

BID ADDENDUM NOTICE

07/31/2026

Bid Title:	Apparatus, 100 Rear Mount Aerial - FDNY		
Bid Number:	2600057 (EPIN 85726B0062)	Addendum #:	2
Bid Opening Date:	10/21/2026	Time:	10:00am EST
Procurement Analyst:	Christopher Likokas	Tel #:	(212) 386-0424 (CLikokas@dcas.nyc.gov)
Purchase Director:	Meline Hatchikian	Tel #:	(212) 386-0411

The following changes have been made to this bid:

Addendum No. 2

A "Transferring Data Between Rounds of an RFx" PDF Document has been added in Passport. Please refer to this document for information on how to transfer information from your previous RFx's submissions, if applicable.

Please see Passport for the link to the virtual Bid Opening via Microsoft Teams.

QUESTIONS / CLARIFICATIONS / REVISIONS:

- **Revision of Contract Item# 4:**
 - From: INSPECTION FEE (\$25,000.00)
 - **To: INSPECTION FEE (\$30,000.00)**
 - Please see revised C-pages below as well as the revised item grid in PASSPort.
- **Revision of FDNY Specification:**
 - FDNY has updated Section 25 of the contract specification to include revised requirements for the two-way radio portion of Item# 1. Please see the updated specification document below.

Bids are due electronically in PASSPort by 10/21/2026 at 10:00am EST. DCAS strongly advises vendors to finalize and submit bids at least **48 hours prior to due date and time**. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

All other terms and conditions remain the same.

DESCRIPTION

QUANTITY

UOI

UNIT PRICE

EXTENSION

CLASS/ZONE AWARD 01

THIS IS A CLASS AWARD.
YOU MUST BID ON ALL ITEMS IN THE CLASS TO BE
CONSIDERED FOR AN AWARD. IF YOU DESIRE TO BID
"NO CHARGE" ON AN ITEM IN THE CLASS YOU MUST SO
INDICATE.

ITEM NUMBER: 1.			COMM. C070 53
100FT REAR MOUNT APPARATUS, AS PER FDNY	1.		\$_____ \$_____
SPECIFICATION# 202702, DATED MAY 13, 2026.			

ITEM NUMBER: 2.			COMM. C070 53
SERVICE MANUALS, DIAGNOSTIC EQUIPMENT, PARTS	1.	LOT	\$_____ \$_____
BOOKS AND VIDEO AS PER FDNY SPECIFICATION#			
202702, DATED MAY 13, 2026 (SECTION 31.1).			

ITEM NUMBER: 3.			COMM. C070 53
TRAINING AS PER FDNY SPECIFICATION# 202702, DATED	1.	LOT	\$_____ \$_____
MAY 13, 2026 (SECTION 31.2).			

ITEM NUMBER: 4.			COMM. C070 53
INSPECTION FEE	1.	LOT	\$_____ \$_____

AN INSPECTION FEE OF \$30,000 IS TO BE INDICATED
AND ENTERED ON THE UNIT PRICE AND ON THE
EXTENSION LINES (ABOVE, TO THE RIGHT). THIS
INSPECTION FEE MUST BE INCLUDED AS PART OF THE
TOTAL VALUE OF THE CLASS.

TOTAL CLASS OR ZONE AWARD (ITEMS 1.00 THRU 4.00) 01\$_____

CASH DISCOUNTS

OFFERS OF CASH DISCOUNTS WILL NOT BE CONSIDERED
IN MAKING AN AWARD. PLEASE NOTE BELOW IF YOU
OFFER A CASH DISCOUNT AND, IF SO, THE DISCOUNT
TERMS.

DISCOUNT

YES NO TERMS % DAYS

FIRE DEPARTMENT CITY OF NEW YORK



100' REAR MOUNT AERIAL

DATED: MAY 13, 2026

SPECIFICATION PREPARED BY BUREAU OF SUPPORT SERVICES, FLEET SERVICES
DIVISION

SPECIFICATION SUPERSEDES ANY PREVIOUS SPECIFICATION FOR
100' REAR MOUNT AERIAL APPARATUS

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INTENT OF THIS PURCHASE:

It is the purpose of this specification to describe a 100' rear mount aerial apparatus. It will be front line apparatus and subjected to extensive use and the most severe service throughout the City of New York. It shall have the capability and capacity to carry a full equipment and personnel load. It shall be designed to carry supplies, material, equipment and personnel in a safe and secure manner. Travel height shall be as low as possible for this type of apparatus.

It is required that the prime vendor use materials, components and design practices that are the best available in the industry. The apparatus and its systems shall be designed and engineered to work properly under severe conditions and must perform its mission with a minimum amount of downtime. All components shall be selected to ensure maximum performance, service life, reliability and safety, not only to meet the minimum requirements of the specification.

Notice to Bidders

(Items listed in the notice to bidders shall apply throughout this specification)

1. It shall be the responsibility of the prime vendor to inform the FDNY of any errors or omissions in these specifications, for under this contract the prime vendor shall be held fully responsible for the design, performance, reliability and satisfactory operational function of the apparatus. Apparatus supplied under this contract shall comply with all applicable Federal, New York State and New York City regulations / laws in effect at time of manufacture.
2. **At the time of bid submission, the bidder shall have a minimum of five (5) years' experience in manufacturing emergency apparatus similar to that required by this specification.** It is not the intent of this specification to cover all details of design and construction. Nothing stated, implied or omitted from these specifications shall relieve the supplier from providing a finished product of high engineering design and workmanship, fully equipped and capable of performing its intended function.
3. Units shall be delivered complete and "ready for service".
4. It shall be the responsibility of the successful bidder to mount the unit, wire and install all accessories, paint, finish, and test the completed unit in accordance with the requirements of this specification.
5. Measurements and dimensions listed in this specification shall be defined as + / - 5% solely at the discretion and approval of FDNY.
6. **Pop-rivets, Riv-nuts, self-tapping screws or sheet metal screws shall not be used throughout this vehicle without the prior approval of FDNY. Attaching devices shall be approved by FDNY.**
7. All vendor-installed equipment and options are subject to FDNY approval with regard to equipment selection, placement / location and final installation.
8. If applicable, any OEM equipment removed shall be provided to FDNY upon delivery.
9. All indicator lamps throughout the apparatus shall illuminate only when that device is operational. Further details shall be discussed at the Preconstruction Conference.
10. If a component, option or feature specified in this specification is not available from the manufacturer, appropriate written documentation shall be provided by the prime vendor to FDNY stating that the specified component or system is not available through that manufacturer. FDNY shall approve any proposed substitutes to these components or systems.
11. On any item specified with a direct part number and/or name, the bidder may request to provide an "or equal". This request must be provided with documentation showing the replacement item meets or exceeds the specifications of the original item. The FDNY will then compare the product and have final approval.
12. If applicable, it is the intent of the FDNY to accept an apparatus with commercially rated components (e.g. tires, axles, suspension). If a specified component cannot meet the weight requirement as commercially rated, then a fire service rating may be acceptable. Proper documentation for fire service shall be provided from both the component manufacturer and the prime vendor. FDNY shall have final direction and approval on these components.

Notice to Bidders (Continued):

(Items listed in the notice to bidders shall apply throughout this specification)

13. If applicable, 304 series stainless steel shall be used on all unpainted and exposed surfaces. On all other surfaces 3CR12 series stainless shall be used. Further details shall be discussed at the Preconstruction Conference.
14. FDNY shall direct any areas of the apparatus that require padding to prevent personnel injury and/or equipment damage.
15. As deemed necessary by FDNY, protection for the undercarriage shall be provided in the form of ¼” thick minimum plate(s) to protect the apparatus and components from damage. These plates shall be installed at the discretion of FDNY. Further details shall be discussed at the Preconstruction Conference and subsequent inspection conferences.
16. Installation of all components shall be in compliance with all applicable laws and regulations pertaining to an apparatus of this type. The vendor shall supply written documentation of compliance upon FDNY’s request.
17. The apparatus described in this specification shall meet all necessary Federal OSHA requirements.
18. All efforts shall be made to save apparatus weight. Further details shall be discussed at the Preconstruction Conference. FDNY shall direct and approve the material type used in a given area.
20. Prevention of water intrusion is a critical concern for FDNY. As deemed necessary, and as applicable to the apparatus being offered, vents shall be extended on components including, but not be limited to the cab tilt reservoirs, transmission, axles, hydraulic reservoirs and fuel tank.
21. Due to the various chassis/body configurations and manufacturing processes available, further discussion may be necessary with regard to compartment and component layout. There shall be further discussion at the Preconstruction Conference as to any possible design changes. Due to the vast scope required in apparatus design, in-process changes may be required. This shall be discussed at subsequent inspection conferences. FDNY shall have the final determination on these matters.
22. All welding procedures shall be consistent throughout the entire build process.
23. As deemed necessary, metal covers shall be provided for equipment protection from damage and the elements. Further details of cover requirements shall be discussed at the Preconstruction Conference.
24. Manufacturer’s advertising/logos shall be as directed by FDNY.
25. All hardware properly “graded” and sized with self-locking nuts and / or caged nuts as approved by FDNY. The use of other grades may be acceptable with the approval of FDNY. In addition, if deemed necessary by FDNY, anti-vibration hardware shall be used in other critical areas. Loctite™ thread locker shall be used as directed by FDNY. In addition, Bostik “Never Seez”™ shall be used where directed by FDNY. Further details regarding hardware shall be discussed at the Preconstruction Conference.

