesthetic look, with large horizontal louvers that will be reinforced to provide integrity. The grill design shall match the thickness of the headlights to provide a streamlined, cohesive front trim package.

A mesh bug screen shall be provided behind the front grill assembly to protect the radiator from bugs and other debris. The screen shall be secured to the front of the cab, behind the main grill.

AIR INTAKE/OUTLET

Two (2) bright finished, custom formed air inlets/outlets shall be provided horizontally above the wheel well opening, one on each side of the cab. The grille shall be designed with an aesthetic look with horizontal louvers that will be equipped with a mesh screen to serve as a secondary ember separator. The side intakes shall be bolstered a minimum of 1" from the skin of the cab face. The design shall permit proper ducting of air through the engine compartment and cooling system.

ENGINE AIR INTAKE SYSTEM

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

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

WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion.

FENDERETTES

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

FRONT MUD FLAPS

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

CAB RADIUS MOUNTED MIRROR

Two (2) Ramco model 6001 FFHR-750HR polished aluminum, full face, heated, remote operated, 13 inches high X 9 3/4 wide mirrors, with a 750 top add-on heated / remote convex mirror, on a standard arm length of 15 inches shall be provided and installed. The flat glass and top mirror head shall be remote operated with a control switch mounted on the dash. The mirror head shall be attached to a polished aluminum arm mounted on the cab radius panel.

INTERIOR CAB TRIM

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

The forward overhead panel shall be covered with a three (3) piece custom formed ABS vinyl overlay, which shall have integrated windshield defroster/heat vents and four (4) comfort vents.

All ABS formed material panels, as well as all of the interior upholstery panels shall be medium gray in color. The upholstered cab overhead and side wall portions shall utilize gray Durawear upholstery with padding underneath to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

INTERIOR REAR WALL

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

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

UNDER SEAT STORAGE COMPARTMENTS

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

BARYFOL FLOORING

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

The material utilized for this application shall be certified to meet the NFPA 1901, 2009 revision for anti-slip walking surfaces.

CAB ACOUSTICAL INSULATION

One (1) inch thick acoustical insulation shall be provided on the cab roof and rear and side walls of the cab. This material shall be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a vinyl ABS material formed overlay to match the balance of the cab interior. To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from .250 5052-H32 aluminum, providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

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

SUN VISORS

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

******* CAB SEATING & ACCESSORIES *********SEAT BELT ANCHOR TESTING**

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

SEAT MOUNTING TESTING

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

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

DRIVERS SEAT

The driver's seat shall be a Seats Inc. Battalion 911 ABTS, Non SCBA with air suspension. A red 3-point integral seat belt with sensor and a 20 inch wide comfort cushion with EVC and occupancy sensor shall be provided as standard equipment.

The seat back have a 2-way adjustable lumbar support and a reclining frame; Towel bar adjustment of 3 inch rear and 4 3/4 inch forward and air suspension with a 3 inch height adjustment. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

OFFICERS SEAT

The officer's seat shall be a Seats Inc. 911 Universal High Back SCBA with Heavy Duty Ultra-Low air suspension. A 20 inch wide comfort cushion with EVC and occupancy sensor shall be provided as standard equipment.

The seat shall have a 2-way adjustable lumbar support and a fixed frame with towel bar adjustment of 2 inch rear and 2 inch forward and air suspension with a 3 inch height adjustment. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

A three point seatbelt system with dual retractors shall be installed.

The seat shall include a SmartDock Gen II bottle bracket.

REAR FACING, OUTBOARD, DRIVER SIDE SEAT

The seat shall be a Seats Inc. Battalion 911 ABTS, SCBA seat with a fixed base. A red 3-point RH shoulder harness with lap belt with sensor and 19 inch comfort cushion with EVC and occupancy sensor shall be provided as standard equipment.

The seat shall have an SCBA storage area, sculptured fit cushion back bolsters and flip away headrests.

The seat shall include a SmartDock Gen II bottle bracket.

REAR FACING, OUTBOARD, OFFICER SIDE SEAT

The seat shall be a Seats Inc. Battalion 911 ABTS, SCBA seat with a fixed base. A red 3-point shoulder harness with lap belt with sensor and 19 inch comfort cushion with EVC and occupancy sensor shall be provided as standard equipment.

The seat shall have SCBA storage, sculptured fit cushion back bolsters and flip away headrests.

The seat shall include a SmartDock Gen II bottle bracket.

CENTER FORWARD FACING CREW SEATS

Two (2) center inboard forward facing crew seat shall be a Seats Inc. Battalion 911 ABTS, SCBA with a fixed base. A red 3-point side to side interchangeable seat belt with sensor and 19 inch comfort cushion with EVC and occupancy sensor shall be provided as standard equipment.

The seats shall have SCBA storage, sculptured fit cushion back bolsters and flip away headrests.

The two (2) center inboard forward facing crew seats shall have standard seat.

The seat shall include a SmartDock Gen II bottle bracket.

FORWARD FACING CREW SEAT RISER

The center forward facing seats shall be mounted on a aluminum riser that shall be mounted in the center of the cab. The riser shall match the interior of the cab and shall have open compartments with no doors.

SEAT UPHOLSTERY MATERIAL

The seats shall be upholstered with Turnout Tuff gray material as provided by Seats Inc.

PADDED SCBA OPENING COVERS

Five (5) removable padded covers shall be provided for the SCBA seat openings.

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus shall be equipped with a FRC seat belt warning system. The system shall consist of a Seat Belt module, dash mounted display and an audible alarm.

Seat belt and seat cushion sensors shall be provided on the four (4) specified seating positions.

CAB HELMET STORAGE

Five (5) Real Wheels Corporation helmet retaining brackets #RW607-1RT shall be provided and installed in the cab. Mounting positions shall be determined at the pre-construction meeting.

VEHICLE DATA RECORDER

A Fire Research series SBA130-A00 seat monitor display and vehicle data recorder kit shall be installed. The kit shall include a seat monitor display module, a vehicle data recorder, a wireless interface, a lateral G sensor, a data collector, and cables.

The seat monitor display shall be programmable for up to thirteen (13) seats and have a seatbelt icon for each. A message display, push buttons for navigating through programs, vehicle system warning indicators, and a lateral acceleration indicator shall be located on the front of the seat monitor display.

The oldest data shall be erased first when memory capacity is reached. All data shall be password protected and upload-able from the vehicle data recorder.

The wireless interface shall allow the uploading of all data from the vehicle data recorder into a computer running FRC HAWK data management software.

The handheld data collector shall be able to upload data from the vehicle data recorders of multiple vehicles. The collected data shall be transferred into a computer running FRC HAWK data management software.

The HAWK software program shall store, manage, provide graphic displays, and produce formatted reports of the vehicle data.

Data storage capabilities shall include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- Seat belt monitoring (seat occupied with seat belt)
- Surface or panel mount
- VDR, date & time stamp
- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)
- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- Data interface for data download
- PC / Mac Compatible
- Hours Driven

- Data summary reports
- Last Minute Log
- Idle Time.

COMPARTMENT DOOR AND EQUIPMENT MONITOR

Fire Research WatchDog PRO model WDA21-A00 compartment door and equipment monitor shall be provided and installed with the FRC Seat Monitor and Data Acquisition system.

It shall have eighteen (18) single-wire input connections. When any input is low the WatchDog PRO monitor shall provide information to the FRC VDR to indicate that a hazardous condition exists, what the condition is by name, and the location.

INTERIOR CAB STORAGE COMPARTMENT

A storage compartment shall be mounted in the crew area at the rear of the engine enclosure. Final dimensions of the storage compartment shall be determined prior to construction.

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

One (1) adjustable shelf(s) shall be provided in the EMS compartment. The shelf(s) shall be constructed from 3/16" brush aluminum mounted to uni-strut tracking material.

The EMS compartment shall be equipped with two (2) ROM V3 brand LED interior track light(s). The lighting shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

MAP BOOK STORAGE

A map book compartment shall be provided for horizontal storage of four (4) 1-1/2" 3-ring binders, which shall be front loaded. The storage compartment shall be constructed from 1/8" aluminum which shall be painted with textured paint, matching the interior color of the cab.

******* CAB INSTRUMENTATION & CONTROLS *********DASH & CENTER CONSOLE**

The driver and officer side dash, along with the center dash, shall be covered with a custom formed ABS vinyl overlay to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

The dash gauge panel shall be a custom formed ABS pewter gray wrap-around design for improved visibility. A full complement of gauges shall be provided in custom formed bezels. The starter and ignition switches shall also be integrated into the upper left portion of the gauge panel for easier access.

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

The transmission gear selector and the spring brake control valve shall be located on an angled section of the center dash assembly toward the driver for easy access.

There shall be provisions for mounting a switch panel in the center of the dash between the driver and officer. The top center of the dash assembly shall contain one (1) removable panel to access the main chassis wiring circuits and breaker panels.

DRIVERS DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall be mechanically fastened to the main dash assembly. The dash panel shall be 1/8" aluminum with an anti-glare, pewter finish brushed surface. The driver's dashboard panel shall contain the gauge panel along with an instrument warning light cluster.

The main instrument panel shall contain the primary gauges. An ignition and engine start switch shall be located on main dash panel located in front of the driver.

Each gauge shall have a raised glass lens with polished chrome trim ring and be backlit by integral blue LED's. Each gauge shall be designed with an integral red warning light with a pre-programmed warning point. Gauges monitoring drive-train component status shall be of the direct data bus type capable of displaying information broadcast on the J 1939 data-link. Each gauge warning indicator shall be capable of activating an audible alarm inside the dashboard.

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

The primary gauges shall consist of:

- Vehicle speedometer (0-80 mph)
- Engine tachometer (0-3000 rpm)
- Engine oil pressure (0-100 psi); low oil pressure warning
- Engine coolant temperature (100-250 °F); high engine temp warning (based on engine)
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning at 11.8 amps
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low air pressure warning at 65 psi
- Fuel level (E-1/2-F); low fuel level warning @ 1/8 tank
- Air cleaner restriction gauge (0 - 40), warning at 25" restriction.
- Inter axle lock control switch
- Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank

INDICATOR CLUSTER

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

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

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

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

On the Road displays include:

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

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

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

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

- "Right And Left Directional" arrows (green in color)
- "Ignition ON" Indicator (amber in color)
- "Hi Beam" indicator (blue in color)
- "Battery ON" indicator (green in color)
- "Parking Brake ON" indicator (red in color)
- "Check Transmission" indicator (amber in color)
- "Cab Not Latched" indicator (red in color)
- "Stop Engine" indicator (red in color)
- "Check Engine" indicator (amber in color)
- "ABS Warning" indicator (red in color)
- "Low Coolant Level" (red in color)
- "Fuel Restriction" indicator (amber in color)
- "Water In Fuel" indicator (amber in color)
- "Fasten Seat Belts" indicator (red in color)
- "Fast Idle" Indicator (amber in color)
- "Do Not Move Truck" indicator (red in color)
- "DPF Regeneration" (amber in color)
- "Exhaust High Temperature" (amber in color)

- "Engine Diagnostic Fault" (amber in color)
- "Retarder On" (green in color)

Listed below are indicators that may be included, depending upon the vehicle configuration:

- "Wait To Start" indicator (amber in color)
- "Exhaust System Fault" (amber in color)
- "Topps System Fault" (amber in color)
- "Lube System Active" (amber in color)
- "Jacks Not Stowed" (red in color)
- "PTO Engaged" (green in color)
- "Inter Axle Lock" (amber in color)
- "4x4" (green in color)
- "Driver Controlled Diff Lock" (green in color)
- "Ok to Pump" (green in color)
- "Auto Traction Control" (amber in color)
- "Retarder Active" (amber in color)
- "Auxiliary Brake Active" (amber in color).
- "Inter Axle Lock" indicator
- "ATC Disabled" indicator (red in color)
- "ATC Active" indicator (yellow in color)
- "Retarder Active" indicator (yellow in color)
- "Retarder On" indicator (yellow in color)
- "Outrigger(s) Extended" indicator light
- "Low Engine Coolant" indicator light and alarm

LOWER LEFT AUXILIARY SWITCH PANEL

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

PUMP SHIFT CONTROL

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left panel. This control shall be equipped with a mechanical type lock to prevent inadvertent activation or de-activation. The lever positions and indicator light shall be clearly marked.

AERIAL POWER CONTROLS

There shall be an aerial device power and a PTO engagement switch located in the cab switch console. An aerial device PTO/hour meter shall be furnished adjacent to the power switches. See ladder description for details.

OFFICER DASH

There shall be a flat surface area in front of the officer for use with such items as a lap top computer.

COMPUTER MOUNT

A slide-out laptop computer mount shall be provided on the Data Terminal area in front of the officer's seat.

CENTER OVERHEAD PANEL

An overhead console with a removable pewter panel shall be provided on the cab interior overhead between the driver and officer to permit installation of cab stereo, intercom systems, arrow stick controls, etc. The overhead console shall be approximately 27" wide x 4" high x 13" deep and shall be integrated into the ABS overhead center panel. The overhead console shall not obstruct the driver's vision through the officer's side window.

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

CLIMATE CONTROL SYSTEM

A climate-control system shall be provided for total cab environmental comfort. This system shall provide heat, cooling and defrost capabilities to various areas in the cab. The system shall consist of a single evaporator unit, mounted in the center overhead of the cab.

The ceiling mounted evaporator/heater unit shall include the following:

- Heavy-duty, high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 3" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- A large center mounted multi-vent defroster louver positioned above the windshield to provide adequate airflow for windshield defrost.
- Four (4) integral 3" diameter louvers, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Damper controls shall be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers or the seat riser/floor outlets as required.
- An adjustable electric water valve to control the amount of heat.
- Housing shall be fully insulated and enclosed.
- BTU: 53,500 A/C
- BTU: 69,300 Heat
- CFM: 590 Heat
- CFM: 590 A/C.

The ceiling mounted evaporator unit shall be designed to include a deep well condensate collection pan, which shall include an automatic air vacuum pump to ensure proper drainage.

The ceiling mounted evaporator unit shall be enclosed with an ergonomically designed, custom panel to provide maximum headroom and a pleasing appearance.

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

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

All defrost/heating systems will be plumbed with one (1) seasonal shut-off valve mounted near the engine.

ROOF MOUNT CONDENSERS

Two (2) 12-volt, roof top, single condensers shall be mounted on the cab roof so as not to interfere with the aerial device or any emergency lighting systems. The condensers shall be designed with high performance, long life fan assemblies. The fan motors are to be equipped with sealed housings and shaft.

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

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

CLIMATE CONTROL SWITCHES

The drivers overhead panel shall contain all controls for the cab climate control system. The following controls shall be provided: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial. All controls shall be clearly labeled, adequately backlit, and installed in an easily removable panel.

CAB TILT ASSEMBLY

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

The cab tilt mechanism shall be custom designed for ease of maintenance and consist of two (2) hydraulic cylinders with a maximum lift capacity of 19,625 pounds. Hydraulic lines shall be rated at 20,000 PSI burst pressure. The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

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

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

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

AUXILIARY MANUAL CAB LIFT

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

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

CHASSIS FRAME ASSEMBLY

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

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Weldment type chassis and the use of Huck bolts shall never be used.

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from 110,000 PSI minimum yield steel, with a minimum section modulus of 17.97 cu in and a resisting bending moment (RBM) of 1,976,700 inch pounds.

A full length inner frame liner shall be installed. Total section modulus of each rail, with liner, shall be 31.20 cu in and the total resisting bending moment (RBM) shall be 3,432,000 in-lbs. per rail.

A third inner frame liner shall be provided between the front and rear axle spring hangers.

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

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

A 10" high by full width, two (2) ribbed, bright finish, stainless steel front bumper shall be provided. The bumper shall be wrap design to match the contour of the front cab sheet.

The bumper shall be extended 12" with a polished aluminum tread plate gravel shield enclosing the top and ends.

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

FRONT TOW HOOKS

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

AERIAL TRAVEL SUPPORT

An aerial travel support for the aerial device shall be provided and located as close to the front axle as possible.

FRONT AXLE

Front axle shall be a Dana I-220 W I beam type. Large diameter king pins and longer low friction bushings shall be provided to extend the service life of the kingpin knuckle joint.

The front axle shall be rated at 24,000 lbs.

FRONT BRAKES

Brakes shall be Bendix ES, Extended Service "S" series, S-Cam 16-1/2" x 7" and shall be full air actuated with automatic slack adjusters.

FRONT SUSPENSION

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

The front leaf springs shall have a minimum of 10 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground shall be 24,000 lbs. All springs shall be of center bolt design. All spring pins shall be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

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

REAR AXLE

Rear axle assembly shall be a tandem, Meritor RT-58-185 single reduction with a capacity of 60,000 lbs. Axles shall have a gear reduction as required.

A driver controlled inner axle lock for RT series axles shall be provided on the cab dash within easy reach of the driver.

Oil seals shall be provided as standard equipment.

REAR BRAKES

Brakes shall be "S" Cam, 16-1/2" x 7" size and shall be full air actuated with automatic slack adjusters.

REAR AXLE TOP SPEED

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

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

TIRE CHAINS

The vehicles rear drive axle shall be equipped with an Insta-Chain tire chain system. The system shall utilize the existing vehicle air compressor system. A switch shall be provided in the drivers console area to control the activation of the chains. The switch shall have a safety feature, which does not allow for inadvertent activation.

REAR SUSPENSION

A Hendrickson "FIREMAAX" model #FMX-622 air ride suspension shall be provided for the tandem rear axle. The suspension shall have a weight rating equal to the rear axle weight rating up to 62,000 pounds.

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

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

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

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

ABS SYSTEM

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

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

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

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



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

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

AUTOMATIC TRACTION CONTROL (ATC)

To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a standing stop. To do so an extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to ensure efficient acceleration. When the ATC system senses one of the rear wheels accelerating at a faster rate than the wheel on the other end of the same axle the brakes shall be applied to the faster wheel and the engine shall be powered down. The system shall be equipped with a dash-mounted light that shall come on when ATC is controlling drive wheel slip. The system shall also include an "off road traction" dash mounted switch that will allow the operator to momentarily allow controlled wheel slip before power down when the unit is in deep mud or snow.

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

ELECTRONIC STABILITY CONTROL (ESC)

Electronic Stability Control (4 or 6 Channel) shall be provided as part of the Standard ABS system. The Electronic Stability Control system shall be capable of recognizing and assisting in both rollover and vehicle-under and over-steer situations through advanced monitoring of vehicle parameters and automatic and selective application of the chassis brakes. The Electronic Stability system shall use lateral and yaw accelerometers, wheel speed sensors, ABS pressure modulator valves and an ECU to control the four corners of the vehicle. The controller shall monitor the vehicle response to turning and braking, and adjust or modulate the brake pressure at the wheel end to slow the vehicle in roll control, stabilize the vehicle when under or over steering, and modulate brake pressure when excessive wheel slip, or wheel lockup is detected. By these actions, the ESC system shall help to maintain vehicle lateral and roll stability, improve braking and steering during heavy brake applications and braking on slippery surfaces.