Notice to Bidders (Continued):

(Items listed in the notice to bidders shall apply throughout this specification)

26. Linex™, or equal application “grit” shall be further discussed at the Preconstruction Conference. The UV protection shall be contained in the base stock--the use of an additive to attain UV protection is not acceptable.
27. This Department reserves the option to modify or reconfigure vehicles purchased under this contract for the express purpose of Research and Development. This Department may utilize this R&D Clause a maximum of 3 times throughout the term of the contract, inclusive of all contract renewals and extensions. The total value of the R&D Clause throughout the term of the contract, including all renewals and extensions, shall not exceed 5% of the contract’s registered value. Changes covered by this R&D Clause may involve the modification or the substitution of any component, as well as contingent equipment including, but not limited to, the drive train, body, sub-assemblies and supporting component hardware. These modifications and/or substitutions may also include changes to introduce new primary propulsion systems (i.e., Diesel, C.N.G., Hydrogen, Hybrid Power, etc.) to vehicles and equipment covered within the contract parameters. All terms and conditions used to govern the use of this R&D Clause will be dictated by the technological advances and innovations that take place, as they become available, within the primary industry of the contract and will be properly justified and quantified on each Purchase Order.
28. Critical fasteners shall be torque marked by the apparatus manufacturer. Further details shall be discussed at the Preconstruction Conference and inspections.

1. GENERAL REQUIREMENTS:

- 1.1 The entire apparatus shall be constructed using only new materials and accessories, complete and ready for operation. Apparatus delivered under this contract shall comply with all requirements of this specification. The cab, body and aerial ladder shall be manufactured by the OEM to facilitate inspections. Cab and body design are of critical importance to the FDNY. Both the cab and the body shall be custom designed to FDNY's requirements. The manufacturer shall modify their design as deemed necessary by FDNY to meet these requirements.
- 1.2 All parts and components not specifically mentioned, which are necessary to furnish such complete apparatus, shall conform to the best practices known to the automotive and fire apparatus industries in design, strength, quality of material and workmanship.
- 1.3 Units shall be manufacturer's latest, top-of-the-line design, highest quality, and modified, where necessary, to conform to these specifications. All surfaces shall be designed and manufactured to eliminate sharp edges and/or corners capable of producing an injury.
- 1.4 The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including a 100' aerial ladder and full complement of personnel shall be carried without damage to the apparatus. Weight balance and distribution shall be in accordance with recommendations of the National Fire Protection Association and current standard automotive practices.
- 1.5 Units shall comply with all applicable federal, state and city regulations, standards and laws relating to commercial vehicles and fire apparatus.
- 1.6 Assembly shall be designed to facilitate repairs, maintenance, servicing and lubrication.
 - All gauges, controls, and auxiliary appendages shall be properly labeled as directed by FDNY.
 - Location of undercarriage equipment shall have pre-approval of FDNY. Installation without such approval may require relocation.
- 1.7 All spare parts listed in these specifications shall be complete, modified if necessary and compatible with the apparatus contracted for. In the event that design changes/modifications are made, vendor shall be responsible for updating any spare parts that have been delivered prior to change.
- 1.8 Units shall be diesel powered, with automatic transmission.

1. GENERAL REQUIREMENTS (CONTINUED):

1.9 The completed apparatus shall comply with the following dimensions:

ITEM	DIMENSION	MINIMUM	MAXIMUM
A	Height		130 inches
B	Overall width – rub rail to rub rail		99 inches
C	Overall length		448 inches
D	Wheelbase		236 inches
E	Wall to wall – radius (left and right)		42 feet
F	Curb to curb (left and right)		38 feet
G	Turning radius (left and right)		37 feet
H	Cab Width (Interior door panel to interior door panel)	91 inches	96 inches
I	Cab width (skin to skin)		
J	Road clearance rear jacks	11.5” inches	
K	Road clearance all other components except axles and fuel tank	10 inches	
L	End-to-end jack spread		18 feet
M	Angle of Approach	14.5 degrees	
N	Angle of Departure	11.1 degrees	

1. GENERAL REQUIREMENTS (CONTINUED):

- 1.10 Certificate of Origin: Manufacturer shall provide, upon delivery of each apparatus, its **original Certificate of Origin**.
- A list shall be provided indicating apparatus chassis numbers and serial numbers of aerial ladder, engine, transmission, axles and driveline retarder mounted thereon.
 - The manufacturer shall supply to FDNY a list of replacement part numbers, and their commercial equivalent if available, for all filters, belts, hoses and light bulbs at time of delivery of pilot model.
- 1.11 Certificate of the Adequacy of Components: Written certification of the adequacies of the below listed components **shall accompany vendor's bid**.
- Chassis frame
 - Engine
 - Transmission
 - Brakes
 - Axles
 - Steering gear
 - Tires
 - Other assemblies or units which FDNY may request.
- 1.12 Original Equipment Manufacturer's application approval shall be provided for the engine, transmission, retarder, suspension and axles – provide AER (or other mandatory testing) certification for the completed pilot model.
- 1.13 Provide the following at time of delivery of the pilot model:
- Original Equipment Manufacturer's certificates for extended (5 year) warranty on engine and transmission, as detailed in standard requirements of specification, Warranty Section.
 - Apparatus manufacturer's certificate of five (5) year bumper to bumper warranty as detailed in standard requirements of specification, Warranty Section.
 - Provide a certified third-party inspection of aerial as per N.F.P.A 1900 and 1914 as they pertain to this FDNY specification.
 - Provide certificate on emergency lights as per N.F.P.A. 1900
 - Provide certificate on electrical load test as per N.F.P.A. 1900
 - Provide load capacity chart for aerial ladder and tilt table test report.
- 1.14 Provide a drawing showing all turning radius and approach/departure angles.
- 1.15 All hardware shall be grade eight (8) with self-locking nuts in critical areas and/or caged nuts as approved and directed by FDNY.

1. GENERAL REQUIREMENTS (CONTINUED):

- 1.16 Engine and transmission mounts shall be “poly” type if available. The engine mounts on the pilot model shall be certified by the engine manufacturer as they pertain to vibration. Engine mounts shall be located above the chassis mounts to ensure that the engine remains in place in the event of mounting bolt or other hardware failure.
- 1.17 “Barrier Tape”, or equal, shall be used wherever/whenever necessary to isolate dissimilar metals and prevent corrosion/electrolysis.
- 1.18 After completion of all road, brake & aerial testing and before final acceptance by FDNY, a complete preventive maintenance inspection shall be performed on each apparatus delivered. Note: These documents shall be provided to FDNY upon delivery.

This shall include but not be limited to:

- Change engine oil and filter.
 - Change hydraulic system filter – check fluid for debris.
 - Check and top off all fluids.
 - Change fuel filter(s)
 - Inspection of brakes at each wheel position
 - Check tightness of wheel nuts and U-bolts – re-torque if necessary.
 - Check operation of all electrical devices, systems, and lights.
 - Check operation of hydraulic generator.
 - Check and correct air pressure in all tires.
 - Check auto lube systems for proper operation.
 - Correction of all deficiencies
 - Lubricate all grease fittings.
 - Written documentation, a check-off list, of this inspection shall be provided for each individual apparatus - the VIN number shall be noted and the document shall be signed by the person completing the inspection—all deficiencies found/corrected shall be noted.
- 1.19 See Section 26 for warranty information.