AUTOMATIC TRACTION CONTROL (ATC)

To further improve vehicle drive characteristics, the unit shall be fitted with automatic traction control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to ensure efficient acceleration. The system shall be equipped with a dash-mounted light indicating the ATC is controlling drive wheel slip. The system shall also include an "off road traction" dash mounted switch that will allow the operator to momentarily allow for more wheel slip when the unit is in deep mud or snow.

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

BRAKE AIR RESERVOIRS

There shall be a minimum of four (4) air reservoirs and be installed in conformance with best automotive practices.

One (1) isolated reservoir shall be provided with a capacity of 1738 cu. in. The reservoir shall be equipped with a valve that automatically closes when the ignition is turned off. This shall effectively protect the reservoir from any leaks in the air system.

Reservoir capacity total shall be a minimum of 7100 cu. in.

AUXILIARY AIR INLET

One (1) 1/4" "M" style brass quick release air inlet with male coupling shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall be located in the driver side lower step well of cab. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female coupling shall also be provided with the loose equipment.

This inlet shall allow a purchaser furnished external air supply to be connected to the chassis air system.

AIR DISCHARGE CONNECTION

A 1/4" "M" style quick disconnect air outlet with female connection shall be provided at the driver's side pump panel to allow the chassis air system to be utilized for a discharge air source.

AIR SUPPLY HOSE

A 50' section of air supply hose shall be provided with the vehicle to allow the fire department to utilize the air discharge on the cab. The hose shall be provided with a male and female "M" style coupling that shall match the coupling on the cab.

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 13" ten stud, hub piloted polished aluminum disc type.

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

The front tires shall be Goodyear 425/65R22.5 "20 Ply" tubeless radial G296 MSA on/off road tread. The tires shall be fire service rated up to 24,400 lbs. and shall have a top speed of 68 mph when inflated to 120 psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle will reduce its speed to no more than 50 mph after the first 50 miles of travel.

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

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

REAR WHEELS & TIRES

The tandem rear axle wheels shall be 22.5" x 9" ten stud, hub piloted polished aluminum disc type.

The tandem rear aluminum disc wheels shall be provided with bright nut covers and hub caps.

The rear tires shall be Goodyear 315/80R22.5 "20 Ply" tubeless radial G287-MSA highway tread. The tires shall be fire service rated up to 66,160lbs and shall have a top speed of 68 mph when inflated to 130psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle will reduce its speed to no more than 50 mph after the first 50 miles of travel.



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

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

TIRE PRESSURE MONITORING DEVICES

Each tire shall be equipped with an air pressure indicator cap on the valve stem. Each cap shall have a visual LED indicator to show if the tire is correctly inflated.

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

ENGINE

Engine shall be a Cummins, 2010 Model ISX12 500, diesel, turbo-charged, per the following specifications.

- Max. Horsepower 500 HP @ 1800 RPM
- Governed Speed 2100 RPM
- Peak Torque 1645 lb. ft. @ 1200 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore & Stroke 5.11 x 5.91 in.
- Displacement 729 cu. in.
- Compression Ratio 17.1:1
- Governor Type Limiting Speed
- Drive line Size 1810 Series.

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

A fuel/water separator shall be provided.

ENGINE BASE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

ENGINE CHASSIS CERTIFICATION

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

COOLING/RADIATOR

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

To provide maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy. The core shall be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes shall be brazed to aluminum headers. No solder joints or leaded material of any kind shall be acceptable in the core assembly.

The radiator core shall have a height of 35.92" x a width of 37.62". Supply and return tanks made of glass-reinforced nylon shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator shall be compatible with commercial antifreeze solutions.

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

The cooling system shall include a surge tank mounted to the top of the radiator framework that shall remove air in the system. The surge tank shall be equipped with a sight glass to monitor the level of coolant. The radiator shall be equipped with a dual seal cap that shall allow for expansion and recovery of coolant into a separate integral chamber.

The cooling system shall be designed for a maximum of fifteen (15) PSI operation.

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

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

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

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

TRANSMISSION COOLER

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

RADIATOR SKID PLATE

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

CHARGE AIR COOLER

The charge air cooler shall be constructed of aluminum with cast aluminum side tanks. To not restrict air flow to the radiator, the charge air cooler shall be designed to be an integral part of the radiator assembly, mounted directly on top of the radiator. Rubber isolators shall be used at the mounting points to reduce transmission of vibrations.

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

Charge air coolers that are located in front of the radiator, that block or restrict air flow into the engine radiator or introduce above ambient temperature air into the radiator in any way shall not be used.

COOLING SYSTEM FAN

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

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

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

COOLANT HOSE AND PIPING

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

HEATER HOSES

Heavy duty silicone heater hoses {will/shall} be furnished for the heater system. All heater hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

LOW COOLANT INDICATOR LIGHT AND ALARM

A low engine coolant indicator light located in the dash instrument panel shall be provided. An audible alarm shall be provided to warn of the low coolant condition.

ENGINE FAST IDLE

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

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

AIR CLEANER

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

SPARK ARRESTOR

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

ACCELERATOR CONTROL

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

REMOTE THROTTLE CONTROL HARNESS

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

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

ENGINE PROGRAMMING REMOTE THROTTLE

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

TRANSMISSION

An Allison World Transmission, Model 4000EVSR, electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

- Max. Gross Input Power 600 HP
- Max. Gross Input Torque 1850 lb. ft.
- Input Speed (Range) 1700- 2300 RPM
- Direct Gear (Pumping) 4th (Lock-up)

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

The transmission shall contain a built-in output retarder, controlled by an on/off switch on the dash, and actuated by utilizing the brake pedal.

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

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

- First 3.51:1
- Second 1.91:1
- Third 1.43:1
- Fourth 1.00:1
- Fifth 0.74:1
- Reverse -4.80:1

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

TRANSMISSION OIL LEVEL SENSOR

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

PARK TO NEUTRAL

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

RETARDER OPERATION W/BRAKE PEDAL

Retarder control shall be through a switch on the dash, with activation of the retarder in conjunction with the brakes via the brake pedal.

A temperature gauge and indicator light shall be provided for retarder monitoring.

Retarder programming shall be as follows: 1/3 activation upon accelerator release, and additional 1/3 activation at 7 PSI of brake application and the remaining 1/3 activation with 10 PSI of brake application.

A documented print out from transmission programming must be provided to verify the actual programming of the transmission retarder meets specifications.

SYNTHETIC TRANSMISSION FLUID

Castrol "TRANSYND" or an equivalent synthetic TES 295 transmission fluid shall be utilized to fill the 4000 EVS transmission.

DRIVE LINES

Drive lines shall be Dana (Spicer) 1810 heavy duty series or equal, with "glide coat" splines on all slip shafts. The chassis manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The manufacturer shall provide proof of compliance with all drive shaft manufacturer's standards and specifications.

DIESEL EXHAUST FLUID TANK

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

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

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

EXHAUST SYSTEM

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

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

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

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

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

SELECTIVE CATALYTIC REDUCTION (SCR)

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

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

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

****** FUEL SYSTEM ********FUEL TANK**

Fuel tank shall be a minimum of sixty-five (65) gallon capacity. It shall have a minimum fuel filler neck of 2" ID. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from hot rolled, pickled and oiled steel. Provisions for an additional feed line and fuel level float shall be provided for future use.

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

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

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

The fuel lines shall be wire braid reinforced fuel hose. The lines shall be carefully routed and secured along the inside of the frame rails.

A fuel line shut-off valve shall be provided between the fuel tank and the primary fuel filter.

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

FUEL FILTER/WATER SEPARATOR

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

SECONDARY ELECTRIC FUEL PUMP

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

FUEL POCKET

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

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

DUAL POWER STEERING

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

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

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

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

STEERING COLUMN

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

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

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

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

STEERING WHEEL

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

ROAD SAFETY KIT

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

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

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

CHASSIS ELECTRICAL SYSTEM

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

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

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

WIRING HARNESS DESCRIPTION

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

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

All harnesses will be securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations shall use a method that provides a positive mechanical and electrical connection and are in accordance with the device manufacturer's instructions. No connections within the harness may utilize wire nut, insulation displacement, or insulation piercing components.

All circuits shall conform to SAEJ1292. All circuits will be provided with low voltage over current protective devices. These devices shall be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers shall not be used for ground connections.

Laminated or vinyl overlaid schematics shall be provided and applied to the underside of the cab center dash access panel and inside the body junction compartment access panel.

DIRECT GROUNDING STRAPS

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

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

EMI/RFI PROTECTION

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

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

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

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

12 VOLT ELECTRICAL SYSTEM TESTING

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

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

TEST #1-RESERVE CAPACITY TEST

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

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

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

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

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

LOW VOLTAGE ALARM TEST

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

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

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

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

LOAD MANAGEMENT SYSTEM

A load management system shall be provided. The load manager shall have 16 programmable outputs to supply warning and load switching requirements. The load management system shall be capable of offering load sequencing, load shedding, fast idle control, low voltage warning, scene mode operation and response mode operation.

Outputs 1 thru 12 shall be independently programmable to activate during the scene mode, the response mode or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output 13 shall be designated to activate a fast idle system. Output 14 shall provide a low voltage warning for an isolated battery. Output 15 is a user configurable output and shall be programmable for activating between 10.5 and 15 volts. Output 16 shall provide a low voltage alarm that activates at the NFPA required 11.8 volts.

The load management shall have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode.

The load management shall also be protected against reverse polarity and shorted outputs, and be enclosed in a metal enclosure to enhance EMI/RFI protection.

CHASSIS DIAGNOSTICS SYSTEM

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

The diagnostic system shall include the following:

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

ADVANCED CHASSIS DIAGNOSTICS

A Nexiq USB Link Adapter shall be provided to interface between the chassis and a computer.

The following software shall be provided to allow technicians to view diagnostic data from the chassis components:

- Cummins Insite - Engine Diagnostic Software

VOLTAGE MONITOR SYSTEM

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

12 VOLT SEQUENCER

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

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

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

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

ELECTRICAL HARNESS REQUIREMENT

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

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - Heavy duty wiring systems for on-highway trucks
- NFPA 1901 - Standard for automotive fire apparatus
- FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses
- SAE J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A.

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

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

- All holes made in the roof shall be caulked with silicon. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.

- Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area shall have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas shall have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.
- Cab and crew cab harnessing shall not be routed through enclosed metal tubing. Dedicated wire routing channels shall be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab shall allow for easy routing of additional wiring and easy access to existing wiring.
- All standard wiring entering or exiting the cab shall be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

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

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

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

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

ALTERNATOR

The alternator shall be Leece Neville Model 4962PA, 320 amp, serpentine belt driven unit. The installation shall include an integral self-diagnostic regulator and rectifier for compact installation.

The alternator installation shall be designed to provide maximum output at engine idle speed to meet the minimum continuous electrical load of the apparatus as required.

BATTERY SYSTEM

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

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

BATTERY STORAGE

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

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

BATTERY BOX COVER

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

BATTERY DISCONNECT SWITCH

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

BATTERY JUMPER STUDS

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

120 VOLT SHORELINE CONNECTION - "SUPER" AUTO EJECT

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

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

SHORELINE POWER INLET PLATE

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

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

The Kussmaul auto-eject connection shall be equipped with a Red or other Department directed color weatherproof cover.

The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door.

BATTERY CHARGER / AIR COMPRESSOR SYSTEM

A Kussmaul model # 091-9-12V-1200, "Pump Plus 1200" air compressor/high output battery charger shall be provided for maintaining the vehicle's air / battery system. Unique electronic sensing circuits sense the true battery voltage while eliminating the need for external sense wires. Output current shall be 40 amperes @ 12 volt DC.

The air compressor shall maintain the air pressure in the chassis air brake system while the vehicle is not in use. The air compressor shall have a rated input at 12 volt DC @ 12 amps and a max output of 100psi.

An LED bar graph display shall be located near the shoreline connection to monitor the battery status.

EMERGENCY SWITCHES

A switch control console shall be provided in the center dash panel between the driver's and officer's position. This console shall separate the emergency / auxiliary electrical functions from the regular chassis functions. A minimum of ten (10) rocker type switches with integral indicator lights shall be provided, in addition to the Load Manager indicator.

A master warning switch shall be provided, which shall allow pre-setting of emergency light switches and shall have a red integral indicator light. Next to the master switch, a total of eight (8) load manageable emergency switches shall be provided. The last remaining switch shall be a ground light switch. All switches, (other than the master switch), shall have switch function labeling and an amber integral indicator light.

LIGHTING - CAB INTERIOR

Eight (8) LED dome lights shall be provided in the cab. The lights shall be Truck-Lite brand. Each dome light shall have an integral selector switch. Each dome light shall also activate when the respective, adjacent cab door is opened. Truck-Lite model #4404C and #44022R dome sealed LED lights with individual switches shall be installed in the cab as dome lights. Two (2) clear and two (2) red in the front cab and two (2) clear and two (2) red in the back of the cab. In addition, the dome lights shall be wired to the cab door switches. The dome lights shall also have a chrome mounting cover #44705.

INNER CAB DOOR LED FLASHERS

One (1) flush mounted Truck-Lite Model Super 44 LED flashing light, with integral flasher, shall be provided on the inside door panel of each cab door. The light shall be recessed into the door's lower scuff plate and shall be activated when the respective door is opened. Each light shall be furnished with a red lens.

CAB MAP LIGHT

A Sunnex model # 700 high intensity goose neck map light shall be furnished and located at the right side of the cab dash.

CAB SPOTLIGHT

One (1) Collins model # CD-PULS750, Pulsar 750,000 candlepower spot / 5,000 candlepower flood, hand held, spot/flood light shall be provided with a vehicle mounting bracket on the cab dash. A handle mounted, on/off rocker switch and a coil cord with up to nine (9) feet extension shall be furnished. The hand light shall be mounted at the right side of the center dash panel.

"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM

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

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

12 VOLT ACCESSORY CIRCUIT - CAB DASH

Two (2) plug-in type receptacles for hand held spotlights, cell phones, chargers, etc. shall be installed in the officer side dash. The receptacles shall be wired battery hot.

12 VOLT ACCESSORY CIRCUIT- CREW CAB AREA

Two (2) 12 volt 20 amp DC outlets with female twist lock shall be provided in the EMS compartment.

REAR VIEW CAMERA SYSTEM

A Pro-Vision TV-525 rear camera system shall be provided and installed to allow the driver to see at the rear of the apparatus while seated in the cab. The system shall be provided with a 7.0" LCD color monitor and one (1) VLBI Night Vision camera.

COMMUNICATIONS EQUIPMENT INSTALLATIONS

Some or all of the following equipment shall be provided to the manufacturer and shall be installed during the manufacturing process. It is anticipated that it will take approximately 4-6 weeks after award of bid for the arrival of equipment to Huntsville Fire & Rescue. It will then be provided to the designated manufacturer's representative.

The equipment to be installed shall be as follows:

700-800 Megahertz radio and antenna on the roof; Radio will be wired to the always hot side of the battery switch. Radio is a Motorola APX 6500. The radio will be supplied with 2 speakers, one mounted in the headliner in the front of the cab and the other to be mounted in the rear of the crew compartment.

A VHF radio with an antenna on roof; Radio will be wired to the always hot side of the battery switch. Radio is a Motorola CM300. This radio will use internal speaker.

4 vehicle radio battery charges will be supplied to be mounted in the crew compartment mounted according to Motorola instructions.

Computer mount and docking station and associated wiring in location to be determined by the department. DC computer power supply shall be wired to the hot side of the battery switch. A USB extension cable must be run from the docking station to a location on the front center post of the windshield near the top of the cab. HFR will coordinate with the manufacturer to determine the best type of docking station to supply to fit manufacturers recommended computer mount for the truck.

A VL unit wired to hot side of battery switch so that it is always on. This will include mounting antenna on roof and running coax cable to the unit. Also included is a serial cable that must run from the AVL device to the computer docking station. Usually a Trimble Placer Gold APU wired according to manufacturer instructions supplied with equipment.

An Opticom unit and associated wiring and controls

HEADLIGHTS CLUSTER

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

DAYTIME RUNNING LIGHTS

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

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

UPPER LIGHT MODULE

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

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

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

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

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

ARROW TURN SIGNALS

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

DOT CAB MARKER LIGHTS AND REFLECTORS**FRONT WHEEL WELL DIRECTIONAL LIGHT**

One (1) amber **LED** directional light shall be mounted on each side of the cab above the wheel well area. FMVSS reflectors shall be installed as required. These lights shall be Truck-Lite LED #60117Y with chrome cover #60719.

Five (5) DOT approved Truck-Lite Light Emitting Diode (LED) cab marker lamps shall be mounted on the front of the vehicle. The two (2) outer front marker/clearance lights shall be mounted, one (1) on each side on top of the cab, three (3) identification lights shall be mounted, horizontally spaced between 6" and 12" apart facing forward, centered on the front of the platform. The lights shall be amber in color.

Amber LED marker lights with integral reflectors shall be provided on the side of the cab adjacent to the driver's door, one (1) each side.

Truck-Lite Model # 18 red LED marker lights with integral reflectors shall be provided at the lower side rear, one (1) each side.

Truck-Lite # 60115Y yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side.

Truck-Lite Model #19 red LED clearance lights shall be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Truck-Lite Model # 33740R LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

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

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

LICENSE PLATE LIGHT - REAR

One (1) Weldon model # 9186 license plate light shall be provided above the mounting position of the license plate. The light shall be clear and shall have a chrome finish.

TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED white back-up lights, shall be mounted, one each side on a vertical plane with the turn/tail/stop signals. These lights shall activate when the transmission is placed in reverse gear.

Two (2) Whelen M6FCV4 mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange. The fourth opening shall be for the lower rear warning lights.

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

AUXILIARY REVERSE LIGHTS

Two (2) Zico #ZQL-SS-H7614 "Quic-Light" hull lights shall be provided in the rear wheel well panels, one (1) each side. The lights shall be recessed into the wheel well panel and shall be equipped with stainless steel housing. The lights shall be activated by the reverse light circuit when the apparatus is operating as an emergency vehicle (Primary Warning Switch On).

CAB STEP LIGHTS

Trucklite Super 40 LED shielded step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

BODY STEP LIGHTS

Chrome plated Weldon model # 9186, shielded halogen body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all body access steps and walkway areas.

DUNNAGE AREA LIGHTING

Two (2) chrome plated Trucklite model #44 dome LED sealed lights with chrome mounting cover #44701 shall be provided in the dunnage area to provide adequate illumination of this area. The lights shall be recessed in the vertical surface of the dunnage area. The lights shall be wired to the pump panel lights.

HOSE BED LIGHTS

Two (2) 6" Unity model AG chrome plated deck lights shall be mounted on each side of the hose bed. The light shall illuminate the hose bed area. Control switches shall be provided on the light heads.

AERIAL ACCESS LADDER ILLUMINATION

Two (2) Whelen LED lights, #3SC0CDCR, with chrome housings, # 3FLANGEC, provided for each aerial turntable access ladder.

The step lights will be actuated by the ladder power circuit.

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Fire Research Spectra 900 LED scene lights shall be provided, one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange. Each light shall be 9" wide by 6 3/4" high by 1 3/4" deep and produce 4,400 lumens. The scene lights shall be wired through the load management system.

SCENE LIGHTS - REAR OF BODY

Two (2) Fire Research Spectra 900 LED scene lights shall be provided, one on each side of the rear body panel in a chrome plated flange. Each light shall be 9" wide by 6 ¾" high by 1 ¾" deep and produce 4,400 lumens. The scene lights shall be wired through the load management system.

CAB DOOR LIGHT SWITCHING - CAB

Two (2) switches shall be provided in the cab warning light switch console to turn the lights at the cab doors on and off. One (1) switch shall control the driver side light and one (1) switch shall control the officer side light.

REAR OF BODY LIGHT SWITCHING - CAB

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

GROUND LIGHTS - CAB

One (1) Truck Lite Model 44 LED ground light shall be provided under each side cab door entrance step, four (4) total. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle. The rear crew door ground lights shall be positioned at an angle rearward to provide illumination at the pump panel and the front of the body work areas.

GROUND LIGHTS - PUMP PANEL

One (1) Truck Lite Model 44 LED ground light shall be provided under each side pump panel running board, two (2). The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - REAR

One (1) Truck Lite Model 44 LED ground light shall be provided under each rear body corner, two (2) total. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

ROOF MOUNT 215W LED BROW LIGHT - (2) FRONT DOOR RADIUS

Two (2) Fire Research Spectra LED Scene Light model SPA830-Q20 roof mount lights shall be installed. The lower mounting bracket shall allow the bottom of the lamp head to pivot and the upper mounting bracket shall extend out on a turnbuckle that is adjustable to set the lamp head angle. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

Each lamp head shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob.

The Spectra brow mounted flood light shall be located one (1) each side of the cab above the forward cab doors.

LIGHTS AT FRONT DOOR RADIUS SWITCHING - CAB

Two (2) switches shall be provided in the cab warning light switch console to turn the lights at the front door radius on and off. One (1) switch shall control the driver side light and one (1) switch shall control the officer side light.

****** BODY ELECTRICAL SYSTEM ********12 VOLT BODY ELECTRICAL SYSTEM**

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

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

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

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

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

BODY ELECTRICAL JUNCTION COMPARTMENT

A weather tight electric junction compartment shall be provided in the left side lower front compartment. This compartment shall be recessed through the inside rear wall of the compartment to provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment shall not decrease the storage capacity area of the compartment in which it is located. A removable panel shall be provided for access to this compartment.

AERIAL ELECTRICAL JUNCTION COMPARTMENT

An electric junction compartment shall be provided on the rear of the aerial body. This compartment shall be recessed through the rear wall of the body to provide an easily accessible enclosure to house all of the aerial device wiring junction points, terminal strips, solenoids, etc. All wiring for the aerial device including outrigger, diverter valve, and swivel circuits shall be enclosed in this compartment. The design of this compartment shall not decrease the storage capacity area of the body in which it is located.

PUMP ENCLOSURE WORK LIGHTS

Two (2) Truck-Lite Super 40 LED lights shall be provided inside the pump enclosure providing a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

ENGINE COMPARTMENT WORK LIGHTS

Two (2) Truck-Lite Super 40 LED lights shall be provided inside the engine enclosure that will provide a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

ROM TRACK MOUNTED COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the ROM LED V3 lights on the forward and rear edge of each body door opening. The lights shall be mounted in an anodized aluminum track provided by ROM either as a standalone unit or an integrated part of the roll up shutter door track. The lights shall be designed and manufactured to be water proof meeting the IPX7 industry standard and shall include a streamline optic lens and a fixed lumen output across 9-16vdc. Each LED module shall be of interlocking design and shall be able to be serviced/replaced without the removal of light assembly or shutter door.

TELESCOPING 215W SPECTRA LED FLOODLIGHTS

Three (3) 12 volt 215 watt Fire Research Spectra LED series SPA530-Q20 side mount push up telescopic lights shall be furnished. Lights shall be installed, one (1) on the driver's side rear of body up high (switched at the turntable console), one (1) left side dunnage area and one (1) right side dunnage area (switched at the pump panel). Final location shall be determined prior to construction.

Two (2) 12 volt 215 watt Fire Research Spectra LED series SPA510-Q20 top mount pull up telescopic lights shall be furnished. Lights shall be installed in a location to be determined prior to construction.

Each lamp head shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern and shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. Each lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob.

REAR OF BODY LIGHT SWITCHING - CAB

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

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

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

LIGHT PACKAGE ACTUATION CONTROLS

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

WARNING LIGHT FLASH PATTERN

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

UPPER LEVEL LIGHTING - WHELEN

NFPA ZONE A, UPPER

A pair of Whelen #FNMINI "Mini Edge Freedom", 24" LED cab roof warning light bars shall be furnished and rigidly mounted on top of the cab roof.

Each light bar shall be equipped with the following:

- Clear Lenses
- Two Corner Red Linear LED's
- One End Red Linear LED
- One White Front Linear LED.

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

NFPA ZONE C, UPPER

Two (2) Whelen L31H*FN super LED beacon lights shall be mounted one (1) each side at the rear of the body.

Each light shall have red LED's and a colored lens.

NFPA ZONES B & D REAR, UPPER

The lighting requirement for this area is covered by the lights noted in Zone "C" - Upper.

NFPA ZONES B & D FRONT, UPPER

The lighting requirement for this area is covered by the lights noted in Zone "A" - Upper.

LOWER LEVEL LIGHTING - WHELEN

NFPA ZONE A, LOWER

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

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

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

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

NFPA ZONE C, LOWER

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

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

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

NFPA ZONES B & D FRONT, LOWER

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

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

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

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

NFPA ZONES B & D MIDSHIP, LOWER

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

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

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

NFPA ZONES B & D SECONDARY MIDSHIP, LOWER

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

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

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

NFPA ZONES B & D REAR, LOWER

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

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

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

WARNING LIGHT SYSTEM CERTIFICATION

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

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

AUXILIARY WARNING LIGHTS

Two (2) surface mounted Whelen 50*03Z*R TIR-6 super LED light heads shall be furnished and mounted one (1) each side in the pump module rub rail.

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

The lights shall be installed with a 5TSMAC chrome plated mounting flange.

AUXILIARY WARNING LIGHTS

Two (2) surface mounted Whelen M6* super LED light heads shall be furnished and mounted one (1) each side low on the cab forward of the rear doors.

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

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

ROOF MOUNTED LIGHT BARS

A pair of Whelen model FNMINI, 24" Freedom, cab roof warning light bars shall be furnished and rigidly mounted, one (1) at each side on the cab roof facing to each side of the unit.

Each light bar shall be equipped with the following:

- Clear Lenses
- Two Corner Red Linear LED's
- One White Forward Facing LED
- One Red Side Facing LED

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

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be switched independently from the light package. Additionally, wiring for the independently switched lights specified, shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

ELECTRIC HORN

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

A three (3) position rocker switch shall be installed on the cab dash to activate from the steering wheel horn button one of the following: DOT horn, air horn, or electronic/mechanical siren.

BACK-UP ALARM

A Code 3, model # D450C, 87dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS

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

Both air horns shall be recessed in the front bumper.

The air horn(s) shall be controlled by the steering horn button as well as a floor mounted foot switch on the officer and the driver's side.

AIR HORN SHUT-OFF VALVE

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

ELECTRONIC SIREN AND SPEAKER

One (1) Whelen # 295HFS2, 200 watt electronic siren shall be provided featuring: flush mount remote control head recessed in center dash panel as space allows, "Si-Test" self-diagnostic feature, six (6) function siren, radio repeat and public address.

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

The electronic siren shall be operated by the foot switches and the horn button. The operation shall be as follows: the first tap shall activate the wail siren tone, each additional single tap shall change the siren to the next tone, and double tap to turn off the siren.

Two (2) additional foot switches shall be provided for operation of the electronic siren for the officer and driver.

Two (2) Whelen, model # SA122FMP polished aluminum siren speakers shall be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

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

The Q2-B siren shall be pedestal mounted on top of the extended bumper on the driver's side. The siren shall be equipped with a Federal model #P, chrome housing and pedestal.

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

PRICING FOR REFURBISH--KME ROANOKE

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

******The existing Waterous fire pump and drive unit shall be refurbished******

Refurbish of the pump system shall include the following:

- Overhaul fire pump with new impeller shaft assembly**
- Overhaul pump gearbox**
- Modify drivelines to accept pump**
- Rebuild all ball valves**
- Replace drain valves**
- Replace non-locking valve control rods with locking style rod handles**

PUMP

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

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

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

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

PUMP CONSTRUCTION

The pump body shall be close-grained gray iron and must be horizontally split in two sections for easy removal of the impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing setting of the pump in the chassis or apparatus piping which is connected to the pump. Pump body halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate reassemble.

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

IMPELLER SHAFT

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

BEARINGS

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

MECHANICAL PUMP SEALS

Stuffing boxes shall be integral with the pump body and be equipped with self-adjusting, maintenance free mechanical shaft seals.

PUMP TRANSMISSION

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

PUMP RATIO

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

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

PUMP SHIFT

The pump shift shall be pneumatically operated and shall incorporate a standard automotive air valve shifting mechanism for ease of maintenance and parts availability. The pump shift valve shall be mounted in the cab and identified as PUMP SHIFT, and include shift instructions permanently inscribed on the pump shift switch plate. The in cab control valve shall include a detent lock to prevent accidental shifting.

PUMP SHIFT INDICATORS LIGHT

*****The original pump shift indicator lights shall be used*****

TRANSMISSION LOCK

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

BRAKING SYSTEM

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

MAIN PUMP MOUNTS

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

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

*******Original pump mounting brackets shall be used and modified as necessary*******

****** PRESSURE CONTROL & ACCESSORIES ********PRESSURE RELIEF VALVE**

A Waterous relief valve system shall be positive and quick acting, and shall have a control valve to provide instantaneous hydraulic lock-out which does not require the operator to cancel out or disturb the pressure setting. Relief valve control (pilot valve) shall be protected from malfunction due to sand or other sediment in the water by a strainer which can be removed, cleaned and replaced from the operator's panel while the pump is operating. Relief valve indicator lights shall be provided and mounted on the panel adjacent to the pilot valve assembly. The indicator lights are to be "amber" and marked OPEN to indicate the relief valve is bypassing and "green" marked CLOSED to indicate when the relief valve is closed.

*******The existing relief valve system will be overhauled with the pump*******

INTAKE RELIEF VALVE

A Waterous pilot operated intake relief valve shall be provided by the pump manufacture. The pilot valve shall be mounted in a position specified by the purchaser, and allow adjustment from 50 psi to 250 psi. The pilot operated intake relief valve shall allow full opening of the relief valve with a very small rise in intake pressure above the set pressure.

PUMP CERTIFICATION

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

PRIMING PUMP

*******The original priming pump shall be used*******

*******The original primer valve shall be used*******

MASTER DRAIN

The Waterous manifold drain assembly shall consist of a stainless steel plunger in a bronze body with multiple ports. The valve shall be designed so that pump discharge pressure prevents it from opening accidentally. The drain valve control shall be panel mounted, cable or rod operated and identified PUMP DRAIN.

INDIVIDUAL BLEEDERS AND DRAINS

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

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

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

All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

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

*****Original piping shall be used--repaired and replaced as necessary*****

ANODE BLOCKS

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

The Anodes shall be painted Safety Yellow for identification purposes.

PUMP MODULE

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

*****The original pump module shall be used and modified as necessary*****

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

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

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

*****The original suction inlets shall be used*****

MONARCH INTAKE BUTTERFLY VALVE - MANUALLY OPERATED - DRIVER SIDE

The fire pump shall be fitted with a Waterous "Monarch" valve, on the driver side main suction inlet. The valve shall be mounted between the suction tube extension and the suction tube, and shall be recessed behind the operator's panel. The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze. The valve shall incorporate a pressure relief valve, set at the pump manufacturer's facility to a rating of 125 PSI. The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position. The valve shall incorporate a NFPA compliant, large diameter hose air bleed valve, controlled at the operator's panel.

The valve shall be operated by a hand wheel control, mounted near the suction inlet. The control shall incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position. The valve shall not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

PUMP SUCTION ENDS

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

*****The original suction inlets shall be used*****

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

*****The original caps will be used*****

One (1) 6" NSTF x 5" Storz Kochek SKE-R 30° degree adapter and cap shall be provided for the driver side main suction inlet.

AUXILIARY SIDE SUCTION(S)

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side rear auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

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

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels.
(No Exceptions)

*****The original auxiliary side suction will be used. Valves will be rebuilt and control rods will be replaced*****

TANK TO PUMP

One (1) 3" tank to pump line shall be piped into the tank sump. This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

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

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided between the pump suction manifold and the water tank. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing device. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

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

******The original tank to pump line will be rebuilt and used. Valves will be rebuilt and control rods will be replaced******

TANK FILL

One (1) 2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2" high pressure hose for tank connection to accommodate flexing between components. (NO EXCEPTIONS)

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided between the pump discharge manifold and the water tank. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing device. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

The valve shall carry a 10 year manufacturer's warranty.

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

******The original tank fill line/valve shall be used and modified as needed******

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

DISCHARGES

Two and one-half (2 1/2) inch or larger discharge outlets will be provided to discharge the rated capacity of the pump in accordance with NFPA 1901. Each discharge will be gauged and controlled from the operator's panel.

The main pump discharges will be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges. The valves will be equipped with integral, 30 degree, chrome plated "droop snoot" male outlets.

All discharges shall have chrome plated caps and retaining chains.

All discharges will terminate with NST male threads in accordance with NFPA 1901.

******Original discharge outlets will be used. Ball valves will be rebuilt and control rods will be replaced******

TFT ELECTRIC DECK GUN

A TFT Monsoon RC monitor shall be supplied and mounted on the deck gun discharge of the unit to provide the maximum travel clearance. The monitor shall be controlled from the pump operator's panel.

TFT MASTER STREAM NOZZLE

A TFT model "MASTER STREAM" 1500 g.p.m. electric nozzle shall be supplied with the deck gun.

TFT OPERATOR STATION

The electric deck gun shall be controlled using a TFT panel mount controller.

HORIZONTAL CROSSLAYS

The crosslay hose bed will be transverse, in three (3) sections and will be located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring will be removable, brushed finish, perforated aluminum material with a stainless steel scuff plate provided horizontally on each end.

Two (2) pre-connected hose storage areas will have a minimum total capacity of 3.5 cubic feet as required by NFPA 1901 to accommodate a minimum of 200 feet of 1 3/4" fire hose in each of the two (2) crosslays.

Each crosslay will be plumbed with 2" piping and equipped with a 2" valve and a 1 1/2" NST bronze hose swivel.

One (1) 2 1/2" hose bed will have a minimum capacity of 200 feet of 2 1/2" fire hose. The crosslay will be plumbed with 2 1/2" piping and a 2 1/2" valve and will terminate at the center of the transverse hose lay with a 2 1/2" NST swivel. This crosslay will be controlled and gauged at the pump operator's panel.

Each crosslay hose bed floor will be slotted to allow the swivel to extend up through, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

An individual control and gauge will be provided at the operator's panel for each pre-connected hose storage area.

The design of the crosslay configuration shall insure eas firefighter access from ground level.

******The original crosslay discharges shall be rebuilt and modified to fit in the available space******

The outer edge of the crosslays hosebed shall be trimmed with two (2) vertical and one (1) horizontal stainless steel rollers on each side of the vehicle to assist in hose removal.

PUMP ENCLOSURE HOSEBED HOSE RETENTION

A bi-folding 3/16" polished aluminum tread plate cross lay cover shall be provided. One (1) full length stainless steel hinge at the front of the cover and one (1) at the center located to rest on top of a cross lay partition for support. Two (2) butterfly type latches will be provided at the rear of the cover.

Vinyl flaps shall be provided at each side of the transverse cross lay compartment secured to the tread plate cross lay cover by quarter turn fasteners, and equipped with a strap to each end.

The crosslay end flap shall be black in color.

AERIAL WATERWAY DISCHARGE

The 4" aerial waterway discharge shall be gated at the pump by a full flow ball valve.

The piping from the pump to the rear of the vehicle shall be 5" minimum schedule 10 stainless steel pipe. The pipe shall connect to the turntable waterway swivel and shall also extend through the rear panel of the vehicle and terminate in (NST) thread with a long handle chrome plated cap at the rear of the body. This connection shall serve as the rear waterway inlet. The piping shall be a minimum of heavy duty, schedule 10 piping which shall incorporate a minimum of two (2) grooved pipe clamps for easy removal.

An Akron Brass 4" Generation II Swing-Out™ Valve shall be provided for the waterway discharge. The valve shall be equipped with the Akron "Tork-Lok" feature. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. All stainless steel parts shall be 316 grade for increased resistance to corrosion. The valve shall be compatible with a slow closing devise. The valve shall be quickly adjustable to one of eight handle options and require only 90° travel.

*****The original waterway will be used. The valve shall be rebuilt*****

The waterway discharge shall be operated with an Elkhart RC-10 Hand wheel controller. The valve shall be controlled at the pump operator's panel with a chrome plated hand wheel and mechanical valve position indicator.

FIRE RESEARCH FLOWMETER

The waterway discharge shall be equipped with a Fire Research "Insight" Ultimate Flow/Pressure Meter, which shall give the operator or engineer an indication of actual volume of water (in gallons) being discharged through the specified line. The display shall also be capable of showing discharge pressure without the need of pushing any buttons.

An analog/digital display shall be mounted on the pump panel in place of a standard pressure gauge. The waterproof display case shall be constructed of aluminum, with bright red LCD digits to indicate flow, and a bright analog pointer to indicate pressure.

A flow sensor paddle wheel shall be installed on the discharge piping with a machined housing or clamp.