2. CHASSIS FRAME / FRONT BUMPER / TOW ATTACHMENTS:

2.1 Gross Vehicle Weight Rating: **70,800** pounds, minimum.

2.2 Chassis / Frame:

- **The chassis frame and all components thereof shall carry a lifetime warranty against any/all types of failure with the exclusion of major accident damage.**
- The chassis shall be manufactured and designed by the bidder. The chassis shall be designed for a GVWR in excess of both a full complement of equipment and a six (6) person crew.
- The chassis / frame shall be designed and manufactured for heavy duty service. It shall have adequate strength and capacity for the intended load, duty cycle, and service requirements of the New York City Fire Department.
- Chassis frame shall be constructed of R7 high strength steel with a minimum rating of 120,000 PSI.
- The chassis frame shall be full length double rail, minimum construction. A full length frame liner (from end to end) shall be provided.
- All cross members bolted in place with grade “8” hardware, 5/8”-18 minimum flange head bolts with “Spiralock” nuts **“Huck Bolts” are not acceptable.**
- Holes in the frame area for required, apparatus specific, componentry only. No “swiss cheese” type rails. Holes shall be confined to the neutral / middle area of the web. No removal, cutting or notching of cross members.
- The area between axle front most and rearmost suspension hangers shall be free of any welding, holes or fasteners in the frame flanges. No welding shall be incorporated in attachment of components. All frame dimensional cutting shall be by a plasma cutter or mechanical means only. All relief areas shall be cut in a 30-degree angle with a 2-inch radius at intersection points with edges ground smooth to prevent a stress focal point.
- Frame rails and all components thereof shall be coated with a rust resistant paint, **“Job Red”** including, but not limited to, air tanks and axles.
- Line loading diagram with bending moment & shear curve shall be provided at the Preconstruction Conference.

2. CHASSIS FRAME / FRONT BUMPER / TOW ATTACHMENTS (CONTINUED):

2.3 Front Bumper:

- The front bumper extension shall be 80,000 psi high tensile steel channel, minimum (9" high x 3" wide x .25" thick approx.) Designed to protect the front of the apparatus from, head-on and angled, impact loads. The bumper shall be securely bolted directly to frame members with correctly sized grade "8" hardware. The bumper shall be backed full width and full height with 1/4" thick steel for strength and rigidity. The bumper backing shall be formed in the same manner and shape as the outer bumper. The bumper corners shall also be supported in the same manner to withstand side /angular impacts. The extension shall be painted **red**, and the bumper face shall be painted **red**. The final bumper design shall be approved by FDNY.
- The bumper support bracket shall have sufficient strength to withstand high impact and towing/recovery operations. Bumper and brackets shall be bolted in place.
- The bumper extension assembly shall be able to support the apparatus weight without bending or damage when the unit has to be lifted by front for towing and withstand towing / recovery operations.
- The front bumper extension shall be a maximum of 10" from front of cab.
- All open areas shall be covered with 3/16" aluminum tread plate and shall be bolted in place.
- Guide Poles: Removable stainless steel with non-illuminated **amber** lenses on the tips. They shall be mounted on the left and right sides of the bumper visible to the chauffeur. Poles shall be mounted in a bolt on sleeve type bracket on the outside of the bumper surface, and shall be angled if necessary. The pole shall have a tethered pull pin that allows for the removal of the pole from the bracket.
- Siren speaker and air horn shall be installed in front bumper, recessed behind bumper. The siren speaker shall be boxed in an aluminum plate enclosure. Cut-outs shall be provided in bumper on the left hand side for the siren speaker and the right hand side for air horn, with a highly polished stainless steel grating installed in front of the speaker only. Both speaker and air horn shall be easily removable for service without the need to remove the bumper. The cutout in the bumper for the air horn shall be larger than the trumpet end of the air horn.

Note: The siren speaker mounting shall allow for interchangeable installation of a Federal Signal™ "MS100" or "ES100C" speaker. See Section 25 for siren speaker details. In addition, there shall be provisions for the wiring and mounting of a mechanical siren. Further details shall be discussed at the Preconstruction Conference. **Bumper and all related details shall be discussed further at the Preconstruction Conference and approved by FDNY.**

2. CHASSIS FRAME / FRONT BUMPER / TOW ATTACHMENTS (CONTINUED):

2.4 Tow Attachments:

- Two (2) 1" steel plate **job red** painted tow eyes, with a minimum of six (6) grade #8, 5/8" bolts each side. The plates shall have 3" inside diameter holes. The front tow eyes shall be rated to allow pick-up of front of apparatus, capable of lift, tow and recovery operations. A clearance of 3" from the bottom of the 3" hole in the eye to the gravel plate shall be provided as well as a clearance of 3" from the body. Tow eyes shall not extend nor protrude beyond bumper surface.
- Two (2) 1" **job red** painted steel plate tow eyes, same as described above, shall be bolted directly to the rear frame with a minimum of six (6) grade #8, 5/8" bolts each side. All dimensions and clearances shall be the same as described above
- Tow eyes shall be a 'captured' and/or cradled design that shall cradle the chassis in such a manner to lessen the stress on the bolts. Holes shall be circular—slotted or elongated type holes are not acceptable. Tow eye design, spread and final mounting location shall be approved by FDNY.

3. FRONT AXLE / SUSPENSION:

3.1 Front Axle: The front axle shall be a Dana™ “D2200W”, or equal, and shall have a capacity of 22,800 pounds, minimum – (the axle itself shall be rated at 24,000 lbs. minimum) GAWR axle capacity certified by axle manufacturer. **Note: upon delivery to FDNY, there shall be a minimum of 2,000 lbs. clear payload capacity on the front axle.**

- Front axle wheel bearings shall be grease lubricated (no oil).

3.2 Front Suspension:

- Shall be equipped with elliptical type leaf springs with military type double wrapped front eye.
- Rated at 22,800 pounds, minimum.
- Spring pins and shackle pins, non-rotating type, designed for ease of removal and greased by auto lube system, at every bushing position. Pin size shall be 1”, minimum. All spring bushings provided with spiral grooves and a center circular groove to permit grease to penetrate around the pins completely. Serrated pins with nuts are **not** acceptable.
- Access panels shall be provided as deemed necessary by FDNY to facilitate free access to shackle pins and hangers and to permit ready removal of springs.
- Heavy duty, (3 ¼” diameter minimum) double acting shock absorbers shall be provided. Shock absorber bushings shall be polyurethane type, if available.
- Shock absorbers shall be mounted in accordance with the shock absorber manufacturer's recommended angles and shall be field replaceable.

4. STEERING:

- 4.1 The front steering system shall be adequately sized for front axle loading. Steering shall function smoothly from lock to lock under all conditions (including idle) and have proper return characteristics at all times, under all operating conditions. A second steering gear or assist cylinder(s) shall also be acceptable.
- 4.2 All power steering hoses shall be properly sized and rated for the application. They shall be Parker™, or equal, with a wire braid jacket. The pressure side shall be fabricated with the proper crimp fittings and the return side shall have reusable fittings.
- 4.3 The power steering pump shall incorporate a built-in relief valve and regulator. Final design subject to FDNY approval.
- 4.4 The power steering reservoir cap shall be color coded **blue** and shall be properly labeled.
- 4.5 The steering column shall be a tilt and telescoping type with an 18" steering wheel. The steering wheel shall be covered with **black** Absorbite™, or equal, padding. The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch on turn lever. If deemed necessary by FDNY, a bolt on cover shall be installed over the steering column. Design and final installation shall be approved by FDNY.

NOTE: The turn signals shall not operate when the master disconnect switch is turned to the 'OFF' position. The four-way hazard flashers shall be wired to battery positive.