A pressure transmitter (transducer) shall be mounted in the discharge piping to indicate pressure only when the valve is open.

****** PUMP PANEL & ACCESSORIES ********PUMP PANEL - SIDE MOUNT**

The pump operator's control panel shall be located on the driver side of the apparatus. The pump enclosure side panels shall be completely removable and designed for easy access and servicing.

******The original control panel will be used******

PUMP PANEL MATERIAL

The left side operator's panel, gauge panel, right side pump panel and right side access door shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard brushed finish.

******The original panel and access doors will be used******

HINGED GAUGE PANEL

A full width, vertically hinged gauge access panel shall be provided at the operator's position. Chrome plated positive locks shall be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

******The original panel will be used******

VERTICALLY HINGED, SPLIT PUMP PANEL OFFICER SIDE

The officer's side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the officer side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

******The original panel will be used******

Two (2) removable pump access panels will be furnished at the forward area of the pump enclosure. The panels shall be accessed through the compartments below the crosslays. Each access panel will be fabricated from 1/8" aluminum tread plate, bolted on to be removed for ease of access.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters shall be equipped with chrome plated ball chain and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polished trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL LIGHT SHIELD

The pump operator's panel shall be equipped with a light shield that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

- Four (4) Grote oval sealed LED lights.

Lamp #62601
Grommet #92420
Plug # 66815

One (1) light under the operator's panel light shield shall be actuated when fire pump is engaged in addition to the pump engaged light.

OFFICER SIDE PANEL LIGHT SHIELD

The officer side pump panel shall be equipped with a light shield that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

- Four (4) Grote oval sealed LED lights.

Lamp #62601
Grommet #92420
Plug # 66815

The center light under the right side panel light shield will be actuated when the fire pump is engaged in addition to the pump engaged light.

PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel shall accommodate the following:

- Hinged gauge panel
- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve

- Pump primer valve
- Engine throttle control
- Master compound vacuum gauge
- Master pressure gauge
- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer
- Engine oil pressure gauge with audible alarm
- Engine water temperature gauge with audible alarm
- Low voltage light and audible alarm
- Pump panel light switch
- Speed counter (Underwriters)
- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter
- Fuel Gauge
- Air inlet/outlet at lower driver side panel
- Relief valve with indicator light
- Relief valve drains
- Pump panel air horn actuation button.
- 5/8" Pump cooler (By-pass Line).
- Fire research "ThrottleXcel" throttle control.
- Waterous pressure relief valve control.

PUMP TEST PORTS

The pump panel shall be equipped with Vacuum & Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels. Chrome plugs and labels shall be provided for the test ports.

MASTER GAUGES

One (1) 4-1/2" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4-1/2" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be Class One Sub-Z II, silicone filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

FIRE RESEARCH "THROTTLEXCEL"**THROTTLE CONTROL AND MONITORING DISPLAY**

The apparatus shall be equipped with a Fire Research ThrottleXcel model ELA200-A00 engine throttle and monitoring display shall be installed. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 1/2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The engine RPM shall be set to idle when the pump engaged interlock signal is recognized regardless of the throttle control knob position. Optical technology shall be used to detect the direction and speed that the control knob rotated for RPM control.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Interlock; OK TO PUMP LED is green to indicate throttle ready.

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. Operator selections and inputs shall be via push buttons on the front panel.

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. The program shall have calibration and self-diagnostic capabilities. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- Low Oil Pressure
- High Engine Coolant Temperature
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- High Engine RPM.

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

ENGINE COOLER

An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator. The cooler shall permit the use of water from the pump for cooling system. The cooling shall be done without mixing engine and pump water.



TANK LEVEL GAUGE

An Innovative Controls model #3030385, Ultra-Bright LED water level monitor shall be provided on the pump operator's panel. The level gauge shall contain fourteen (14) high intensity LED's on the display in a "V" pattern allowing the full, 3/4, 1/2, 1/4 and refill levels to be easily distinguished at a glance. It shall be maintenance free and field adjustable.

The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

OPERATOR'S PLATFORM

A slide-out platform shall be located below the driver's side running board step. The platform shall be constructed from 2" aluminum tubing with Grip-Strut material inserts the step shall have a minimum weight rating of 500 pounds. Deployment of this platform shall be connected to the DO NOT MOVE TRUCK warning circuit. The step shall slide on stainless steel pins fitted in a machined frame which shall mount to the pump house frame. Drawer slides are not acceptable.

******* WATER TANK *******

WATER TANK CAPACITY

The current water tank will be removed and replaced with a poly tank built to have a maximum capacity of 500 gallons. NOTE: The capacity of the new water tank will be limited by the body dimensions.

WARRANTY

The UPF Poly IIE water tank shall be furnished with a lifetime warranty upon delivery.

CONSTRUCTION

The Poly water tank shall be constructed of PT3 polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

TANK LID

The tank cover shall be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowers shall accommodate the necessary lifting hardware.

TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3 polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to the exterior to allow water to overflow below the aerial body.

TANK SUMP AND CONNECTIONS

There shall be one (1) sump standard per tank. The sump is a minimum of 8" wide, 8" long with a 3/4" bottom and is located in the center front bottom of the tank, unless specified otherwise in special provisions. The sump shall have a threaded plug located at the bottom for a tank drain. An anti-swirl plate shall be mounted inside the sump approximately 1" off the floor of the sump.

OUTLETS

There shall be two (2) standard tank outlets; one for tank-to-pump suction line and one for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

CAPACITY CERTIFICATION

All tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

TANKNOLOGY TAG

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

TANK MOUNTING

The support structure of the tank shall be modified to support the tank by manufacturer's requirements. The tank shall be mounted within the body per NFPA and the manufacturer's requirements. The tank mounting surface shall be insulated with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank shall sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the tank mounting surface. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. A tread plate enclosure on top of the tank shall secure the tank in the mounts.

******* BODY AND COMPARTMENT SPECIFICATIONS *********GENERAL**

The aerial ladder, turntable, torque box, and fire body shall be refurbished as described. All specifications herein are in conjunction with the refurbishing process. This process shall include the removal of the Grumman ladder, torque box, and fire body from the current Grumman chassis and installing them on the new chassis specified within these specifications.

AERIAL DEVICE REFURBISHMENT**A PROOF LOAD TEST WILL BE REQUIRED PRIOR TO DISASSEMBLY.**

The current aerial device will be removed and disassembled. Each section will be placed in a ladder section fixture and evaluated. The handrails and base rails will be checked for straight appearance and any repairs or updates will be made. The breathing air bottle mounts will be removed and re-located with both bottles mounted on the opposite side of the device from the operator for better visibility. The sections will individually be sandblasted to clean bare metal in our media blast booth. Each section will be inspected by UL inspectors prior to paint. The sections will then be re-primed and painted with current paint process for new ladders as well as coated on the inside for rust protection. After paint, the sections will be moved to ladder assembly department to be re-assembled. Re-assembly will include all new wear pads, extend and retract cables, wiring and hydraulic hoses as well as goretracs. Cable pulleys will be inspected and replaced if damaged, new bushings will be installed in pulleys. New ladder heel pin bushings will be installed prior to re-installing the device. A UL certification test and KME proof load test will be included after repairs.

REFURBISHMENT

The Grumman ladder, turntable, torque box, outrigger housings, and fire body shall be completely sandblasted, treated with rustproofing material, and painted prior to installation on the new chassis.

The rustproofing application will provide the unit with a ten (10) year anti-corrosion warranty (underwritten by a third party insurance company) licensed in all 50 states.

Rustproofing will be applied during the assembly process and upon completion to insure proper coverage in all critical areas on the unit.

All wiring and hoses shall be replaced in accordance with these specifications.

All components shall be UL tested in accordance with these specifications.

The booster tank shall be replaced with the specified poly tank.



The fire body and compartments shall be prepped and painted according to specifications.

The interior of the compartments will be finish painted job color with a scuff resistant webbing type paint of a contrasting color applied over the painted surfaces.

The fire body and aerial shall be striped and lettered to match the apparatus chassis.

The fire pump shall be overhauled with a new impeller shaft assembly.

The pump gear box shall be overhauled and all drive lines shall be modified as needed.

All compound, master and individual pressure gauges shall be replaced with the specified pressure gauges.

The aerial waterway and all associated components shall be replaced as specified.

All ball valves shall be rebuilt.

All drain valves shall be replaced.

All non-locking control rods shall be replaced with locking style control rods as specified.

A throttle control shall be installed as specified.

The rear of the apparatus shall be converted to a flat back style and shall provide two (2) additional storage compartments.

The body shall have #4 polished stainless steel trim on each rear corner. The trim shall extend from the running board to the top. This trim shall be in the shape of a 2.5" 90 degree angle.

The four (4) outrigger covers shall be replaced with four (4) new polished finish stainless steel covers as specified.

The current ground pad storage for outriggers shall be removed. New storage shall be fabricated from smooth aluminum and will carry two (2) pads. Storage shall be installed on each side of the vehicle under the compartment box just behind the front outriggers, if space allows. The fire department shall be notified if storage will not fit in these areas and alternate mounting approved. Included will be four (4) total ground pads constructed of lightweight poly material and will include a rope type handle for carrying, eliminating crush damage.

CHASSIS DISPOSAL

It shall be the responsibility of the bidder to dispose of the existing chassis. The bidder shall report the estimated value of the existing chassis to Huntsville Fire & Rescue. The bidder shall retain any value associated with the existing chassis.

REMOUNT

The current turntable, torque box and body as well as the fire pump will be removed from the existing chassis. The torque box will be inspected for corrosion and structure damage. Any major defects will be reported to the fire dept. for repair approval. The torque box will be cleaned underneath and sanded to remove any surface rust or debris. Surface will be cleaned and coated with an epoxy primer surfacer and top coated with "RAPTOR" bed liner coating color matched to job color. The inside of the body and top of torque box and under water tank area will be prepared and coated using the same process. The torque box/body will be installed on the new chassis utilizing new hardware with verified torque value.

The rear tread plate a-frame step assembly will be removed and a new piece will be fabricated of smooth aluminum with tread plate catwalk or all tread plate. The new catwalk assembly will incorporate a new drop down stair case assembly on both sides for access to the turntable. The steps will include an additional step at the bottom that will drop down for an additional step for uneven terrain. Both steps will include a spring loaded pin to secure the steps while in the stowed position. Additional storage will be incorporated into the rear area under the catwalk where the current rear step is located if space allows after body is set in place.

A new Fire Research intercom system will be installed with stations located at the turntable, platform and pump operator panel. The platform unit will be a hands free operated unit while the remaining stations will be push to talk units.

COMPARTMENT DOOR HINGES

Hinges shall be full length polished stainless steel piano type with 1/4" minimum stainless steel pin size. The hinges shall be mounted with stainless steel hardware.

*****The original door hinges shall be used and replaced as needed*****

COMPARTMENT DOOR SEALS

All enclosed storage compartments shall include a full gasket around the perimeter of the compartment edge with heat resistant, "closed cell neoprene sponge" weather stripping, to insure a water tight seal.

COMPARTMENT DOOR LATCHES

Door latches shall be Eberhard #206 automotive type mechanism or equal. Latches shall be stainless steel "D" ring style handles for ease of operation even with gloves on.

The blank door in a double door configuration shall be provided with an internal two point slam paddle latch. Dissimilar metals insulating gaskets shall be placed between the door handles and outer door panels to prevent any electrolytic reaction between dissimilar metals to protect paint.

*****Original door latches shall be used and replaced as needed*****

One (1) compartment door(s) shall be equipped with keyed locking door latches. Two keys shall be furnished for each lock and shall be labeled to indicate the correct match.

COMPARTMENT DOOR STAY ARMS

Two (2) Eberhard gas shock type door hold open devices shall be provided for each horizontally hinged door.

COMPARTMENT TOPS

Compartment tops shall be covered with polished aluminum tread plate on both sides.

COMPARTMENT DRIP MOLDING

Compartment tops over all side compartments shall be equipped with a flanged edge to provide protection against water runoff. A secondary extruded drip molding shall be provided between low compartments and auxiliary high side compartments.

COATED FASTENERS

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

NOTE: The use of aluminum pop rivets or self-tapping screws as trim fastener shall not be acceptable.

BODY TRIM

The body shall be protected and covered with bright finish polished aluminum tread plate. The tread plate shall be fastened with stainless steel hardware and shall be coated with rubber type undercoating between the body panel and tread plate to protect from moisture. All edges shall be sealed with silver, rubber caulking.

Polished aluminum tread plate shall be provided in the following areas:

- All surfaces over the compartments or on top of the body where personnel may walk or mount equipment
- Entire front of body
- Below aerial turntable decking
- Top of the pump enclosure
- Cover over the water tank
- Cover over hydraulic tank

TREAD PLATE & TRIM

The current tread plate panels shall be replaced with new tread plate panels fabricated of anti-skid aluminum tread plate. All pieces used as overlays shall be coated on the back side to prevent electrolysis and corrosion from dissimilar metals. Any trim or accessories mounted to a painted surface shall have an electrolysis barrier and be attached with stainless steel screws with a thread locker material and clear seal under the head that will serve as an electrolysis barrier.

BODY SCUFF PANEL

A polished stainless steel scuff plate, approximately 2" x 2" shall be installed on the rear body corners. The scuff plate shall extend the full height of the body corner panel.

PAINTED REAR BODY PANEL

The entire rear of the body shall be overlaid with smooth aluminum painted job color, which shall extend the full width between body side compartments. This panel shall be full height from the bottom of the body to the turntable. The rear panel shall have an opening to access the ground ladder storage area. Each opening shall be equipped with roll-up or hinged doors as specified in the ground ladder storage section.

OUTRIGGER COVER PANELS

Each outrigger opening shall be covered by a panel mounted to the outrigger beam. The panels shall be fabricated from 14 gauge #8 finished stainless steel. Each panel shall be adjustable up and down to help match the panel to the body lines.

The outrigger covers shall be fabricated only as wide as the outrigger beam to allow positioning of the outriggers between parked cars or in tight areas.

BODY RUB RAILS

Sacrificial C-Channel style rub rails shall be mounted at the base of the body, extend outward from the body. The rub rails shall extend the full length of the main body. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

******Original rub rails shall be used and replaced/repared as needed******

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

REAR BODY MODULE

The rear of the body shall be designed to include the structural frame bolted to the rear of the body to support the rear turntable access steps, the rear compartments and the central outrigger control panel.

REAR "A" FRAME TURNTABLE ACCESS LADDER

Two (2) turntable access ladders, one on each side, shall be provided at the rear of the apparatus in an A-frame configuration. The access ladders shall be bolted to the rear body panel and the rear tailboard step, providing a sacrificial and completely replaceable rear body module. The framework for the steps shall be fabricated from 1/8" polished aluminum tread plate, providing a mounted surface for the rear light cluster and the outrigger controls. A minimum of three (3) steps shall be provided and shall be fabricated from cast open grate material providing a non-slip surface on each step. The steps shall provide access or egress to and from the aerial device turntable.

REAR DROP DOWN STEP

A drop down step shall be provided at the bottom of each access ladder to keep stepping area to a minimum when the vehicle's outriggers are in operation. The step shall swing down into position and shall be fabricated from cast open grate material, which shall be bolted to framework fabricated from 1/2" aluminum. A safety pin shall be provided to secure the step in the stowed position. The dropdown steps shall be incorporated in the "DO NOT MOVE TRUCK" warning circuit.

BODY HANDRAILS

All non-aerial device handrails are to be 1-1/4" diameter ribbed aluminum extruded tubing with chrome plated end brackets.

Locations shall be as follows:

- Two (2) handrails attached to the each side of the side of the rear body access ladder.
- One (1) on the body above the rear body access ladder.

FOLDING STEPS - FRONT OF BODY

Six (6) Trident (P/N 24.005.3) illuminated large folding steps made of high strength die cast aluminum, with a textured chrome plate finish, minimum of 42 in² surface, conforming to NFPA-1901 requirements, shall be provided on the front face of the running board compartments, above running board steps, three (3) each side. The steps shall be mounted to accommodate access to the body hose bed area with a maximum of 18" height between each step.

The lights shall be interlocked to the parking brake and DOT marker light circuits.

REAR WHEEL WELL LINERS

Fully removable, bolt-in, 1/8" aluminum fender liners shall be provided. The wheel well liners shall extend from the outer wheel well body panel, into the truck frame. Removable vertical splash shields, inward of the wheels, shall be provided to give access to the hydraulic components. The completely washable fender liners shall be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion.

*****Original wheel well liners will be used*****

REAR FENDERETTES

The rear fenders shall be equipped with easily replaceable, polished extruded aluminum fenderettes. The fenderettes shall be equipped with a rubber gasket molding between the body panel and the fenderette.

*****Fenderettes will be retrofitted to the wheel wells to provide an aesthetically pleasing appearance*****

REAR MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

VINYL HOSE BED COVER - 1/4 TURN FASTENERS

A hose bed cover shall be provided and installed. The cover shall be made from 22 ounce; heavy-duty vinyl coated polyester fabric (TXN 226). The cover shall be sewn with ultraviolet resistant thread and shall have 2" wide nylon webbing sewn around the perimeter to provide additional strength.

The cover shall be secured to the top front body flange with quarter-turn fasteners. The cover shall be secured to the side body flanges with quarter-turn fasteners. A weighted flap shall be furnished on the rear of the cover with two (2) bungee cords.

The Hypalon material shall be red in color.

****** 120/240 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ********120/240 VOLT ELECTRICAL SYSTEM TESTING**

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

OPERATIONAL TESTING

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The generator shall be started from a cold start condition and the line voltage electrical system shall be loaded to 100 percent of the nameplate voltage rating.

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HYDRAULIC DRIVEN GENERATOR

The generator system shall be an Onan model 10RBAB-2010C, PTO/Hydraulic, rated at 10,000 watts, 83/42 amps @ 120/240 VAC, single phase generator. The generator shall maintain a 60 Hz frequency between 850 and 3000 rpm.

The generator shall consist of hydraulic motor, alternator, cooling fan and a heat exchanger in a stainless steel housing. The reservoir shall be a 3-gallon hydraulic tank with an integral filter, gauge, temperature switch, breather and fill port.

The Onan limited warranty covers virtually everything except routine maintenance for the first five (5) years or the first 1000 hours of operation.

120/240 VOLT WIRING

The generator output conductors shall be 8 gauge and the output conductors shall be routed through non-metallic conduit 3/4" in diameter.

120/240 VOLT DISPLAY

The digital Onan display shall be by FRC and shall display Hz, voltage, amperage, oil temperature and hours. The meter shall be installed near the breaker panel.