5. REAR AXLE / DRIVELINE RETARDER / SUSPENSION:

- 5.1 Rear Axle: The rear axle(s) shall be Dana™ model D52-190 (axle shall be rated by the axle manufacturer at 52,000 lbs.), or equal, mounted to provide optimum driveshaft angle, combined 48,000 pounds, minimum, certified by the manufacturer. The single reduction differential shall be geared to provide maximum acceleration while maintaining a top road speed not less than 55 mph, and not greater than 58 mph.
- 5.2 An interaxle controlling device shall be installed on the intermediate axle and rated to exceed engine torque output. A chauffeur controlled, protected interaxle dash mounted switch with an indicator light shall also be provided.
- 5.3 Differential locks shall be provided on both rear axles with a chauffeur controlled protected dash control switch with an indicator light.
- 5.4 Rear axles shall have oil lubricated wheel bearings.
- 5.5 Driveline Retarder: Klam™, or equal, shall be provided. Wiring shall be “side mount” style. It shall be properly sized for apparatus load – driveline mounted– stages 1 and 2 activated simultaneously through off throttle status and shall apply the brake lights when activated. – stages 3 and 4 activated by brake application and shall function in sequence – four lights on control panel to indicate stage that is activated operation of retarder shall interface with “ABS” system - brake pedal application of retarder shall continue to work when ABS system senses a failure. System design, component location and operation shall be approved by FDNY.
- 5.6 Rear Suspension: Rear suspension shall be a Ridewell™ “Dynalastic 202”, or equal “rubber block” (suspension shall be rated by the suspension manufacturer at 52,000 lbs.) capacity 48,000 pounds, minimum, installed as per manufacturer’s recommendations. Suspension shall have limiting straps. Suspension components package shall be engineered and approved by the manufacturer and shall contain the heaviest duty tracking bars and torque bars available for this application-both the transverse torque and fore/aft bars shall be “bolt on” style on both ends– components and installation approved and signed off by factory PE –. All rear suspension details shall be approved by FDNY. Protection plates for the chassis rails shall be provided to prevent damage of air lines and harnesses in the event of the separation of the transverse torque rods.
- 5.7 The rear suspension shall utilize Hendrickson Severe Duty Traxx™, or equal torque rods for dampening / isolation of noise and vibration.
- 5.8 Access panels shall be provided in compartments if necessary to provide access to suspension components to facilitate service.
- 5.9 Heavy-duty shock absorbers shall be mounted in accordance with the shock absorber manufacturer's recommended angles and shall be field replaceable.

6. BRAKES:

- 6.1 Brakes shall be heavy duty, full air disc type with ABS and ATC.
- 6.2 Front and rear brakes shall be Knott™ (latest version), or equal, with 17” vented rotors.
- 6.3 Friction material for front and rear brakes shall be the latest fire service rated composition available from the manufacturer.
- 6.4 The minimum size of the four (4) rear brake chambers shall be “2424”, piston type design, with provisions to mechanically release the parking brake for towing.
- 6.5 Apparatus shall be equipped with a braking system that is in compliance with all applicable federal, state and local requirements for apparatus of the weight class.
- 6.6 All brake system components shall be installed in accordance with the manufacturer's instructions and recommendations. If there should be any conflict with federal regulations in effect at the time of award of contract, federal standards shall be complied with.
- 6.7 Bidder, in their bid, shall detail any/all departures from specifications which are necessary to comply with Federal regulations.
- 6.8 A complete schematic of the air system arrangement shall be submitted at the Preconstruction Conference for FDNY approval.
- 6.9 A Wabco™, or equal, three (3) axle anti-lock braking system (6S-6M), with automatic traction control shall be installed for safer apparatus control during braking and reduced stopping distance in all skid applications. Traction control shall apply brake on slipping wheel and drop electronic engine throttle back to prevent wheel spin while accelerating on a slippery surface. Provide a deep mud and snow switch for ATC, switch shall have a **red** spring loaded flip cover to prevent accidental activation. ABS ECM shall have a shielded cover. There also shall be an indicator light on the dash visible to the chauffeur to indicate a system malfunction.
- 6.10 Air compressor shall be an engine manufacturer approved, gear driven, water cooled, engine lubricated unit. Any possible alternative shall be approved by FDNY. There shall a resonator used to suppress compressor noise. Further details shall be discussed at the Preconstruction Conference. There shall a resonator used to suppress compressor noise. **The apparatus shall pass the build-up test specified in Section 27.** A Cummins™, or equal approved resonator shall be provided to provide quiet operation during air build-up.
- 6.11 Air pressure governor shall be located in an easily accessible area to facilitate adjustment, service and replacement. If necessary, a remote air pressure governor shall be acceptable.
- 6.12 System pressure shall be set at one hundred twenty-five (125) PSI.

6. BRAKES (CONTINUED):

- 6.13 The line from the compressor to the dryer shall be a properly sized line. This line shall be stainless steel on the compressor side and on the rear portion. The line shall be located so that it is field serviceable/repairable. A bulkhead fitting shall be used to split the line into two for easier service. Final layout and location shall be approved by FDNY.
- 6.14 Brake plumbing- all plastic lines shall be reinforced nylon, SAE and DOT approved/rated, protected by Parker™, or equal, type chafe guard or loom - all plumbing secured with approved clamps – all air brake fittings and lines shall be rated for high heat conditions - braided flex hoses shall provide flexibility between frame and axle connections - all hoses to chambers protected by Spiral Guard™, or equal.
- 6.15 Air brake system shall be equipped with an automatic air dryer, Bendix™ model #AD-9 desiccant type, heater thermostat controlled, safety valve, check valve, purge valve or equal.
- 6.16 A Bendix™ “Puraguard”, or equal, system filter shall be provided to remove oil and other contaminants. It shall incorporate a built in bypass and drain valve. Filter installed in supply line between air dryer and “wet” tank.
- 6.17 Air system shall be plumbed in a manner that will provide “rapid build-up” of air pressure.
- The air system shall be plumbed using Alkon™, or equal, push-on type fittings and all air system components shall be rated for high temperature use.
- 6.18 A 150 PSI safety valve shall be provided on the “wet tank”. This tank shall be properly located to reduce potential damage and shall be approved by FDNY.
- 6.19 Air System Capacity: Total air system capacity shall be: 8,710 cu in, min. The main air supply capacity shall be 6,300 cu in, min. The auxiliary air supply (for the air system and auxiliary air outlet) shall be 1,770 cu in, min and the tilt cab air seal air capacity shall be 640 cu in, minimum.
- 6.20 All air tanks shall be equipped with pressure protection valve(s). In the event that the auxiliary air supply is depleted, there shall be no draw of air from the “main” air supply. This aux air supply shall be used exclusively for the air horn and external aux air outlet. All air tanks shall be stenciled for easy identification. Component selection, layout, final design and installation shall be directed and approved by FDNY.

6. BRAKES (CONTINUED):

6.21 Auxiliary Air Outlet:

- Outlet shall be plumbed to the auxiliary air tank.
- A ninety (90) degree shut-off valve and 1/4" stainless steel Kimball Midwest™ 52-797, or equal, female coupling and #52-790, or equal male nipple. type high-flow, push-pull coupler shall be provided.
- A check valve shall be installed between the shut-off valve and push-pull coupler.
- Outlet and shut-off valve shall be recessed in a location directed by FDNY.
- Installation shall be subject to FDNY approval.

6.22 Heavy duty manual drain valves with pull cables shall be provided on **each** tank to drain condensation. An automatic type drain is not acceptable. Drain cables shall be routed to a readily accessible location on outer cab / body. Drain cables shall also have sufficient slack built into the design to prevent unintended activation as a result of body flex/movement. Identify location with a permanently mounted placard that reads "Drain Daily". Placards shall **not** be installed on rub rail. Final design and layout shall be approved by FDNY.

6.23 Passive Security System: Vehicle shall be equipped with a Vista Brake™ VBL-17, or equal, passive security system that utilizes a four (4) to six (6) digit code entered through a backlit keypad in the cab to allow the apparatus parking brake control to be released. This system shall lock out the parking brake control when the chauffeur leaves the driver's seat via an open driver's door. System shall be equipped with a driver's door switch that indicates an open driver's door condition. There shall be a seat sensor in the driver's seat to detect driver occupancy. Keypad shall display visual signals to the operator indicating "Door Open" and "Seat Not Occupied". Keypad shall also display a visual signal that system is in the secure mode as well as displaying a visual signal that the security aspect is deactivated. Location of all components shall be approved by FDNY.

6. BRAKES (CONTINUED):

6.24 Parking brake (maxi) control valve operating handle shall be mounted to right hand side of chauffeur, within easy reach.

- Parking brake control valve shall be Sealco™ P/N “110221”, or equal with Sealco™ P/N “9073”, or equal, **yellow** permanently labeled knob.
- Parking brake control valve shall operate as follows:
 Push- to apply
 Pull- to release

6.25 An auxiliary parking brake control shall be installed on the officer's side of cab as directed by FDNY. This control shall give the officer the ability to activate the parking brake in the event of an emergency. The activation of the switch shall also disable the cab throttle, returning the engine to idle speed. The cab accelerator shall return to an active state when this switch is returned to the 'normal' (open) position.

- This control shall be guarded against accidental activation
- A **red** pilot light shall be located near control to indicate activation and shall remain illuminated until deactivated. See section 13 for further information on this light.
- Control & pilot light shall have permanent placards stating “Caution: Emergency Use Only” and “Parking Brake Activation -Throttle Disengagement” as well as ON/OFF arrow indicators.
- If this system is electrically controlled and power is turned off, the batteries are disconnected, or disabled for any other reason, it shall not affect the releasing of the apparatus parking brake.

6. BRAKES (CONTINUED):

- 6.26 Front Brake Lock: The apparatus shall be equipped with a front brake lock system activated by a switch in the cab. In addition, an indicator light shall be provided. The front brake lock shall be interlocked with the parking brake and shall deactivate when the parking brake is released. Further details shall be discussed at the Preconstruction Conference.
- 6.27 The brake system shall be equipped with quick release system and Bendix™ R-14, or equal, anti-compound valve. Note: A Bendix™ R-14/ Wabco combination modulator valve shall also be acceptable.
- 6.28 The brake pedal shall be mounted in the same plane as the accelerator pedal.
- 6.29 Two (2) “Glad Hand” connectors shall be provided at the front of the apparatus to control the operation of the parking brake and the rear service brakes from a tow truck when it is being towed.
- One (1) glad hand, color-coded “**Red**”, plumbed to supply air pressure to release the parking brake. Glad hand shall be plumbed in a manner that will immediately apply the parking brake in the event that the supply air should become disconnected or fail. This glad hand shall have a ¼ turn shutoff valve.
 - One (1) glad hand, color-coded “**Blue**”, plumbed to supply air pressure to apply the rear service brakes.
 - Each glad hand shall be equipped with a vented, removable dust cover, secured to the apparatus with a vinyl-covered chain.
 - A pressure switch shall be provided in the glad hand system to activate the apparatus brake lights when the brakes are applied by the tow vehicle.
 - The exact location and operation of glad hands shall be approved by FDNY.

7. TIRES AND WHEELS:

7.1 Tires:

- Tires and tire capacities shall meet, or exceed, all applicable federal, state, and city regulations and standards. All tires shall be non-directional, and capable of being mounted on the left or right side of the apparatus.
- Tire weight ratings shall meet or exceed gross axle ratings.
- Tires shall be steel cord, radial, tubeless.
- Two (2) front tires shall be Goodyear™ “WHA”, or equal, 425/65R22.5 load range “L”, rated wet or dry traction - tubeless radial. Tires shall be rated at 11,400 pounds each, minimum.
- Eight (8) rear tires shall be Goodyear™ “G182 RSD”, or equal, – 11R22.5 rated for all weather traction - load range “H” – tubeless radial. Tires shall be rated at 6,005 pounds each, minimum.
- Tire air pressure placards shall be installed on front and rear wheel fenders, at all wheel positions. Pressure indicated shall be that recommended by the tire manufacturer.

7.2 Wheels:

- Wheel weight ratings shall exceed gross axle weight ratings and meet or exceed tire inflation requirements. Wheels shall be correctly sized for the tires being installed on the apparatus.
- Hub piloted Alcoa™, or equal, aluminum wheels – ten (10) hole, 11-1/4" bolt circle with “Clean Buff” finish.
- Rear wheels shall be installed so cut-outs in wheels line up to each other.
- Securex®, or equal, wheel fasteners – 5061 (PTFE) coating – nut body SAE 1045 through hardened to RC 26-32
- All lugs shall be equipped with Wheel Check™ or equal, **orange** wheel nut indicators, with a minimum temperature rating of 450° F.

8. AUTO LUBRICATION SYSTEM:

- 8.1 Vogel/SKF Lubrication Systems™, or equal, automatic lubrication system shall be provided. System operated by an electrically driven 12-Volt DC gear pump. The pump shall be capable of operating against a backpressure of 38 bar, nominal, with an output of 160 cc/min. Reservoir capacity: 2.7 liters, minimum. Grease type shall be NLGI #2.
- 8.2 Power unit / reservoir shall be mounted in a protected area allowing ease of service. Location shall be approved by FDNY.
- 8.3 System shall include an electronic control module that monitors main line pressure and operation cycles with LED pilot lights. Adjustable interval cycle, 1 hour to 11 hours in 1 hour increments. Control shall include a system reset button to initiate one cycle for diagnostics and/or reset the module after a fault. Upon fault, system shall disable until corrected and reset. Module shall be mounted in an area that will provide a clear view of pilot lights.
- 8.4 System shall be connected to lubricate **every compatible** lube point on the apparatus. All dosages as per system manufacturer. Final selection of lube points shall be approved by FDNY.
- 8.5 Distribution of lubricant to any and all lubrication fitting / points on apparatus via piston distributors, with metering nipples that bear dosage identification. Nipples shall be field changeable without disruption of other lubrication point connections.
- 8.6 Provide an **amber** “auto lube system” warning light on the dash.

9. ENGINE:

9.1 A Cummins X10™, or equal, diesel engine shall be supplied. It shall have but not be limited to the following requirements:

- Six (6) cylinders
- 10 liter
- Four (4) stroke design
- Four (4) valves per cylinder
- Water cooled
- High performance variable output turbocharger
- Full computer-controlled technology
- 450 HP minimum @ 1800 RPM.
- 1650 lb.-ft minimum torque @ 1000 RPM
- 1500W OEM block heater
- Components shall be driven by their own dedicated belt
- Belt routing diagram including part# installed as directed by FDNY
- OBDII port shall be available for the installation of DCAS approved telematics hardware, OBDII port shall be in an accessible location.

9.2 Oil filters shall be readily accessible, spin-on type.

9.3 If the plug is located on the bottom of the pan, it shall be a recessed square type.

9.4 Any grease fitting on the engine or its accessories shall be remotely mounted for easy access, properly routed and labeled.

9.5 Engine shall be a commercially produced truck engine, all parts readily available. Provide OEM application approval and certification for fire service.

9.6 Engine shall accelerate quickly and smoothly from a standing start, without any “bogging”, hesitation or time lags in the acceleration curve. OEM engineering shall immediately correct any problems in performance noted by FDNY.

9.7 Certified power curves:

- Bidder shall submit certified power curves on the model engine offered before award.
- The bidder shall submit certified AER (or other mandatory testing) results, torque, and horsepower curves for engine specified. AER (or other mandatory testing) shall be performed and certified on / for a completed apparatus- cab, body, panels, covers and all cowlings in place / mounted.

9. ENGINE (CONTINUED):

9.8 A performance "SCAAN" shall be provided.

9.9 At the time of apparatus manufacture, the engine shall be certified as complying with all applicable requirements. Vendor's bid shall reflect all exhaust / emission components and accessories needed to comply with any applicable emissions requirements, as well as emission system lights and warning devices provided in the chauffeur's and officer's areas of the apparatus, and as directed by FDNY.

- Mobile regeneration speed as well as emission-related settings shall be further discussed at the Preconstruction Conference. There shall be no regeneration when the apparatus is in PTO mode.

9.10 Fuel System:

- Engine shall be approved for use with #1 and #2 ultra-low sulfur diesel fuel as well as renewable diesel fuel. Written certification shall be provided detailing all approved fuels.
- 304 stainless steel fuel tank with a minimum drawable capacity of 50 gallons shall be welded safety type, constructed of #10 gauge, minimum, stainless steel. Tank shall have a minimum ground clearance of 13". **Fuel tank shall be full at final delivery.**
- Fuel tank shall have at least one (1) baffle plate, sump, and a drain plug with a recessed 1/2" square. A "drop-out" cradle type mounting, with 5/8" diameter minimum threaded rods and nylon locknuts, shall be provided.
- Fuel tank shall be located at the rear of the apparatus. If the manufacturer is unable to mount the tank in this area, then a compartment shall occupy this space. Due to the various chassis and body combinations available, the details, location and layout of this compartment and / or tank shall be discussed at the preconstruction meeting. Tank mounting shall be designed to provide ease of removal. Final design shall be approved by FDNY.
- Fuel Sending Units: Sending units shall be top mounted for ease of service or replacement. It is the intent of FDNY to accept a "float" style fuel sending unit with a metal arm and a ball-type float mechanism. If a "float" style sender cannot be supplied, then a Centroid™ style sending unit shall be acceptable.

NOTE: If a Centroid™ type sending unit is used, it shall maintain the accurate fuel level reading regardless of electrical system Voltage.

- An access panel shall be provided for service of fuel tank, fuel lines and sending unit.