GENERATOR PTO

A hot shift PTO shall be provided on the transmission for the Onan generator. The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator shall have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

GENERATOR CONTROLS

In addition to cab controls, the generator shall have PTO control at the pump operator's panel. The controls shall also include a green light to indicate the generator is running.

GENERATOR LOCATION

The generator shall be permanently mounted on top of the body.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

120/240 VOLT LOAD CENTER

The generator output line conductors shall be wired from the generator output connections to a Square D, model #QO120L125G breaker panel. The breaker panel shall be equipped with a properly sized main breaker using two (2) of the twenty (20) spaces which leaves a total of eighteen (18) available spaces.

The generator output conductors shall be sized to 115% of the main breaker rating and shall be installed as indicated in the wiring section.

Eighteen (18) appropriately sized, 120 volt, circuit breakers shall be provided.

The breaker panel shall be located on the rear wall of the driver side upper compartment.

120/240 VOLT WIRING METHODS

Wiring/conduit shall not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring shall be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports shall be of nonmetallic material or corrosion protected metal. All supports shall not cut or abrade conduit or cable and shall be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment shall be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing shall be provided.

The installation of all 120/240 wiring shall meet the current NFPA-1901 Standards.

120/240 VOLT WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box shall be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends shall be labeled showing function and wire size.

120/240 VOLT GROUNDING

The neutral conductor of the power source shall be bonded to the vehicle frame only at the power source.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. The conductor shall have a minimum amperage rating of 115 percent of the name plate current rating of the power source specification label.

120/240 VOLT CIRCUIT BREAKER / RECEPTACLE INSTALLATION

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits shall be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

120/240 VOLT RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

One (1) 120 volt, NEMA L5-20, 20 amp, duplex receptacles with a grey thermoplastic, corrosion resistant, weatherproof cover shall be installed at each side of the of the rear body panel. (Total of two (2))

Each receptacle shall require one (1) 20 amp, 120 volt circuit breaker to be installed in the load center, for a total of two (2) breakers.

Two (2) 120 volt, NEMA L5-20, 20 amp, duplex receptacles with a grey thermoplastic, corrosion resistant, weatherproof cover shall be installed as directed by the fire department.

The receptacle(s) shall require 20 amp, 120 volt circuit breaker(s) to be installed in the load center to properly protect the one (1) receptacle(s).

ELECTRIC CORD REEL (220 VOLT)

One (1) Hannay Model #ECR-1620-17-18, with 4 conductor collector assembly for 240 volts, with electric rewind cord reel shall be provided and wired to the breaker panel. The reel shall be securely mounted and equipped with toggle switch for "rewind power" and a push button switch for "rewind function".

The cord reel shall be mounted as directed by the fire department.

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

ELECTRIC CABLE

Two hundred (200) feet of Type SO yellow 10/4 heavy duty electric cable, wired for 240 volt, shall be provided on the cord reel.

One (1) NEMA L14-20R, 20 amp, four prong twist-lock receptacle shall be provided on the end of the cable.

JUNCTION BOX

One (1) Circle-D Model #PF-GFCI-1P, four (4) outlet junction box(s) with one (1) duplex NEMA 5-20R GFCI rated straight blade receptacle and three (3) NEMA L5-15R twist-lock receptacles with 6" pigtail with a NEMA L14-20P twist-lock plug shall be provided.

The junction box(s) shall be wired such that the four (4) outlets provide 120 VAC.

CABLE ROLLER ASSEMBLY

One (1) four (4) roller assembly(s) shall be provided adjacent to each cord reel to provide unobstructed deployment and rewinding of the cable.

One (1) cable ball stop(s) shall be installed on the cable to keep the cable end from passing through the roller assembly.

One (1) holder(s) constructed from 1/8" aluminum tread plate shall be provided for each cord reel(s) junction box. The location of the holder shall be adjacent to the cord reel roller assembly or as directed by the fire department.

****** GROUND LADDERS AND ACCESSORIES ********GROUND LADDER STORAGE AREA**

All ground ladders (except as noted) shall be stored in the center of the aerial body. One (1) bank of ladders shall be stored on each side of the turntable pedestal center support, inside the center section of the body.

*******The original ground ladder storage area will be used*******

A roll-up door shall be provided for the ladders at the rear of the vehicle. If the body compartments are equipped with roll-up doors, the ladder storage door shall be the same brand.

*******The original roll-up doors will be used*******

GROUND LADDERS

The following Alco-Lite ground ladder compliment shall be provided:

- One (1) Alco-Lite model PEL3-40; 40', aluminum, three (3) section extension ladder shall be provided.
- One (1) Alco-Lite model PEL-35; 35', aluminum, two (2) section extension ladder shall be provided.
- One (1) Alco-Lite model PEL-28; 28', aluminum, two (2) section extension ladder shall be provided.
- One (1) Alco-Lite model PRL-20; 20', aluminum, straight roof ladder with folding hooks shall be provided.
- Two (2) Alco-Lite model PRL-16; 16', aluminum, straight roof ladder with folding hooks shall be provided.
- One (1) Alco-Lite model AEL-14; 14', extending, aluminum, attic ladder shall be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ********PIKE POLE STORAGE**

Six (6) pike pole tube(s) shall be provided. Each shall be an individual tube type holder, mounted in the ladder storage area (if space allows). Each holder shall be equipped with a spring type holder and shall be accessible from the rear of the apparatus. Each pike pole holder shall be labeled to indicate the pike pole length.

*******The original pike pole tubes shall be used*******

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts
- 1 - Complete set of hydraulic filters for the pressure filter and the return line filter
- 2 - Complete sets of aerial override keys

LOOSE EQUIPMENT

The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

****** 102' AERIAL LADDER/PLATFORM ********HYDRAULIC SYSTEM**

The hydraulic system shall provide power to the entire aerial device as efficient as possible without the use of a hydraulic cooler.

A hydraulic system relief valve as well as individual circuit relief valves shall be provided to prevent damage to any function or circuit. The relief valve shall have a stainless steel relief spring to ensure proper function and product reliability.

HYDRAULIC HOSE, TUBING AND FITTINGS

All hydraulic steel tubing, hydraulic rubber covered wire braided hoses, and hydraulic fittings/adapters shall have a minimum burst pressure rating of four times the operating pressure. Hoses and tubing shall be properly sized to minimize heat buildup during extended periods of operation. Hoses and tubing shall be properly sized to minimize flow restrictions.

All hydraulic hose shall have a tube and cover constructed of Nitrile elastomers and shall have a braided/spiral wire reinforcement capable of maintaining a 4:1 safety factor in all areas of the hydraulic system. The hose shall meet the appropriate SAE performance specifications: 100R2 or 100R12.

KME has implemented the most efficient, leak-free, fluid connector design in the industry. KME's entire aerial line has been certified as a Parker Genuine Parts design.

The connector system was jointly designed by engineers from both KME and Parker Hannifin and incorporate the following design upgrades and advantages to the City of Huntsville Fire Rescue:

- All hydraulic ports (manifolds, pumps, tank, etc) to elastomeric sealing technology;
- No pipe threads in the hydraulic system
- Sealing to be done by O-rings with the mechanical holding power of straight threads.
- All tube and hose connections to Parker Seal-Lok, O-ring face seal technology.
- Sealing to be done by o-ring with the mechanical holding power of straight thread.
- Fittings rated up to 6000 psi.
- Drop-in design of Seal-Lok connectors to allow easier maintenance and assembly.
- Fitting resist 200% over torque, with optimum vibration resistance.
- Shaped fittings machined from forged bodies for compact design and strength.
- Fittings meet/exceed the performance and dimensional requirements of SAE J1453.
- Minimized unnecessary fittings and adapters, streamlining the system.
- Increased connector accessibility, making assembly and maintenance easier.
- Standardized the connector system on the AERIAL unit.
- Incorporated pressure diagnostic system with Parker PD diagnostic test points into the connector design

PARKER FACTORY TRAINING

All fluid connector assemblers have been trained and certified in Dry Technology.

This training included: proper handling, installation, torque requirements, troubleshooting, and quality control procedures of the fluid connector products.

LEAK-FREE GUARANTEE

An exclusive three-year leak free guarantee shall warrant the Seal-Lok, O-ring face seal connections to be leak-free for a period of three (3) years.

HYDRAULIC PUMP

A load sense pressure compensated hydraulic axial piston pump shall be provided which shall be capable of operating under any rated aerial load condition and aerial device position at normal engine idle or governor controlled fast idle. The hydraulic pump shall be capable of generating sufficient flows to allow multiple aerial functions without significant loss of speed.

HYDRAULIC OIL RESERVOIR

A 67 gallon hydraulic oil reservoir shall be provided to supply the needs of the hydraulic system. A 2" gated suction line shall be provided between the oil reservoir and the hydraulic pump. The tank fill shall be provided with a strainer screen and vent cap. Located near the fill cap shall be a dip-stick for checking fluid levels. The tank shall be mounted in the top, front portion of the body. The tank shall be constructed from 10 gauge steel, which shall be welded at all interior and exterior seams. Before adding fluid the tank must be cleaned and free from all contaminants.

Suction and return ports will be designed to SAE Straight Thread O-ring Specifications. These ports will incorporate an o-ring seal rather than pipe threads.

*****The original hydraulic oil reservoir shall be used*****

HYDRAULIC OIL - REGULAR - A / W 46

The hydraulic oil reservoir shall be filled with A / W 46 grade Hydraulic Oil. This oil provides superior anti-wear properties, and is specially formulated with improved thermally stable additives. These oils offer outstanding resistance to sludge formation, are chemically stable and exhibit excellent anti-wear protection.

AUTOMATIC DIVERTER VALVE

There shall be an automatic electric over hydraulic three (3) position diverter valve located at the center rear of the apparatus. This diverter valve shall divert hydraulic fluid to either the aerial ladder controls or the outrigger controls.

To prevent accidental operation of the ladder prior to the outriggers being properly set, the diverter valve shall only allow hydraulic fluid to the outriggers until the outriggers are set properly.

To prevent accidental operation of the outrigger system during the aerial ladder operation the diverter valve shall only allow hydraulic fluid to the ladder controls, when the aerial device is raised from the aerial travel support.

In the event of electrical failure the operator shall be able to manually move the diverter valve to the ladder or outrigger position for continuous uninterrupted operation.

OUTRIGGER SYSTEM HYDRAULIC CONTROL VALVES

The outrigger cylinder system shall be controlled by a pressure compensated, proportional control valve that is designed for parallel hydraulic circuit operations. The valve will be proportional type to provide the smoothest, precise operation of the outriggers. Devices utilizing on/off type outrigger control valves in lieu of proportional valve shall not be acceptable!

This valve shall be modular in design so that individual sections can be replaced in the field, rather than complete valve assemblies, thus reducing maintenance costs. The valve housings shall be made of high tensile cast iron for durability and the individual spools shall be hard, chrome plated for long life and resistance to corrosion. Each valve shall be equipped with a heavy-duty electric solenoid for electric control of the outrigger from the remote operator's station and mechanical handles of ease in override operations. The mechanical handles shall be equipped with large knobs with integral labels inside each knob indicating the function of the handle.

The outrigger valves shall be controlled by the IQAN control system. Adjustments and troubleshooting shall be accessible from the MDIII display at the turntable control station.

LIFT, EXTENSION AND ROTATION HYDRAULIC CONTROL VALVE - ELECTRIC

Three (3) ladder directional controllers shall be mounted on the turntable control console. They shall control extend/retract, rotation, and elevation. These controllers are part of the computer operated IQAN motion control system allowing safe operation of the ladder.

The main control valve shall be positioned at the turntable control console for direct manual override control of each aerial function.

The controllers shall incorporate ICB; J-1939 can bus signaling, transmitted through two (2) J-1939 communication wires to reduce the chance of electrical failures since fewer wires and terminals shall be utilized. Additionally, voltage sensitivity is eliminated thus providing superior motion control. Joystick controllers that utilize potentiometers or mechanical switches to control motion shall not be acceptable.

Adjustments and troubleshooting shall be accessible from the MD3 display at the turntable control station.

PRESSURE FILTER

The pressure filter shall be made of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The pressure filter shall have a bypass circuit protected by a check valve, which shall be installed around the pressure filter. The pressure line filter shall be required even if a suction line filter is provided in the reservoir due to the suction line filter's inability to trap contaminants entering the system.

The pressure filter cartridge shall have a sensor, which shall indicate the condition of the filter and provide a warning text message at the MD3 displays. The MD3 shall display a light warning if the pressure filter is blocked or in the bypass mode.

The pressure filter shall have an absolute rating of five (5) microns.

RETURN FILTER

The return filter shall be made of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The return filter shall have a bypass circuit protected by a check valve, which shall be installed around the return filter. The return filter shall have a bypass circuit protected by a check valve, which shall be installed around the return filter.

The return filter cartridge shall have a sensor, which shall indicate the condition of the filter and provide a warning text message at the MD3 displays. The MD3 shall display a light warning if the return filter is blocked or in the bypass mode.

The return filter shall have an absolute rating of five (5) microns.

COMPUTER OPERATED IQAN MOTION CONTROL SYSTEM

The ladder, outrigger system and interlock systems shall be controlled with the computer operated and monitored hydraulic motion control system. The motion control system shall provide state of the art controls for the ladder, outriggers, auto-level and interlock systems. The motion control system will be an electro-hydraulic management system that monitors operator inputs from the control station(s) and converts this data to a usable electronic signal that controls hydraulic valve functions.

The turntable and platform control stations shall be equipped with a Master Display Module (MD3). The Master Display Module (MD3) shall be a completely weather proof and shock resistant micro-processor which includes a 3" x 4.5" LCD screen (referenced above). Each MD3 shall contain programmed parameters for each aerial device function, which provide for proper machine operation and reduce the possibility of abusive operation. The number of wires required to connect the MD3 module and control hardware shall be kept to a minimum through the use of serial CAN-bus data transmission technology. The CAN-bus modules shall be attached to each other using just two communication wires.

Each component of the IQAN motion control system shall be proven, off the shelf modules and parts, which are available throughout the world. Proprietary hardware designs are not acceptable at KME due to the lack of parts availability and support.

The MD3 module shall also be capable of monitoring engine and transmission J1939 parameters and warn the operator if there are any conditions of the motion control system out of the set ranges. The MD3 display will have built-in troubleshooting and shall allow troubleshooting and function history monitoring for the entire motion control system. The memory function will allow a service technician to identify if these warnings were ignored or overridden.

The IQAN motion control system shall receive rotation information from an absolute encoder located on the rotation swivel. The encoder shall provide absolute position of the turntable at any given position from 0 degrees to 360 degrees of rotation.

An MD3 information center shall be provided at each aerial control station. The MD3 display shall allow the system to be diagnosed and calibrated without the need for separate controllers or computers.

The turntable and platform MD3 displays shall indicate the following information from on-demand screens:

- Elevation angle of the ladder.
- Continuous ladder extension percentage.
- Degree of rotation from centerline of vehicle.
- E-Zone™ cab and body avoidance warning.
- E-Zone™ short jack warning.
- Cradle alignment message.
- Device tip moment load monitoring.
- E-Speed™ ladder tip speed control.
- E-Cush™ function ramping control for elevation.
- E-Cush™ function ramping control for extension and retraction.

The MD3 screens at the turntable and the platform will also display warning/message screens to alert the operator to a potentially unsafe condition of the aerial device.

EMERGENCY HYDRAULIC PUMP SYSTEM

In the event of failure of the main hydraulic pump or vehicle engine, the unit shall be equipped with **two (2) emergency hydraulic pumps** which shall be parallel plumbed into the hydraulic system and be electrically driven from the chassis batteries. The emergency pump system shall be capable of limited functions of the ladder and outriggers to stow the unit. The pumps shall be controlled from both the right and left outriggers and turntable control stations with spring loaded momentary contact switches.

Each pump shall have a separate hydraulic oil supply line, from the main supply line attached directly to the hydraulic oil reservoir. A shutoff valve for each line shall be provided and check valves shall be incorporated on the pressure side of both pumps to ensure that one shall continue to operate the ladder in the event the other fails.

Each pump shall have high tensile steel shafts and gears with the shafts supported by needle bearings. The cylinder plate and gears shall be ground as a set to ensure exacting tolerances. Clearance shall be maintained by a Mylar shim.

******The original pumps shall be used. New plumbing shall be provided.******

POWER TAKE OFF (PTO) 12 VOLT SWITCH

The apparatus shall be equipped with a power shift PTO driven by the chassis transmission. An indicator light shall be located in the cab next to the PTO switch to show when the PTO is engaged. The PTO shall only engage with the parking brake applied and the transmission in neutral. If the unit is equipped with a pump, the PTO shall be active if the transmission is in "Drive", only if the fire pump is engaged. The PTO shall be a heavy duty pressure lubricated and cooled unit for extended operations.

A master 12 volt "Ladder Power" switch shall be provided adjacent to the PTO switch for control of all ladder 12 volt power, with the exception of the emergency pump circuits.

AERIAL HOUR METER

An aerial hour meter shall be installed in the cab adjacent to the ladder power and PTO control switches. The hour meter shall be wired to the aerial PTO circuit to record hours of operation for the aerial. The hour meter shall aid in scheduling preventative maintenance as outlined in the operator's manual.

ENGINE FAST IDLE ACTUATOR

The fast idle actuator shall be used to raise the engine RPM to a preset level for proper aerial operation. The fast idle switches shall be located at the main outrigger control station and the aerial control station/s.

For the safety of personnel and equipment, the fast idle system shall not activate unless the transmission is in neutral.

TORQUE BOX

A torque box shall be provided to transfer all aerial loads and torque into the four outriggers, thus preventing the loads from being transferred through the chassis. The torque box shall be constructed of .375" steel plate with the exception of the turntable area which shall be .50" steel plate. The torque box sub frame assembly shall be capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers. An open base shall be designed to accommodate the storage of ground ladders as specified in the body portion of these specifications. The torque box shall be bolted to the chassis frame rails with forty two (42), 3/4" SAE grade 8 bolts and nuts.

This type of construction shall be required for the following reasons:

- Replacement of the chassis in the event of vehicle damage to this chassis.
- Replacement of the chassis due to age.

******The original torque box shall be used. The torque box shall be sandblasted, treating with a rust proofing material, and painted prior to installation on the new chassis.******

OUTRIGGERS

The outrigger beams shall be removed from the housing and the jack tubes shall be disassembled. The beam extension and down jack cylinders shall be overhauled. Outrigger beams and jack tubes shall be sand blasted and re-primed and painted black in color. Reflective striping and "crush hazard" warning labels shall be installed. "PULL PINS" verbiage shall be applied over the reflective stripe as a reminder for the operator to remove the safety pins before retracting the jacks. Outrigger assemblies shall be re-assembled utilizing new hardware with verified torque value, also includes new stretch wiring in the housing and new hydraulic hoses with protective wrap.

The current outrigger body panels shall be replaced with new mirror stainless panels.

AUXILIARY STABILIZER PADS

Four (4) auxiliary pads with handles shall be provided for additional load distribution on soft surfaces. Their size shall be 24.00" x 24.00" and they will be constructed of a composite material. The ground contact area for each stabilizer shall be such that a unit pressure not greater than 75 psi (500 kPa) shall be exerted over the ground contact area when the apparatus is loaded to its maximum in-service weight and the aerial device is carrying its rated capacity in every position permitted by KME.

The auxiliary pads shall be secured in mounts located below the body compartments.

OUTRIGGER GROUND PADS

The current ground pad storage for outriggers shall be removed. New storage shall be fabricated from smooth aluminum and will carry two (2) pads. Storage shall be installed on each side of the vehicle under the compartment box just behind the front outriggers, if space allows. The fire department shall be notified if storage will not fit in these areas and alternate mounting approved. Included shall be a total of four (4) ground pads constructed of lightweight poly material and will include a rope type handle for carrying eliminating crush damage.

OUTRIGGER/LADDER INTERLOCK SYSTEM

An interlock system shall be provided between the outriggers and ladder that prevents the operation of the ladder until the operator places all jacks in the load supporting configuration. Each outrigger shall be equipped with a pressure sensitive switch that closes only when the jack is firmly in contact with the ground. Until all jack switches close, electrical power shall not be transmitted to the turntable (hence preventing ladder operation). A key controlled override switch shall be provided at the central outrigger control station for emergency override of the interlock system. A green indicator light shall be provided on the outrigger control panel to indicate the position of the foot pad. Illumination of the indicator light indicates firm ground contact.

OUTRIGGER DEPLOYMENT WARNING ALARM

An outrigger deployment warning device shall be provided to warn personnel in the vicinity of the apparatus that the outriggers are in motion. Whenever an outrigger control is utilized, the device shall produce a pulsing tone, separate and distinctive from that of other audible warning systems provided on the apparatus. When the outrigger control is released to its neutral position, the signal shall cease.

OUTRIGGER LIGHTING

Each outrigger shall be equipped with the following light package:

One (1) Truck-Lite Model 91 LED outrigger warning light with red lens shall be installed on each outrigger.

The outrigger warning lights shall be energized by the ladder power circuit.

One (1) adjustable, Truck-Lite Super 40 LED, sealed light mounted under the body, to illuminate each outrigger foot pad area.

Both the flashing lights and the foot pad illumination lights shall be energized by the ladder power circuit.

OUTRIGGER SCOTCHLITE - CHEVRON

Red/Yellow ScotchLite material in a Chevron pattern shall be furnished on both sides of the horizontal and vertical beams of the rear outriggers.

OUTRIGGER LASERS

Each outrigger shall be equipped with a Class 3A red laser adjusted to aid in the placement of the auxiliary jack pads. The lights shall be wired to turn on when the aerial PTO is engaged and the parking brake is applied. The lights shall turn off when an outrigger is extended. A momentary switch shall also be provided for the driver to activate the lights without the aerial/park brake engaged.

The auxiliary pads shall be equipped with a ScotchLite target on the center of each pad.

OUTRIGGER CONTROLS - TETHER TYPE

A portable electronic outrigger control stations shall be provided on the rear of the apparatus. The hand held outrigger control box shall be weatherproof and oil resistant. The control box shall have an extension cable and shall allow the outriggers to be controlled from as far away as 15 feet from the vehicle to allow for clear vision of outrigger movement.

Out and down outrigger control functions for each outrigger shall be operated independently, so that vehicle may be set up in restricted areas or on uneven terrain. The diverter valve override control shall be mounted at the center rear hydraulic area behind the hinged outrigger control panel along with the override key and EPU actuator switch.

A hinged panel shall be provided at the rear center of the body. The rear panel shall be equipped with a stainless steel hinge, which shall allow the operator to access the diverter valve manual override control, outrigger manual override controls, the electrical system back-up switch, override key switch and EPU controls and hydraulic filter indicator lights.

The portable outrigger control box shall incorporate the following:

- Four (4) outrigger fully extended indicator lights
- Four (4) outrigger set indicator lights
- Four (4) outrigger control toggle switches
- One (1) Fast idle control
- One (1) Ladder Operation indicator light
- E-Cush™ Automatic Leveling Control System Controls

COMPUTERIZED OUTRIGGER LEVELING SYSTEM

The outrigger control system shall incorporate technology to provide Computerized Self Leveling System, in addition to standard outrigger controls. The auto-level system shall be controlled by the motion control system.

The computerized system shall assure full outrigger extension, proper jack penetration for safe operation of the aerial device.

The controls for the auto level shall be located on the portable outrigger control box. The control panel shall include the following:

- "Automatic/Manual" selector switch
- "Level Truck" control switch
- "Raise/Lower Truck" control switch
- "Stow" control button

Operation of the system shall be in the following sequence:

- Select "Automatic" mode on the Automatic/Manual selector switch.
- Extend all outriggers with the outrigger toggle switches. (Be sure the area around the outriggers is clear of personnel or obstructions)
- Place the outrigger auxiliary footpads into position.
- With the jack clear of obstruction activate the "Level Truck" button, which shall extend the vertical jack beam to a safe down pressure set point and level the truck in a few seconds. When the truck is level, the "Ladder Operation" indicator lights shall illuminate.
- Once the truck is level, activate the "Raise/Lower Truck" button until the truck is at the desired height.

The system shall automatically stow the outriggers if desired by the operator. To activate the "Stow" function, the ladder shall need to be in the cradle. When the operator activates the "Stow" button, the outriggers shall lower the truck to the ground (retracting the jacks), the system shall pause for ten (10) second, then retract the outriggers to their full nested position.

OUTRIGGER LEVEL

One (1) bubble type side to side leveling device shall be provided at the rear of the apparatus to assist in the aerial device setup. This device shall be mounted in the center of the rear body panel and shall be at eye level to the operator. The leveling device shall be color coded indicating the following conditions:

- Green Safe operating zone.
- Yellow Caution operating zone.

Since use of this leveling device is of a critical nature, it shall have a serialized number from its manufacturer to indicate documented quality control.

TURNTABLE

The existing turntable shall be removed from the torque box and shall be modified to accept the new style swivel. Turntable bearing shall be removed and the turntable shall be sandblasted, inspected, primed and painted specified color. Turntable bearing shall be tested and re-installed if within specs utilizing new hardware with verified torque value. Turntable heel pin area shall be inspected for excess wear. The fire department will be notified for repair approval if line bore and sleeve repair is needed. The rotation motor assembly shall be replaced with a new assembly. The transmission shall include a new brake assembly and the hydraulic drive motor will be replaced with a new current design White/Rodgers unit used on new apparatus that is quieter. Also installed shall be a pre-charged accumulator system to keep back pressure on the rotation hoses to aide in keeping hydraulic flow from pulsating coming out of the motor thus resulting with smoother rotation operation.

If upon inspections the ladder heel pin, turntable bearing, or heel pin surface line bore/sleeve are in need of replacement, the fire department shall be contacted for approval.

The turntable deck will be a free from obstructions as possible, due to the importance of this area when the vehicle is in a rescue mode. The turntable deck will allow easy access to the turntable even when the ladder is being operated over the rear of the vehicle.

Turntables with the drive motor or breathing air bottles mounted in any walking areas (front or rear) of the turntable will not be acceptable.

CRADLE ALIGNMENT INDICATOR ARROWS

Stainless steel arrows shall be provided on the turntable surface in view of the operator when standing at the turntable control station. The arrows shall assist the operator in indicating the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be overlaid with ScotchLite material. This arrow alignment system shall be in addition to the cradle alignment indication on the MD3 display module.

TURNTABLE MANSAYER BARS

Two (2) Fire Research model #MS11A- 34, "ManSaver" safety bars shall be provided at the turntable handrail opening at the rear of the turntable. The "ManSaver" bars shall be padded with yellow vinyl covers that shall open in two (2) directions, in and up to provided additional safety at the turntable walking areas. The safety bars shall be mounted to the turntable handrails with MS22 mounting brackets.

HYDRAULIC, ELECTRIC AND WATER SWIVEL

Hydraulic power to the turntable hydraulic circuits shall be provided through a two (2) port, high pressure, hydraulic swivel that permits 360 degrees of continuous turntable rotation.

Electrical power to the turntable electric circuits shall be provided by a collector ring assembly. The collector rings shall be used for electrical ground, ladder control functions, and a 120 volt A.C. system during 360 degrees of continuous turntable rotation. The collector ring assembly shall have a minimum of **32** circuits.

Water shall be transferred to the aerial waterway by means of a five (5) inch water swivel enabling 360 degree continuous rotation of the turntable.

ROTATION ENCODER

The swivel shall be designed with an integral absolute encoder to provide a continuous output indicating the position of the turntable at any given time. The encoder shall be designed to indicate position of the turntable even if power interruption occurs. The number of degrees of rotation shall be shown in a digital readout on the MD3 display.

AERIAL LIFT CYLINDERS

The aerial lift cylinders shall be removed and overhauled including new seals and holding valves, then repainted. A drift test shall be done after the repairs. Drift test results shall meet the original equipment manufacturer's specifications.

LADDER EXTENSION CYLINDERS

The ladder extension cylinders shall be removed and overhauled including new seals and holding valves. The pistons for extension cylinders shall be re-grooved to accept a newer type red seal used for older extension cylinders. A drift test shall be done after the repairs. Drift test results shall meet the original equipment manufacturer's specifications.

LADDER INTERLOCK SYSTEM

A limit switch at the aerial travel support shall be provided to prevent operation of the outriggers once the aerial has been elevated from the nested position. This system must prevent operation of the outriggers once the ladder has been elevated from the nested position.

INCLINOMETER

An inclinometer shall be provided on the base section of the aerial device to measure the relative angle of the ladder.

ELEVATION FEATHERING

Controlled by the IQAN motion control system, the elevation system shall be design utilizing computer control technology to provide ramped, feathering cushioning for the elevation system at the end of cylinder stroke when controlled from the platform. The system shall automatically feather the movement of the ladder when the ladder approaches full elevation, regardless of the input speed from the platform or turntable controllers.

LOAD METER

The IQAN motion control system shall incorporate an integral load meter, which shall display load level on the aerial ladder and platform proportionate to the maximum-rated low elevation load of the device. The load meter shall calculate the current load and display it on the MD3 displays located at the turntable and the platform control console. The display instantly adjusts to changes in ladder angles, extension or live load.

The load meter system shall include:

- A pressure transducer installed in the hydraulic system. The pressure transducer is to have an accuracy of $\pm 1\%$.
- Bar Graph indicating moment load range.
- Actual percentage of moment load range.
- An audible horn mounted near the display.

ROTATION SYSTEM

A minimum 48.25" internal tooth monorace bearing shall be provided for smooth 360 degree continuous rotation of the aerial device. The upper inside half of the bearing shall be bolted to the open base support plate with sixty-four (64) 7/8" diameter grade 8 bolts, and with conical compression high strength washers to insure that the bolt is locked into the threaded hole. (Bolts designated as 8.2012 L-9 are not acceptable).

Both upper and lower bearing surfaces shall be milled to ensure a true mounting surface for the rotation bearing. Units that weld the bearing to their mounting plates shall not be acceptable due to the tremendous cost and down time involved in replacing a damaged or defective bearing.

******The original bearing will be used. The bearing will be tested prior to disassembly. If the bearing is not up to specifications, it will be remanufactured.******

ROTATION MOTOR AND BRAKE

A planetary drive speed reduction gear box powered by a hydraulic motor shall provide precise rotation control throughout 360 degrees of rotation. An automatic spring applied hydraulically released disc type brake shall be incorporated into the gear box to provide positive braking and holding the turntable/ladder against reactionary forces such as water and gravity. The drive motor shall be positioned on the turntable so it shall not obstruct any walking area or stepping surface on the turntable deck.

******The original rotation motor and brake shall be used and modified as per previous turntable specifications.******

E-SPEED™ SAFETY SYSTEM

The rotation system shall be controlled from the platform utilizing E-Speed™ technology, which shall automatically control platform rotation speed, proportional to the extension and elevation of the ladder. The E-Speed™ safety system shall automatically maintain the rotation angular speed regardless of the degrees of elevation or extension of the ladder, providing safer low angle operation and precise positioning control. The E-Speed™ safety system shall be controlled by the IQAN control system.

E-ZONE™ ROTATION SAFETY SYSTEM

The E-Zone™ Rotation Safety System has been designed to aid the aerial device operator who has primary operational responsibility in preventing the rotation of the aerial device into an over turning mode. Controlled by the IQAN system, the E-Zone™ Rotation Safety System senses outrigger extension and outrigger jack positioning in conjunction with the aerial device movement.

If the aerial device operator attempts to move the aerial device off vehicle center, and the outriggers are not fully extended on the direction of the rotation side, and all jacks in firm ground contact, the E-Zone™ Rotation Safety System shall sense this fault and shall audibly and visually warn the operator to return the aerial device to the center line position. If the operator continues rotation into the short-jacked zone, the aerial device rotation shall stop. When rotation is stopped, the E-Zone™ Rotation Safety System shall allow the operator to only rotate back to the fully jacked side of the vehicle.

E-ZONE™ CAB PROXIMITY SYSTEM

Controlled by the IQAN system, a cab proximity system shall be provided utilizing E-Zone™ technology on the rotation and elevation systems to alert the aerial device operator when rotating left or right at low angles and or lowering the ladder, toward the vehicle cab. The E-Zone™ system shall also automatically stop rotation or lowering functions when the device is in the defined zone regardless of the ladder rotation degree or elevation degree. When the E-Zone™ system stops rotation towards the cab, the operator shall only be capable of rotating in the opposite direction or elevate the ladder above the defined zone. If the E-Zone™ system stops the lowering function when the ladder is in the defined zone over the cab, the operator shall only be capable of raising or rotating the ladder away from the cab. The E-Zone™ system shall sound an audible alarm and display a warning message in the MD3 display located at the control stations. The audible and visual warning message shall stay activated until the operator moves the device from the defined zone.

E-ZONE™ BODY PROXIMITY SYSTEM

Controlled by the IQAN system, a body proximity system shall be provided utilizing E-Zone™ technology on the rotation and elevation systems to alert the aerial device operator when rotating left or right at low angles and or lowering the ladder, toward the body. The E-Zone™ system shall also automatically stop rotation or lowering functions when the device is in the defined zone regardless of the ladder rotation degree or elevation degree. When the E-Zone™ system stops rotation towards the body, the operator shall only be capable of rotating in the opposite direction or elevate the ladder above the defined zone. If the E-Zone™ system stops the lowering function when the ladder is in the defined zone over the body, the operator shall only be capable of raising or rotating the ladder away from the body. The E-Zone™ system shall sound an audible alarm and display a warning message in the MD3 display located at the control stations. The audible and visual warning message shall stay activated until the operator moves the device from the defined zone.

EXTENSION SYSTEM STRING POTENTIOMETER

An extension string potentiometer shall be provided on the aerial device to measure the relative extension of the aerial device.

E-CUSH™ EXTENSION/RETRACTION FEATHERING

Controlled by the IQAN system, extension/retraction system shall be designed utilizing E-Cush™ technology to provide feathering cushion for the extension and retraction at the end of cylinder stroke. The E-Cush™ system shall automatically feather the movement of the ladder when the ladder approaches full extension or full retraction, regardless of the input speed from the operator.

LADDER SLIDE MECHANISM

Nylatron slide pads with a sliding coefficient of friction of .15 shall be used between the telescoping ladder sections. Slides are required because of greater surface area for load transfer between the telescoping sections. Slide pads shall also be used to control side play between the ladder sections.

Ultra-high molecular weight material is not acceptable because:

- Load bearing characteristics are poor.
- Resistance to tearing is poor.
- Recovery to original shape is poor.
- It does not maintain a low coefficient of friction which causes unsmooth ladder operation.

LADDER EXTENSION NUMBERS

ScotchLite numerals shall be furnished on the inside of the ladder base section handrail, each side, to help the operator determine the distance the ladder is extended. The numbers shall read in five foot increments.

LADDER ANGLE INDICATOR

One (1) Rieker 12 volt lighted, ladder angle indicator shall be provided on the base section of the ladder, near the turntable control console. The integrated light shall be activated with ladder power.

ELECTRIC AIR AND HYDRAULIC ROUTING SYSTEM

All lines to the platform shall be enclosed and protected from the turntable to the platform. All lines shall be routed through the base section side rails and then through flexible aluminum conduits that travel under and over the mid-section and end at the base of the fly section.

Ladder designs where electrical lines, air lines and hydraulic line are exposed on the interiors of the ladder handrails shall not be acceptable.

PLATFORM CONSTRUCTION

The platform shall be constructed of five assembly groups:

Platform framework, handrails, corner gates, access gate/access ladder and floor.

******The original platform shall be used******

PLATFORM FRAMEWORK

The support structure framework of the platform shall be constructed of extruded square aluminum tubing. The floor of the platform shall be constructed of extruded aluminum tube extrusions covered with aluminum tread plate. An aluminum structure shall be provided below the platform floor structure to provide a structural attachment point for the platform to the ladder section.

******The original platform framework shall be used******

PLATFORM HANDRAIL ASSEMBLY

A continuous, unbroken handrail shall be provided on all four sides of the platform. The handrail shall enclose an area of the floor 37.5" long x 85" wide (20.8 square feet). The handrails on the front corners shall be mounted at the same angle as the platform floor for a uniform front and side step area.

A 4" kick plate shall be provided near the floor at perimeter of the handrail assembly.

******The original platform handrail assembly shall be used.******

PLATFORM ACCESS GATES

Two (2) self-closing access gates shall be provided for entry into the platform. They shall be provided at the front corners of the platform and shall not interrupt the top safety rail. Both gates shall be hinged at the rear and shall swing inward. Each gate shall include automotive type safety latches. Each gate shall be designed utilizing 2" X 2" tubing, which shall incorporate an integral handrail in the top section of the door. The integral handrail shall be constructed from 1-1/4" round aluminum tubing that shall be knurled anti-slip material. The gate hinges shall be a two-point type hinge to eliminate binding associated with a piano type hinge.

*******The original access gates shall be used*******

PLATFORM ACCESS LADDER AND HANDRAILS

Continuous ladder contact between the platform and the ladder fly section shall be maintained by attaching a sliding auxiliary ladder section to the platform that shall follow the platform as it moves away from the ladder during elevation.