9. ENGINE (CONTINUED):

9.10 Fuel System (Continued):

- Fuel fill plumbing shall be securely mounted and suitably protected against damage. It shall not be routed through any body compartments. If the fuel fill plumbing is of metal construction, it shall be **stainless steel**. All fuel plumbing connections made into a rubber hose shall be inserted a minimum of 2" into the rubber hose.
- Walbro™ FRC-8, or equal, aux electric fuel pump shall be provided. Pump shall be plumbed to include an inline check valve and shall be installed near the fuel tank in an area that provides easy serviceability and replacement.
- The pump shall be wired to a dedicated, breaker protected, electrical circuit, controlled by a dash mounted momentary switch with a pilot light. Note: Pump shall have the ability to operate when ignition is 'On' **and** the switch is activated, regardless of whether the engine is running or not. Note: If this is not possible due to the engine manufacturer's requirements, then the operation of this pump shall be discussed at the Preconstruction Conference.
- Fuel lines shall be Parker™, or equal, with braided wire jacket and shall be of the recommended size by the engine manufacturer for the length of the run. "push to connect" fittings are unacceptable. Fuel lines shall be #6 size, minimum.
- Fuel filter - Davco™ #386 series, or equal, diesel fuel filter/water separator with thermostatically controlled heater, water-in-fuel indicator light, rated flow 150 gallons per hour, minimum, 10-micron minimum element, shall be properly secured and plumbed into fuel system. All electrical connections shall be "Weather-Pac" type.
- Fuel filter shall be accessible from under the apparatus, opposite side from exhaust piping. Final location approved by FDNY.
- Filter heater on a separate electrical circuit protected by a properly sized breaker.
- A fuel cooler shall be provided on the fuel return line plumbing. Exact type, design and location of cooler shall be approved by FDNY.
- Diesel Exhaust Fluid (DEF) Tank: Ten (10) gallon minimum capacity. Tank shall be full on final delivery, and shall have a "T" style handle to open and close the door. Sender shall be accessible without removing the tank. Location shall not impinge upon compartment space. Def tank shall have a mis-filling prevention device (ELAFIX™ 40, or equal, magnetic fill neck adapter) compatible with the system currently used by the City of New York. This adapter shall allow the refueling of the urea solution without the risk of misfueling. If deemed necessary by FDNY, there shall be a means provided to cool the DEF fluid to prevent boiling and heat it to prevent freezing. Further details shall be discussed at the Preconstruction Conference.

9. ENGINE (CONTINUED):

9.11 Cooling System:

- Cooling system shall have sufficient capacity to meet extended periods of full load operation in local ambient temperature and maintain engine at a temperature not to exceed maximum or minimum operating temperature as recommended by the engine manufacturer.
- Radiator: General Thermodynamics™, or equal, one-piece unit shall be provided. Certified as being adequate for all operating conditions and approved by engine manufacturer for its application. Radiator shall be removable by tilting the cab. Aluminum radiators may be acceptable with prior FDNY discussion and approval. Further details shall be discussed at the Preconstruction Conference.
- Particular attention shall be directed to the adequacy of radiator mounts and supports. Mounts shall be heavy duty rubber type. Radiator frame shall be gusseted to provide adequate support and protect radiator from movement and vibration damage. Radiator shall be removable without removing cab.
- Radiator shall have a welded in filler neck. The radiator fill shall be accessible without having to tilt cab.
- An easily removable screen or skid plate shall be provided across bottom of the charged air cooler and radiator to prevent damage from road debris. Design and location shall be approved by FDNY.
- All coolant drain valves shall be “petcock” type with FDNY approved labels. All valves shall be properly protected from damage.
- A low coolant level indicator shall be installed in radiator. Indicator shall be a type recommended by the engine manufacturer. Approval of the installation of indicator shall be supplied by both the engine and radiator manufacturers.
- Engine cooling fan shall be a Horton™, or equal, thermostatically controlled clutch fan. If it is equipped with a grease fitting, it shall be remotely mounted in an area approved by FDNY and properly labeled. The supply line shall be properly secured and protected. The distance of the activation solenoid to the fan shall be such that it does not affect operation.

9. ENGINE (CONTINUED):

9.11 Cooling System (Continued):

- Apparatus shall be delivered with the cooling system protected to minus forty degrees (– 40°) Fahrenheit with an OEM approved, Fleetguard® extended life (5 year, minimum) coolant and Fleetguard® “WF2122”, or equal, type remote coolant filter. if necessary, the proper coolant additive shall be provided. **The coolant shall be fuchsia colored, compatible with the current in use coolant used by FDNY, and shall be approved by engine manufacturer.**
- Additive shall be added, if necessary, to cooling system to provide proper PH factor.
- All cooling system hoses (including heater hoses), where applicable, shall be Gates™ “**Green Stripe**” or equal. Plastic split-loom chafe guarding, of the proper size diameter, shall be installed (full length where possible) to protect the hoses from abrasion damage. Hoses shall be connected to ¼ turn shut off valves at the engine, properly and permanently labeled. Shut off valves shall be mounted on a common fixed plate in the engine compartment. Final location of all components shall be approved by FDNY.
- Oetiker™ stainless steel hose clamps, or equal, shall be used on all silicone hoses to prevent cold water leaks. Clamps shall be installed in compliance with the manufacturer’s instructions. Where not available due to size, stainless steel liner clamps shall be used, Breeze Corp™., Aeroseal, or equal.

9.12 Primary and Emergency Engine Shut Down:

- The primary engine “Run” / “Off” operation shall be controlled by the engine Electronic Control Unit (ECU). The dash mounted ignition switch shall send a signal to the ECU that determines “run” mode or “off” mode. This shall be independent of the emergency shut down device.
- An emergency engine shut down shall be provided. This shall be an intake air shut down, electrically operated from a dash-mounted control, independent of the primary shut down.
- An engine manufacturer’s approved shutdown device shall be provided. A **red** indicator light shall be provided near the switch to indicate when emergency shutdown has been activated. The light shall remain illuminated until the control is reset.
- Indicator light shall turn off when shut down has been reset.
- Design and location of shut down / reset control subject to approval of FDNY.

9. ENGINE (CONTINUED):

9.13 Air Intake System:

- The air cleaner shall be a high mount dry type with a replacement canister as well as a heavy duty metal ember screen. It shall have outside air intake of full metal construction and an instrument panel mounted air restriction indicator to show when the air cleaner element requires replacement. It shall be designed to limit water intrusion. An automatic type drain shall be provided in the air intake as directed by FDNY. The air filter installed height shall be four (4) feet from the ground, minimum. The air intake installed height shall be five (5) feet from the ground, minimum. Final location of all components shall be approved by FDNY.
- An instrument panel mounted air restriction indicator to show when the air cleaner element requires replacement. It shall be designed to limit water intrusion. An automatic type drain shall be provided in the air intake as directed by FDNY.
- Any air intake piping that passes through cab or crew area shall be insulated to keep the airflow noise to a minimum. It shall consist of a removable wrap secured with Velcro, or equal, fabricated from 1/4" minimum foil covered insulation, 1/2" minimum foam core, covered in Cordura® or equal. Design shall be approved by FDNY.
- A heavy-duty air charge cooler, approved by engine manufacture, shall be mounted in front of the radiator. All air charge piping / hoses shall have proper clearance from other components to prevent any "rub through" damage from occurring.
- Final design, method of attachment, and locations of all the above air intake items shall be approved by FDNY.

9.14 Exhaust System:

- Exhaust system shall fully comply with all federal, state, and city current emission requirements.
- Exhaust system shall be certified as complying with all applicable federal, state, and city noise level standards for fire apparatus.
- Stainless steel flex tubing shall be installed between turbocharger and exhaust pipe, if applicable.
- A removable / reusable thermal exhaust blanket, wrap around type, shall be installed on the turbocharger, if applicable.

9. ENGINE (CONTINUED):

9.14 Exhaust System (Continued):

- The entire system (from manifold to exit pipe) shall be insulated or shielded where necessary to prevent heat transfer to any other components. These components shall include but not be limited to:
 - Engine and related items
 - Transmission and related items
 - Chassis and related items
 - Fuel hoses / lines
 - Air hoses / lines
 - All wiring and batteries
- Adequate heat deflector shield shall be installed under compartment floors.
- Provisions shall be made for connection to the FDNY Nederman™ exhaust system as installed in all firehouses. This shall include but not limited to: proper angles on exit pipe, receiver plate and transmitter (located in cab, wired to ignition “on”). Note: due to recent changes in Nederman™ components, the location of exhaust exit and Nederman™ component layouts shall be determined at the Preconstruction Conference.
- Exhaust shall be horizontal and have proper body clearance and shall terminate flush with rub rail. The exhaust pipe shall be “indexed” to prevent loosening and distortion. Further details shall be discussed at the Preconstruction Conference.
- Exhaust system piping shall be sectioned so that it is easily removable and replaceable.
- Final layout and component location of exhaust system, including any other remotely located related item, shall be approved by FDNY.

9. ENGINE (CONTINUED):

9.15 The following shall be readily accessible without tilting of cab or removal of engine side panels:

- Engine oil dip stick and fill - color coded **yellow**
- Power steering dip stick and fill - color coded **blue**
- Transmission fluid dip stick and fill- color coded **red**
- Engine coolant fill (with low and high markings) *
- Windshield washer fluid fill (with low and high markings) *

* The level in these reservoirs shall be easily visible. If deemed necessary by FDNY there shall be an LED light to illuminate these reservoirs. Further details shall be discussed at the Preconstruction Conference.

9.16 Accelerator pedal shall be a Williams™, or equal, electronic type, installed per engine manufacturer's requirements. Pedal shall be floor mounted, on the same plane as the brake pedal.

NOTE: There shall be a 1 ¾" minimum distance from the engine enclosure to the closest edge of the accelerator pedal, a minimum of 2 ¾" between the throttle pedal and the brake pedal and minimum distance of 1 ¾" between the brake pedal and the steering column, using the current in use sized pedals.

9.17 Malfunction Warning System: Audible alarms with individual visible warning lights for each function (see Section 13) to include, but not be limited to:

- Low oil pressure
- Low coolant level
- High coolant temperature
- Stop engine
- High transmission temperature
- Lights/alarms for current emission standards shall also be provided— **No shutdown of engine--- audible & visual alarms only. No de-rate shall be permissible except as mandated by federal law.**

NOTE: The apparatus shall have a placard easily visible to the chauffeur that states that the ignition should not be turned off if the diesel exhaust fluid (DEF) light illuminates. Exact verbiage shall be discussed at the Preconstruction Conference.

10. AUTOMATIC TRANSMISSION:

- 10.1 Transmission shall be Allison™ 4000 EVS, or equal, 580 HP gross input power with all electronic controls, six (6) speed automatic with 6th gear locked-out, and Prognostics™ feature. Transmission shall be programmed with “aggressive dynamic” shift pattern. Transmission shall be factory filled with approved synthetic fluid. Further details shall be discussed at the Preconstruction Conference.
- 10.2 Transmission shall be plumbed to an internal oil cooler in the radiator, in a full flow coolant system application, as per OEM, to ensure adequate cooling. Any departures require written application approval from transmission OEM.
- 10.3 The pressure sensitive range selector touch pad, to right of the chauffeur with the mode legends shall be back lit for night use. Touch pad surface mount type, separate from “ECM”
- 10.4 The transmission gear ratios shall be:

1ST	3.51:1
2ND	1.91:1
3RD	1.43:1
4TH	1.00:1
5TH	0.74:1
6TH	LOCKED OUT*
REV	-4.80:1

*NOTE: Due to the various drivetrain combinations available, it may be necessary to enable 6th gear to maximize performance and acceleration. This shall be discussed further at the Preconstruction Conference. The vendor shall provide FDNY with various drivetrain combinations for review and approval.

- 10.5 High transmission oil temperature audible alarm and indicator light on cab dash.
- 10.6 All transmission hoses shall be Parker™, or equal, braided hose with reusable fittings for all medium pressure applications on automatic transmission and cooler.
- 10.7 Transmission shall be installed with a rear top mounted support approved by the transmission manufacturer.
- 10.8 An accelerator inhibitor shall be programmed into the unit to prevent the throttle pedal from being utilized when the apparatus is in the neutral mode while in PTO mode.

11. DRIVESHAFTS:

- 11.1 Drivelines/shafts shall be adequate for the apparatus specified, and shall be Spicer™ “1810HD Series”, or equal.
- 11.2 All U-joints shall be Spicer™ #1810 Series, or equal, mechanic type.
- 11.3 Drive shafts shall be in compliance with all applicable standards and regulations.
- 11.4 The driveshaft angles and installation shall comply with axle, transmission, retarder and driveline component manufacturers requirements.
- 11.5 A computer generated drawing of driveline, engine, and transmission installations indicating angles and lengths shall be submitted at the Preconstruction Conference and a final drawing of driveshaft length upon delivery of apparatus.
- 11.6 All drive shafts shall have suitable guards, multiple if necessary, with catch brackets to prevent damage in case of failure of shaft or universal joint. The guards shall be mounted as close to the joints as possible without impeding removal of the shaft. All guards shall be a “drop out design” utilizing a “U” shaped bracket with a locating pin and a bolt on each side. It is the intent to capture the shaft at all joints. Number, type and location of guards shall be approved by FDNY. Fabricated stainless steel splash shield shall be provided to prevent grease from being thrown on other components.

12. 12 VOLT ELECTRICAL:

- 12.1 Batteries: Six (6) 12 Volt - Odyssey™, AGM batteries, model #PC2150 or equal, Group 31, 1150 CCA minimum, 205 minute minimum reserve capacity. Alternator, battery tray and battery charger area shall be labeled “System calibrated for use with AGM batteries. Replace only with AGM batteries.”
- 12.2 System shall be 12 Volt with negative (–) ground.
- 12.3 Chassis frame shall be used as common ground.
- 12.4 Battery cables: 000 (triple 0) gauge, minimum - positive (+) shall be **red** and negative (–) shall be **black**, covered by protective loom. Individual cables shall be connected to a common connecting point. Jumper cables from battery to battery will not be accepted. Battery terminal extenders shall be acceptable. No “stacking” of terminals on the batteries.
- 12.5 Battery mounting location shall be in crew cab step area. This area shall be accessible through hinged doors in crew cab step area. Battery enclosure & all mounting hardware shall be type 3CR12, or equal stainless steel for corrosion resistance. The battery hold-down hardware shall be captured so that they do not fall out of the tray when the batteries are serviced. This compartment shall be coated in Linex™, or equal. The bottom of the enclosure / tray lined with Mateflex™, or equal & adequate, protected, drain holes. A stainless steel sliding tray shall be provided if necessary for easy service access to batteries – cover shall be equipped with stay-arms if necessary - location and design shall be approved by FDNY.
- 12.6 There shall be a Blue Sea™ 3000, or equal, main / master electrical disconnect on the positive battery cable circuit, mounted at chauffeur’s area. Some electrical items will be required to stay “hot” at all times, and not be wired through this switch. These items will be discussed at the pre-construction conference.

Note: This switch shall be easily removable without the need to remove any other components to access it. Final design and layout of all components shall be approved by FDNY.
- 12.7 **A fully enclosed, weather resistant**, battery wiring control box shall be installed near the battery location. The box shall include three (3) minimum, automatic reset circuit breakers. The breakers shall supply power to engine & transmission electronics, and engine fuel injectors.
- 12.8 Electronic engine / transmission system shall be powered through chassis battery. A dedicated battery and isolator is not acceptable. Wiring for this shall be as direct as possible to reduce Voltage drop to components as much as possible. If this differs from the manufacturer’s recommendations, FDNY shall be notified

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.9 Two (2) Gigavac™, or equal, heavy duty continuous duty relays, mounted in cab dash, shall be supplied: one (1) will supply power to cab and body wiring, controlled by ignition switch, and one (1) will supply power to warning lights, controlled by “master light” switch described in Section 13. Relays shall be properly sized for the intended loads. Further details shall be discussed at the Preconstruction Conference.
- 12.10 Emergency jump start system (as per SAE J1283) • Two (2) Kauffman Engineering™ or equal, receptacles #15126, or equal, with weather tight cover #15128, or equal, secured with cables, one (1) in each battery box • Wired direct to vehicle battery system. • Receptacle shall be labeled “Emergency Jump Start” • Twenty-five (25) foot “000” gauge jumper cable with plug compatible with receptacle (on both ends) shall be supplied with each apparatus • locations shall be directed by FDNY.
- 12.11 Starter: Delco™ model #39MT, or equal, 12 Volt, heavy duty high torque, with “over heating” protection.
- 12.12 One (1) heavy duty, three (3) position, rocker style ignition switch shall be provided on the dash.
- The three positions on rocker switch shall be labeled “OFF”, “RADIO”, and “RUN”. When the switch is in the “radio” position, the two-way radio equipment shall be operable.
 - When the switch is in the “run” position, it shall enable the starter switches, which are wired in parallel. There shall be two (2) momentary push button starter switches provided on dash. The power and ground for each switch shall be independent of the other switch.
- 12.13 If deemed necessary by FDNY, two (2) heavy duty, properly rated solenoids, wired in parallel, shall take the signal from start switches, and supply current to starter. The starter load shall not be wired through any other component. **Circuit shall be wired to ensure that starter receives maximum battery Voltage & amperage during cranking.** Solenoids shall be located in an area that provides ease of service and protection from the elements. Location shall be approved by FDNY.
- 12.14 Starter circuit shall be interlocked to operate in “transmission neutral” only & to disable engagement while engine is running
- 12.15 There shall be an interlock that prevents the operation of all HVAC fans and blowers during starter operation
- 12.16 A complete wiring diagram showing the starter wiring circuit in its entirety, including all interlocks & all components, shall be provided at the Preconstruction Conference. Wiring diagram and all component locations subject to FDNY approval.