Handrails shall be provided between the ladder fly section and the platform that automatically position themselves for maximum protection for transfer to or from the platform no matter what the ladder's angle of elevation.

The main entrance between the ladder and platform shall be located at the rear. The rear gate shall be 2.25" diameter round tubing, mounted to a two position spring loaded hinged, which shall give the gate the capabilities of being lifted up 90° or up and in 90° into the platform. When the rear gate is in the closed position, it shall rest in a socket type receptacle located on the rear main handrail structure of the platform. The rear gate shall be equipped with a mechanical pin to secure the gate in a fixed position.

*******The original components shall be used.*******

PLATFORM FLOOR

The floor of the platform shall be constructed of extruded aluminum tubing covered with anti-slip aluminum tread plate.

The floor assembly shall be one piece and shall extend out past the front gates 8.75" on each side, making transfer of personnel in and out of the platform easier. The floor size shall be a minimum of 55" x 85", for approximately 29.5 ft² of floor area.

The platform floor and the outside platform step shall be on the same level. All corners of the floor shall be beveled to facilitate close maneuvering to buildings. There shall be a heavy-duty extruded rubber bumper on the outside edge of the platform floor. The bumper shall be the same thickness as the floor material and shall be equipped with molded end caps to ensure uniform edges.

The underside of the platform shall be protected by the solid aluminum tread plate with the exception of the four (4) drain holes. By having a floor with solid construction, protection against direct contact with heat radiation shall be provided.

Platform floors that are not constructed from solid material shall not be acceptable.

*******The original platform floor shall be used.*******

PLATFORM FLOOR OVERLAY

The platform floor shall be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, non-slip coating. The flooring shall be secured utilizing a Silyl Modified Polymer (SMP) based adhesive and shall be easily replaceable should the flooring become damaged.

The entire perimeter of the platform floor shall have a minimum of 2" of photo luminescent coating. The flooring provides an aggressive, non-slip coating and assists in providing a light source for the platform during low light conditions. The photo luminescent coating shall remain visible for up to 20 hours after exposure to light.

******The original platform floor shall be used******

PLATFORM MOUNTING

The platform shall be suspended from the tip of the fly section by an integral "cradle" shaped assembly that supports the platform beneath the center axis of the floor. The cradle design shall transfer all platform loads directly to the ladder structure. The "cradle" platform mount shall also insure that forces shall not be transferred through the platform structure when the platform is positioned on the ground or on a building roof. This support assembly shall not hang below the top of the windshield and shall not obstruct the driver's view.

The support structure will be designed to withstand the forces created by the vehicle when it encounters road irregularities. Hydraulic cushioning in the platform leveling system is not acceptable at KME because fluids locked inside the cylinders by the holding valves do not allow adequate dampening.

Two (2) heavy duty rubber bumpers shall be provided on the platform cradle supports, one (1) each side. The rubber bumper shall be positioned so it is the only component touching the building or ground depending on ladder position.

PLATFORM LEVELING SYSTEM

A platform leveling system shall be provided and so designed that the platform together with its rated payload can be supported and maintained level in relation to the turntable regardless of the elevation of the ladder.

The leveling of the platform shall be accomplished by the following two systems working together:

- **Master/Slave Cylinders** - A dual master/slave hydraulic cylinder system shall be provided with each side capable of maintaining the platform level. Two (2) master cylinders shall be mounted between the turntable and base ladder section and two (2) slave cylinders shall be mounted between the fly section and the platform. As the ladder is raised or lowered, hydraulic fluid shall be transferred between the master and slave cylinders thus maintaining the platform level. Steel tubing and heat resistant flexible hydraulic lines shall be provided between the master and slave cylinders. The slave cylinder seals will prevent oil leakage which might allow the platform to go out of level by itself during prolonged periods of inactivity of the aerial device.
- **Auto Leveling** - An automatic inclinometer level sensing device located in the platform shall also be provided to further ensure the platform is maintained level regardless of the elevation of the ladder or vehicle position.

The following safety features shall be provided in the leveling system:

- The 2" basket pivot shall be mounted under the center of the basket. This shall provide lower operating pressure in the leveling system.

- The slave cylinders shall be mounted outside of the platform for maximum platform space utilization and safety for personnel from moving cylinders.
- Holding valves shall be provided on the slave cylinders to prevent the platform from tipping should any hydraulic leveling line be severed.
- Heat resistant flexible hydraulic lines and steel tubing shall be provided between the master and slave cylinders.
- The platform and platform loads shall be directly supported by the ladder section.
- The leveling cylinder system shall not be required to support the platform or platform loads when in aerial operation or travel position.
- Due to the platform being supported by the ladder section, the leveling system shall operate at much lower pressures providing smoother leveling and less general maintenance to the system.

PLATFORM FLOOR HEAT SHIELD

The underside of the platform floor shall be covered with 0.090" polished aluminum tread plate. The heat shield shall be designed to enclose the platform waterway pipes, electrical junction boxes and any hoses or wires. The heat shields shall also provide mounting surfaces for quartz lights and warning lights. The center section of the heat shield shall be hinged to allow easy access to the components mounted under the platform floor.

******Aluminum tread plate on the underside of the floor is not applicable due to the design of the existing platform. Aluminum tread plate shall be provided on the floor of the platform.******

PLATFORM COVERING

The front, sides and doors of the platform shall be covered with 0.090" painted aluminum. The color of the heat shield shall match the ladder job color paint.

******The existing stainless steel panels will be replaced with painted aluminum panels. The bottom will remain aluminum tread plate.******

SAFETY BELT LOOPS

Four (4) forged steel eyebolts shall be provided in the platform. The eyebolts shall be located as follows; one (1) near the platform operator's station, one on the left side of the platform and two (2) shall be located on the front of the platform.

LIFTING POINTS

Two (2) 3" diameter lifting points shall be provided under the platform, which shall be attached directly to the platform support arms. This design shall ensure the loads implied on the lifting points shall be directly supported by the ladder structure and not transferred to the platform framework or the platform leveling system.

******The original lifting points will be used.******

PLATFORM PAINT

The front, sides and doors of the platform shall be painted to match the ladder job color paint.

******* PLATFORM 120 VOLT ELECTRICAL SYSTEM & ACCESSORIES *********PLATFORM 120 VOLT SYSTEM**

Two (2) 120 volt 20 amp electrical circuits utilizing 12 gauge five strand electrical cable shall be provided to the platform. Circuits shall be wired from the platform to the turntable through the collector ring assembly.

PLATFORM 120 VOLT RECEPTACLES

Two (2) 120 volt, NEMA 5-15R, 15 amp, duplex straight blade receptacle with weatherproof covers shall be provided. They shall be installed one (1) on each side near the rear of the platform on the vertical supports.

Both receptacles shall require one (1) 15 amp, 120 volt circuit breaker to be installed in the load center.

FRONT OF PLATFORM RECESSED LED LIGHT

One (1) 155 watt Fire Research "Spectra" model #SPA260-K15, 155 watt, 120 volt LED light shall be recessed on the front center of the of the platform. The light shall be adjusted to illuminate the front of the platform without blinding the operator.

The light shall be wired to the breaker panel and shall be switched from the following location(s):

- Platform Console
- Turntable Console
- Cab Dash

The control switches shall be wired through low voltage relays to maintain 12 volt circuits in the cab and allow for 3 way switching.

BOTTOM OF PLATFORM RECESSED LED LIGHT

One (1) 155 watt Fire Research "Spectra" model #SPA260-K15, 155 watt, 120 volt LED light shall be recessed on the bottom center of the platform. The light shall be adjusted to illuminate the underside of the platform without blinding the operator. The light shall be wired to the breaker panel and shall be switched from the platform console.

******* PLATFORM 12 VOLT ELECTRICAL SYSTEM & ACCESSORIES *********PLATFORM 12 VOLT CIRCUIT**

All 12 volt electrical lines to the platform shall be enclosed and protected from the turntable to the platform. All 12 volt electrical lines shall be routed through the base section rails and then through flexible aluminum conduits the travel under and over the mid-section(s) and end at the base of the fly section.

Platform designs where electrical, air, or hydraulic lines are exposed on the interiors of the ladder handrails shall not be acceptable.

TURNTABLE HEEL PIN STEP LIGHTS

Seven (7) Innovative Lighting 3-LED, chrome plated, surface mounted step lights shall be installed at the base of the ladder in the turntable heel pin step.

TURNTABLE CONSOLE STEP LIGHT

One (1) Innovative Lighting 3-LED, chrome plated, surface mounted step light shall be installed the front face of the turntable console facing the operator, to illuminate the step area in front of the control console. The light shall be mounted no lower than 18" from the step deck.

PLATFORM CONSOLE STEP LIGHT

One (1) Innovative Lighting 3-LED, chrome plated, surface mounted step light shall be installed on the front face of the platform control console facing the operator, to illuminate the step area in front of the control console.

PLATFORM AND TURNTABLE CONSOLE LIGHTING

A sealed 12" Amdor Lumabar LED H2O light shall be used to illuminate the platform and turntable control consoles. The light shall be mounted across the top of the control panel to assure proper illumination of all controls.

The light shall be wired to the ladder power circuit.

LUMA BAR PATHFINDER (TM) AERIAL ILLUMINATION SYSTEM

The ladder sections shall be equipped with the Luma Bar Pathfinder (TM) aerial illumination system. This system shall illuminate the rungs of the ladder to support night time operations.

The Luma Bar Pathfinder (TM) system shall consist of a continuous path of red SMD LED lights spaced every 3/4" which shall offer a minimum viewing angle of 120 degrees. The assembly shall be encapsulated within an enclosure which is resistant to UV and ozone and shall be terminated using sealed end caps with RTV silicone. The complete assembly shall offer a minimum waterproof rating of IP68. This sealed enclosure shall be mounted within a clear anodized aluminum C-channel on the inside of the rung base rail, on each ladder section.

The Luma Bar Pathfinder (TM) assembly shall incorporate a UV stabilized high impact polycarbonate shield which is integral to the supplied aluminum C-channel. The Luma Bar Pathfinder (TM) system shall be wired to the ladder power circuit with a disabling switch at the turntable control console.

MARKER LIGHTS

Five (5) Truck-Lite amber LED marker lights shall be mounted on the front of the platform.

BASE SECTION LIGHTS - 12 VOLT

Two (2) Unity spotlights shall be mounted at the rear of the base ladder section, one on each handrail. The lights shall be equipped with a swivel base and an on/off switch on the light head itself.

PLATFORM LIGHTS - 12 VOLT

Two (2) Whelen PAR-46, model #P46FLC super LED work lights shall be mounted on the front of the platform handrail, one on each side. Each light shall have twelve (12) LED's, pedestal mount, chrome rear cover, removable "T" handle and a built in on/off switch.

PLATFORM WARNING LIGHTS

Four (4) Whelen M6* super LED lights shall be provided on the platform in order to comply with NFPA-1901 Optical Warning Devices when the platform is cradled. Two (2) of the lights shall be located on the front face of the platform floor structure and two (2) lights shall be located on the side of the platform, one (1) each side. The lights shall be activated with the warning light and ladder power circuit.

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

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

Two (2) Whelen M6 red LED warning lights shall be provided on the side of the platform sheet. Two (2) of the lights shall be located on the side face of the platform structure. Each light shall be equipped with a red lens. The lights shall be activated with the warning light and ladder power circuit.

CONTROL STATIONS

There shall be two (2) control stations. One shall be known as the platform control station and the other shall be known as the turntable control station. All elevation, extension and rotation operational controls shall operate from both of these positions. These controls shall be arranged to permit the operator to regulate the speed of these operations within the safe limits as determined by the manufacturer. The control devices shall be grouped in an identical manner at both stations for similarity of operation and to meet NFPA-1901.

Platform load instruction plates shall be located at both control stations to indicate the recommended safe load of the platform. The control devices shall be clearly marked and suitably lighted.

The controls shall be so designed to allow the turntable control station to override the platform controls even if the ladder is being operated by the platform controls.

The turntable control station shall be located on the left side of the turntable such that the operator can easily observe the platform while operating the controls.

TURNTABLE CONTROL STATION

The lower part of the console shall be angled away from the operator, to provide as much foot room as possible for the operator.

An access door shall be provided on the front of the console to provide complete access to the electrical and hydraulic components mounted inside the console.

The console shall be illuminated for night operations, and shall have the following controls/indicators:

The following items shall be clearly marked:

- IQAN, MDIII display
- Three (3) ladder/platform control levers
- A foot operated "dead man switch" that electrically opens the aerial control valve shall protect against accidental movement of the control handles.
- Master electrical power switch with emergency shutdown capabilities.
- Rung alignment indicator light for ladder climbing operations.
- Cradle alignment indicator light.
- Engine fast idle control switch.

- Emergency pump power switch.
- Keyed platform leveling switch
- 5,000 PSI hydraulic pressure gauge (liquid filled)
- Intercom controls
- Illuminated load chart on front of console
- Air horn control button
- Aerial hourmeter
- Control switch for the front of platform LED flood light
- Flowmeter for aerial waterway

*****The current turntable console shall be modified and re-surfaced to accept the upgraded controls. Included shall be a swinging door with latch for easy access to manual aerial controls as well as electrical and hydraulic components. The master controls shall include three (3) electronic joysticks for aerial movements. A "dead man" foot switch shall be provided for aerial operations, turntable foot switch activation will override the platform controls. The MD3 display for the IQAN system shall be flush mounted in the upper panel where it will be easily accessible by the operator. Indicator LED's shall be provided for "rung alignment", "emergency override", "warning & cradle alignment".**

*****Water monitor controls shall be provided for each electric monitor for operation from the turntable. The specified intercom system control shall be mounted so it is easily accessible by the operator.*****

- Control switch for the front of platform quartz flood light

FIRE RESEARCH FLOWMETER & PRESSURE METER

The apparatus shall be equipped with a Fire Research flow and pressure meter "FPA400", at the turntable console which shall give the operator or engineer an indication of actual volume of water (in gallons) being discharged through the aerial waterway. The display shall also be capable of showing discharge pressure without the need of pushing any buttons.

The display case shall be constructed on non-glare black anodized aluminum, with bright red LCD digits to indicate flow, and a bright analog pointer to indicate pressure. A calibration slot shall be provided on the rear face of the display to make field calibration easy.

A flow sensor paddle wheel shall be installed on the discharge piping with a machined housing or clamp.

A pressure transmitter (transducer) mounted in the discharge piping. The pressure transducer shall be installed downstream from the discharge valve to indicate pressure only when the valve is open.

TURNTABLE CONSOLE COVER

The turntable control console shall be designed with a painted aluminum cover. The cover shall be designed with a radius shape that pivots over the top of the control panel and does not obstruct viability for the operator when the ladder is operated at low angles. The cover shall be painted to match the color of the ladder.

*****A "flip-over" style cover similar to the existing cover shall be provided and modified as needed to house the current controls. The turntable console cover as specified is not applicable without changing the console.*****

PLATFORM LADDER CONTROLLERS

Three (3) ladder directional controllers shall be mounted on the platform control console. They shall control extend/retract, rotation, and elevation. These controllers are part of the motion control system allowing safe operation of the ladder from the platform.

The controllers shall incorporate ICB; J-1939 can bus signaling, transmitted through two (2) J-1939 communication wires to reduce the chance of electrical failures since fewer wires and terminals shall be utilized. Additionally, voltage sensitivity is eliminated thus providing superior motion control. Joystick controllers that utilize potentiometers or mechanical switches to control motion shall not be acceptable.

PLATFORM CONTROL CONSOLE

The platform control console shall be located at the right side rear of the platform to provide maximum room on the platform and to allow the operator to see around the platform and the ladder sections at the same time.

An access door shall be provided on the front of the console to provide complete access to the electrical and air system components mounted inside the console.

The following controls shall be located on or near the illuminated console:

- Motion Control MD3 display
- Operator "dead man" switch. That electrically opens the aerial control valve shall protect against accidental movement of the controls handles.
- Extend/Retract Control Lever
- Elevation Control Lever
- Left/Right Control Lever
- Cradle Alignment Indicator Light
- Fast Idle Control Switch
- Rung Alignment Indicator
- Panel Light/Power Switch
- Illuminated Load Chart
- Painted Aluminum Console Cover

COMMUNICATION SYSTEM

A Fire Research communication system shall be furnished between the platform and the turntable operator's position. A master control at the turntable operator's console shall be provided, with a push-to-talk button and a volume control.

A self-contained, hands-free speaker microphone shall be located in the platform. No operator action shall be required to transmit or receive messages at this speaker microphone.

LADDER ANGLE INDICATOR

One (1) Rieker model # 4120, 12 volt lighted, ladder angle indicator shall be provided on the fly section of the ladder, visible from the platform control console. The integrated light shall be activated with ladder power.

BREATHING AIR SYSTEM

A breathing air system shall be furnished which shall include two (2) 4500 psi, 444 (total 888) cubic foot DOT air cylinders, mounted on the side of the ladder base section in accordance with federal DOT practices. The cylinders shall be on the opposite side from the turntable control console.

The breathing air system shall be "pre-piped" from the turntable to the platform using a Kevlar reinforced synthetic air hose. Air from the cylinders shall be routed through the lower regulator to be reduced from cylinder pressure to airline pressure and then travels up and through the ladder sections to the platform control console. The air is then routed through an inline air filter and regulator located in the platform.

Four (4) quick disconnects with plugs and retaining chains shall be located in the platform. The air couplings shall be matched to the type required by the Fire Department.

There shall be a quick coupling at the turntable console for easy refilling of the breathing air system without disturbing the air bottles.

A fifty foot (50') refill hose shall be provided as loose equipment with this system for recharging the air cylinder.

The breathing air couplings shall be Schrader or Hansen type coupling to match the Fire Department's air system.

Two (2) Scott, model "AV-2000" 804386-19, positive pressure respirators shall be provided for the breathing air system.

AIR MASK STORAGE LEFT SIDE

One (1) aluminum tread plate air mask storage box with positive latching hinged lid shall be provided at the left rear outside of the platform. The box shall be large enough to store two (2) air masks with extension hoses.

The motion control system shall monitor the breathing air level and display a message indicating air level on the MD3 displays. A low breathing air alarm shall be provided in the air line downstream from the high pressure regulator, which shall activate a 95 DB fast pulse alarm mounted at the turntable and platform control stations if the breathing air pressure falls to or below the set percentages of the system capacity.

AERIAL WATER SYSTEM

The aerial waterway system shall be capable of being supplied by both a midship mounted pump (if required) and an external water source with the inlet on the rear of the apparatus.

The piping from the aerial discharge valve and the rear inlet to the turntable swivel shall be 5" stainless steel pipe. A 5" tee shall join the pump discharge line and the rear inlet line. A 5" water swivel shall be located in the riser pipe from the tee permitting 360 degree continuous rotation of the ladder.

An anodized aluminum telescopic waterway shall be mounted beneath the center of the aerial ladder. The waterway shall have a 5" base section tube, 4-1/2" mid-fly section tube, and a 4" fly section tube.

The waterway shall be secured to the ladder sections with cradle type mounts to provide a minimum of 2" of up and down movement in the waterway. This design shall protect the waterway from bending if the ladder comes in contact with a building or a water hammer is imposed to the waterway discharge.

A 5" double swivel piped waterway with 5" flex tube connection between the ladder waterway and the turntable swivel permitting water tower operations from -10 to +80 degrees.

An automatic drain shall be provided in aerial water way to automatically drain the system for freezing conditions. This valve shall also act as a vacuum relief valve for the waterway when extending the aerial device with the discharges in the closed position.

A 2-1/2" relief valve preset at 225 psi shall be located beneath the turntable to protect the water system from excessive pressures.

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

WATERWAY REAR INLET ADAPTER

The rear aerial inlet shall be equipped with a 4" NST adapter with long handle cap.

A Kochek 4" NSTF X 5" Storz SKE-R 30° adapter with cap shall be provided for the rear inlet.

NOTE: A 2.5" Class One pressure gauge shall be provided at the rear outrigger control panel of the vehicle to indicate waterway pressure.

The gauge shall be silicone filled pressure gauge to help with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

PLATFORM WATER SYSTEM - SINGLE MONITOR

A 4" water swivel located under the platform shall connect from the fly waterway to the platform waterway. The water swivel shall permit full operation at any elevation of the aerial device. One (1) 4" pipe shall be provided to transfer water from the swivel to the deck gun. The platform waterway pipes shall be formed tubing to reduce friction loss in the waterway.

All platform waterway piping shall be completely removable for service or replacement. Platform designs in which the waterway is welded or utilized for structural integrity of the platform shall not be acceptable.

One (1) 100 GPM shower nozzle shall be located beneath the platform for heat protection for platform personnel. Electronic valve controls shall be provided inside the platform.

PLATFORM MANUAL VALVE UNDER MONITOR - SINGLE

Task Force Tips VUM, model # AKP131441D manually controlled monitor valve {will/shall} be provided under the monitor. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. The unit shall have a flow capability of up to 2000 GPM with friction loss no more than 6 psi. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a silver powder coat internal and external finish. The valve ball shall be stainless steel and have an automatic drain for draining waterway when valve is closed and unpressurized. The unit shall have a unique serial number and be covered by a five-year warranty.



The valve shall be configured with a 4" ANSI 150 flange inlet and 4" ANSI 150 flange outlet. Ports C2, C3 shall have a 2 1/2 NH hydrant valve straight. C1, C4 shall have blind plugs installed. Valve shall have a drain. All 2-1/2" NH male discharges shall have a 2-1/2" NH female by 1-1/2" NH male thread reducer and a 1-1/2" NH female cap with lanyard.

*****Original discharges and reducers shall be used*****

Two (2) 2-1/2" x 1-1/2" reducers with caps shall be provided for the pre-connect discharges located at the front of the platform.

PREVENTATIVE MAINTENANCE & OPERATIONAL FAMILIARIZATION PROGRAM

An on-site program for familiarization of Fire Department personnel shall be provided. This program shall be designed to assure complete understanding of all aspects of the aerial device in the operating environment.

After the unit has been accepted, a factory qualified Field Service Technician shall be provided for a minimum of three (3) days of familiarization.

The familiarization program shall be designed to instruct the individual who has never utilized an aerial device of this type before. The individual shall be thoroughly demonstrated the operating systems of the aerial device, including emergency operation. Introductory service skills utilizing the vehicle shall also be demonstrated.

FAMILIARIZATION PROGRAM

To instruct Fire Department personnel in the operation, preventative maintenance and care of the aerial device, this familiarization program shall be oriented towards a hands-on approach utilizing the new apparatus.

- Review personnel level and determine specific familiarization requirements.
- Explain operations of the entire aerial device. Each participant shall actually use the aerial and be shown the necessary steps of safe operation.
- Troubleshooting shall be emphasized and reinforced continually throughout the familiarization period.
- Preventative maintenance procedures shall be setup and definite schedules developed to assure proper maintenance of the aerial device.
- Familiarization in the use of tools and how to replace minor assemblies, as applicable. Equally important in this familiarization shall be when to call appropriate personnel for assistance.
- How to order parts through the local service center by utilizing parts manual.

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SERVICE

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of downtime, KME maintains a network of service centers with factory trained personnel.

KME also has a separate facility for service of units so they do not conflict with production units. The service facility carries an inventory of parts, separate from production parts.

WARNING DECALS

Warning decals shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions. All warning labels shall be in general compliance with A.N.S.I. Z34.1 recommendations.

MANUALS

The aerial manufacturer shall provide the following manuals pertaining to the aerial device:

- Two (2) Operator's manuals
- Two (2) Parts manuals
- Two (2) Complete Electrical and Hydraulic Diagrams

MANUFACTURERS PROOF LOAD TEST PRIOR TO DELIVERY

In addition to all NFPA-1901 testing requirement the following test shall be conducted to the aerial device prior to delivery.

To ensure structural integrity and increased service life, a proof load test as described below shall be conducted on the aerial device prior to delivery of the finished unit. This test is necessary to verify the ladder's ability to withstand the weight, ice and wind loads specified. The test shall serve to reduce the effects of long term fatigue on the structure.

Additionally, a waterway pressure test shall be performed.

Upon completion of the preceding inspections, the independent testing company shall issue a Certificate of Inspection indicating that all specified standards have been satisfied. The Type I certification shall be provided by Underwriters Laboratories Inc. (UL). Aerial manufacturers not utilizing third party, independent testing companies shall not be acceptable.

******Specified testing is not applicable for a refurbished apparatus.******

TESTS

The following test shall be conducted to the aerial device prior to delivery. All listed tests shall be witnessed and certified by Underwriters Laboratories Inc. (UL) to ensure the device meets all requirements of NFPA-1901.

As the manufacturer of the aerial device, KME is required to provide a written statement signed by the Chief Engineer certifying the aerial's ability to perform the following tests:

- 1-1/2:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the ladder sections and platform are so designed and powered to support a load representing 150% of the manufacturer's rated payload capacity at maximum horizontal reach on level ground. Since this is a dynamic test, the load will be raised, lowered and rotated without evidence of instability. Specifically, 1500 pounds in the platform with the ladder fully extended at zero degrees shall be rotated 360°.
- 1-1/3:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the tip and ladder sections and platform are so designed and powered to support a load representing 133% of the manufacturer's rated payload capacity at maximum horizontal reach on a five (5) degree slope. Since this is a dynamic test, the load will be raised, lowered and rotated without evidence of instability. Specifically, 1333 pounds in the platform with the ladder fully extended at zero degrees shall be rotated 360°.
- TIME TEST - A test of the apparatus shall be performed to raise the platform from a bedded position extended to full height and rotated through a 90° turn smoothly and without undue vibration in not over 150 seconds.
- WATER TOWER TEST #1 - A test of the apparatus shall be performed to test its ability to discharge 1000 gallons per minute parallel to the ladder with the unit at full extension and zero degree elevation and through a 360° rotation. The unit shall be capable of performing this test with a payload of 500 pounds at the platform.
- WATER TOWER TEST #2 - A test of the apparatus shall be performed to test the ability to discharge 1000 gallons per minute, 90° to the ladder with the ladder at full extension, zero degree elevation and through 360° of rotation. The unit shall be capable of performing this test with a payload of 500 pounds at the platform.
- WATER TEST #3 - A test of the apparatus shall be performed to test the ability to discharge 1000 GPM above the ladder centerline and as many degrees above 0° as the deck gun design allows. This test shall also be performed with the ladder fully extended at 0° elevation and through 360° of rotation with a platform payload of 500 pounds.

Bidders must state their ability to comply with all of the above tests. Failure to do so shall be grounds for rejection of their bid.

****** PAINT SECTION ********PAINT, PREPARATION AND FINISH**

The PPG Delta, Low V.O.C., polyurethane finishing system, or equal, shall be utilized. A "Clear Coat" paint finish shall be supplied to provide greater protection to the quality of the exterior paint finish.

All removable items, such as brackets, compartment doors, etc. shall be painted separately to insure finish paint behind mounted items. All compartment unwelded seams exposed to high moisture environments shall be sealed using permanent pliable caulking prior to finish paint.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

BODY PAINT

The inside and underside areas of the complete body assembly shall be painted black, prior to the installation of the body on the chassis or torque box. The body paint finish will be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

COMPARTMENT PAINT

The interior of the compartments shall be finish painted job color with a scuff resistant webbing type paint of a contrasting color applied over the painted surfaces.

BODY PAINT

The body paint finish shall be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted job color to match the primary color of the body.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self-etching, and corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two components, polyurethane primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior shall be painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located approximately 3" below the cab side windows.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

CHASSIS PAINT

The chassis frame rails, suspension and axles shall be painted black with a Polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

WHEEL PAINT

The chassis wheels, (except aluminum wheels) shall be painted job color with silver trim around the perimeter.

AERIAL DEVICE PAINTING

Prior to any painting, all weldments such as the outrigger beams, torque box, turntable, and ladder sections shall be sand blasted, cleaned and inspected to insure the removal of any surface imperfections and to insure superior paint adhesion to the metal.

The entire painting system shall utilize a single manufacturer's paint for compatibility between primers and finished coats. All painting shall be done in atmosphere controlled spray booths. The weldments shall then be primed with Ditzler (PPG) Epoxy Primer. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the aerial unit shall be thoroughly cleaned, conforming to good painting practices.

The aerial components shall then be sprayed with Ditzler (PPG) Polyurethane primer sealer. Finished paint used on the turntable, lift cylinder, and ladder sections shall be painted Ditzler (PPG) Durethane Polyurethane #91528 white. The base rails of the mid-fly and fly section/s of the ladder shall be painted with hardcoat black paint.

The torque box shall be painted black, allowing easy touch-up after extended use.

The outrigger beams and the vertical jack shall be painted with Silver Urethabond 104 non-leaving aluminum urethane primer/finish, allowing easy touch-up after extended use.

LADDER CORROSION INHIBITOR

All internal surfaces of the ladder exposed to the atmosphere, i.e., inside base, mid and fly section side rails shall be undercoated prior to ladder assembly using Procyon Corrosion Inhibitor to prevent internal corrosion. The corrosion inhibitor will meet the Boeing BMS-3-29 specification and meet a 1500-hour salt spray test. Manufactures that do not rustproof the interiors of the ladder sections shall not be considered.

PAINT CODES

The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

Single Color: *TBD* *Paint Code#* *TBD*

- **SECONDARY PAINT COLOR**

Two/Tone Color: *TBD* *Paint code#* *TBD*

- **AERIAL DEVICE PAINT COLOR**

Device Color: *WHITE* *Paint Code#* *91528*

TOUCH-UP PAINT

One (1) pint of each, exterior, color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit shall be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing shall be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

**** LETTERING AND STRIPING ****

COMPUTER GENERATED LETTERING

The lettering and striping shall be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer shall employ a full time artist / designer to generate all lettering, decals, and striping to meet the requirements of the Fire Department. The artwork for the lettering and striping shall be kept on record by the apparatus manufacturer to allow for ease in duplication for the Fire Department.

LETTERING

Scotch-Cal with drop shadow lettering {will/shall} be provided. The lettering layout shall coincide with existing fire department lettering. Locations shall be determined prior to construction.

Lettering provided shall be 3" high. A maximum of sixty (60) letters shall be provided.

LADDER EXTENSION NUMBERS

Scotch-Lite without drop shadow lettering shall be provided on the inside of the ladder base section handrail, each side, to help the operator determine the distance the ladder is extended. The numbers shall read in five (5) foot increments. The side of the lettering shall be determined by the available space.

LETTERING FONT

The lettering shall be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

CUSTOM FIRE DEPARTMENT LOGO

A Maltese Crosses with customized accent appliques be provided and applied one (1) each side on the forward cab doors.

The custom logo shall be printed on Scotch-Cal with two computer generated printed colors.

The custom logo shall be located as directed by the Fire Department.

LARGE CUSTOM FIRE DEPARTMENT LOGO

A pair of custom made town seals or Maltese Crosses shall be provided and designed to match existing fire department layouts. One (1) seal shall be applied on each side of the cab door.

The custom logo shall be printed on Scotch-Cal with two computer generated printed colors.

The custom logo shall be located as directed by the Fire Department.

CORNER SCROLLS

Custom designed corner scrolls shall be provided and installed on the apparatus as directed by the Fire Department.

A total of eight (8) scrolls shall be provided and made with "Sign Gold" gold leaf material, which shall be equipped with a black border.

AERIAL LETTERING PANELS

Painted aluminum panels shall be furnished on each side of the aerial device base section. The panels shall be approximately 19" high X 144" long.

The sign panels shall be painted to match the aerial ladder paint color.

Scotch-Cal with drop shadow lettering shall be provided on the signboard per the fire department requirements. The design of the lettering on the signboard shall be designed with a maximum text height of 12" and fit in the available area

****** NFPA REQUIRED SCOTCH-LITE STRIPING ******

SCOTCH-LITE STRIPE

Dual four (4) inch high "Scotch-Lite" stripe {will/shall} be provided. The stripes {will/shall} be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout {will/shall} be determined by the Fire Department.

The Scotch-Lite shall be white in color.

A simple "Z" effect {will/shall} be incorporated into the dual 4" Scotch-Lite scheme on the body. Final layout of this configuration {will/shall} be determined by the Fire Department.

SCOTCH-LITE ACCENT STRIPES

Two (2) 3/4" high Scotch-Lite material accent stripe shall be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges. Final layout of this configuration {will/shall} be determined by the Fire Department.

PIN STRIPES

Two (2) 1/4" black vinyl pin stripes shall be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges. Final layout of this configuration shall be determined by the Fire Department.

STAY BACK SIGN

A reflective "Stay Back 500 Feet" sign with four (4) inch high letters shall be mounted on the rear of the vehicle as directed by the fire department.

REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

The striping shall be 6" Scotch-Lite.

The Scotch-Lite shall be Ruby Red #680-82 and Lemon Yellow #680-81 in color.



******* WARRANTIES & REQUIRED INFORMATION *******

WARRANTY - KME CHASSIS

The proposed vehicle includes a one (1) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of one (1) year from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

WARRANTY - ENGINE

The proposed unit will be equipped with a Fire Service rated engine, which will come furnished with a five (5) year Engine Manufacturer's warranty. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - TRANSMISSION

The proposed Allison transmission will be provided with a five (5) year warranty. A copy of the Allison transmission warranty will be supplied to the purchaser to define additional details of the warranty provisions.

WARRANTY - CUSTOM CHASSIS FRAME RAILS

The proposed KME custom chassis frame and cross members will be warranted for an unlimited time period. A copy of KME's frame rail warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - STEERING UNIT

The proposed Sheppard steering gear will be warranted for a period of three (3) years from the first date of service or 150,000 miles (241,401 kilometers), whichever occurs first. The product will be free from defects in material and workmanship under normal use in applications approved in advance by Sheppard.

WARRANTY - REAR AXLE

The Meritor axle will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.



WARRANTY - FRONT AXLE

The Dana (Eaton) axle/s will be provided with a five (5) year, 100K mile warranty. A copy of Eaton warranty will be supplied to define additional details of the warranty provisions.

WARRANTY - CAB STRUCTURE

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

BODY STRUCTURAL WARRANTY

The refurbished body shall be warranted against structural defects for a period of three (3) years.

The refurbished body shall be warranted against corrosion for a period of three (3) years.

WARRANTY - CORROSION

The cab shall be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

WARRANTY - PAINT - CAB

The proposed paint finish will be warranted for a period of seven (7) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - PAINT - BODY

A three (3) year fade and delamination warranty shall be provided for the paint finish on the refurbished body.

WARRANTY - REAR SUSPENSION

Hendrickson warrants suspension products manufactured by it to be free from defects in material and workmanship which occur under normal use and service for a period of three(3) years(base year + 2 years).

This warranty will not apply and no warranty of any kind will exist as to any product which has been subject to abuse, misuse, neglect, misapplication or accident of any type or cause or which has been repaired, replaced, substituted or used with parts other than genuine Hendrickson parts or altered by anyone.

WARRANTY - RUNG COVERS

The proposed composite fiberglass rung covers will be free from defects in material and workmanship for a period of 10 years.

The warranty above will apply to the products being subjected to foot traffic, for which they were designed. It will not apply when they are being subjected to heavy machinery, steel or plastic wheeled dollies, or to solvent cleaning.



AERIAL DEVICE STRUCTURE EXTENDED WARRANTY

The proposed aerial device weldment, including outriggers, torque box, turntable and ladder sections shall be warranted against loss of integrity or failure due to defects in material or workmanship for a period of five (5) years from the date of acceptance of the unit.

AERIAL WATERWAY WARRANTY

A one (1) year warranty shall be provided for the rebuilt aerial waterway.

WARRANTY - WATER TANK

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

PUMP WARRANTY

A one (1) year warranty shall be provided for the rebuilt Waterous pump.

WARRANTY - VALVES

A one (1) year warranty shall be provided for the rebuilt Akron valves.

WARRANTY - SEATING

HO Bostrom will warrant each new seat manufactured, to be free from defects in materials and workmanship when delivered to the original purchaser for a period of five (5) years.

Labor to remove or reinstall and transportation of defective items will not be covered by, or any allowance made for said cost under this warranty.

WHEEL ALIGNMENT

Wheel alignment shall be performed at Pro Align in Decatur, Alabama prior to the apparatus being delivered. The alignment shall be done with the truck fully loaded.

CONTINGENCY FUND

A contingency fund in the amount of \$5,301.09 shall be included for the purchase and installation of an AVCOM 6 position headset system. The AVCOM system shall be provided and installed by a local vendor during the final acceptance phase prior to the Purchaser taking possession of the apparatus.

LOOSE EQUIPMENT TO BE PROVIDED BY DEALER

- One (1) Tempest model EB-16-VSM electric positive pressure fan
- One (1) Streamlight FireBox E-Floor Vehicle Mount System (mounted)
- One (1) Streamlight FireBox E-Spot Vehicle Mount System (mounted)
- One (1) Amerex A411 20# ABC fire extinguisher (mounted)
- One (1) Amerex 331 15# CO2 fire extinguisher (mounted)



HUNTSVILLE FIRE RESCUE

One (1) Amerex 240 2.5 gallon pre-pressurized water extinguisher (mounted)

One (1) Denver tool leather bracket set--blade bracket and restrainer