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.17 Alternator: Niehoff™ #C574, or equal, 415 Amp, minimum, stabilized –modified pad mounted – high efficiency fan – enclosed brush / slip ring - supply certified charging graph, rpm shall include actual **engine** rpm. Alternator shall put out a minimum of 180 amps at idle.

Note: If another alternator is being proposed other than those listed above, the vendor shall provide FDNY with detailed technical data including reliability reports of the proposed unit.

FDNY reserves the right to approve the alternator model and the mounting system being proposed.

- Voltage regulator shall be completely accessible for replacement / adjustment
- Ignition feed wire from ignition switch to regulator ignition terminal shall be on separate circuit breaker, it shall not be wired with lights or accessories.
- The belt drive system for alternator shall be a serpentine belt with self- tensioner, approved by both alternator and engine manufacturer. A multi-belt system shall be acceptable with prior FDNY approval.

12.18 The failure of a non-essential component shall not affect the operation of any essential circuit.

- Circuits deemed essential shall include, but not be limited to: ignition, engine, transmission, PTO, aerial device related items and other circuits as specified by FDNY. Further details shall be discussed at the Preconstruction Conference.
- Circuits shall be wired in a manner so that they are as isolated as possible (by function) from other essential components, as well as non-essential components.
- Final layout of all electrical circuits shall be approved by FDNY.

- 12.19 If deemed necessary by FDNY, a shunt shall be provided to work in conjunction with an analog ammeter (mentioned in Section 13). Ammeter shall be wired to show actual load on the electrical system and output of the charging system.

- 12.21 A fast idle system shall be provided utilizing the OEM engine management system. When all interlocks (described below) are met, the high idle shall activate when the voltage drops below 13 Volts and stay on 3-4 minutes after the Voltage reaches 13.8 Volts. A properly labeled indicator panel shall be provided in cab that shall indicate when Voltage is “normal” and when “low Voltage” is detected & system is activated. The fast-idle system shall be interlocked with transmission "neutral", parking brake “applied”, all PTO units off, to permit automatic operation on "low Voltage" conditions Type & size of indicator panel and locations of all related components shall be approved by FDNY. **Note: shedding of loads shall not be acceptable.**

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.22 Prime vendor shall perform an electrical system load test and ensure adequate alternator output under all operating conditions. All tests shall be conducted in both response and stationary mode.
- 12.23 Prime vendor shall provide a complete electrical system load calculation at the pre-construction conference.
- 12.24 One (1) Kussmaul™ (P/N 59-02-2134), or equal. This kit contains the following: two (2) Super Auto-Eject, 120 Volt, 15 amp plugs- one (1) with **red** cover, one (1) with **gray** cover • One (1) onboard 12 Volt air compressor with automatic condensation drain • One (1) onboard 80A battery charger calibrated for use with “AGM” batteries • One (1) LED charge indicator panel.
- The auto-ejects and charge indicator shall be mounted on the left side of the cab over the front wheel opening area, on a large stainless steel brushed panel as directed by FDNY.
 - Battery charger & air compressor located as directed by FDNY – a metal cover shall be mounted for protection – automatic condensation drain shall be plumbed to drain out of cab.
 - **Red** auto-eject is for air compressor and battery charger
 - **Gray** auto-eject is for engine block heater
 - Auto-ejects properly labeled as directed by FDNY
 - All locations shall be approved by FDNY.
- 12.25 **All multiplexed wiring shall have prior FDNY approval.**
- 12.26 All wiring shall be high temperature GXL color coded and imprinted with circuit number & function every four (4) inches for ease of tracing & troubleshooting. Identification system subject to FDNY approval. Exceptions will be by FDNY approval.
- 12.27 Coded wiring diagrams & schematics shall be provided for complete apparatus, as built
- 12.28 Wiring and connections shall be protected from the elements and routed to avoid road splash. All wiring to highest standards & practices of the industry.

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.29 All wiring shall be securely fastened with rubber insulated metal wire clamps, properly routed and protected by rubber grommets or edge guard where passing through metal, any other sharp edge or any chafe area.
- 12.30 All wiring shall be enclosed in protective loom or sheathing to prevent chafing. Type of loom and method of installation, subject to FDNY approval.
- 12.31 Extreme care shall be taken in the installation of any wiring to avoid any high heat source that could expose the wiring to severe overheating or damage. As deemed necessary by FDNY, proper insulation, heat resistant loom and heat deflection panels shall be installed in such areas. Further details shall be discussed at the Preconstruction Conference.
- 12.32 All 12 Volt wiring to the body shall be routed down each side of the exterior body compartments in enclosed electrical raceways in the compartment roof area. The raceways shall be enclosed full length to protect wiring from damage and shall provide access for service
- 12.33 All wire connections and terminations shall be securely made and weather-tight (including removable “plug type” connections)
- 12.34 All permanent wire connections and terminations shall be crimped and covered with self-sealing type heat shrink tubing.
- 12.35 All wire runs that require junctions shall terminate to weather-tight “buss bar” terminals.
- 12.36 “Buss Bar” terminals shall be secured with locking type hardware to prevent loose connections
- 12.37 All “Buss Bar” terminals shall be coated/sealed.
- 12.38 Ultrasonic welding is not acceptable without prior FDNY approval.
- 12.39 Combination “crimp and self-sealing” butt connectors and terminals shall be acceptable only when a “home run” of the wiring is not possible. Further details shall be discussed at the Preconstruction Conference.
- 12.40 All exposed connections/terminations shall be covered with “liquid electrical tape”. Further details shall be discussed at the Preconstruction Conference
- 12.41 No “wire nuts” or “twisted” wires shall be acceptable.
- 12.42 No exposed wiring shall be acceptable.
- 12.43 Wiring shall be concealed to prevent unauthorized access. This shall prevent the ability to make splices for unauthorized electrical equipment.

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.44 All wire ends connected to a replaceable device shall have 6 inch pigtails, minimum.
- 12.45 Grounding straps between cab & frame, body & frame and separate grounding straps on appliances and / or circuits shall be provided as directed by FDNY
- 12.46 All circuit breakers, terminals & other electrical panels shall be easily accessible & protected inside enclosures made for this purpose, with hinged cover panels equipped with key lock. Panel lock by South Co. Vice Action Lock™, or equal, part #E3-15-15; key part #E-3-5-15. All relays, switches and controls shall be properly and permanently labeled to show their function. No breaker or relay shall be mounted upside down.
- 12.47 FDNY shall determine which accessories and installations may require a relay to carry the electrical load.
- 12.48 All electrical components, relays shall be identified as to function by a permanent label affixed to its' mounting location.
- 12.49 All circuit breakers shall be only automatic reset type. It is the intent of FDNY to provide circuit breaker protection on all circuits to protect wiring and equipment from damage. The vendor shall provide a proposed layout of all circuits and circuit breakers at the Preconstruction Conference for FDNY review.
- 12.50 As directed by FDNY, waterproof junction boxes and conduit shall be provided: junction box shall be Hoffman™ P/N A-806NP or equal, clamp cover type and cable / conduit protection system shall be. PMA AG™, or equal. Wiring shall have the ability to be easily split to facilitate easy removal at a later date if needed. FDNY shall direct and approve those locations requiring this system.
- All connections inside junction boxes shall be made with “buss bar” type strips. Each terminal permanently labeled to identify function of wire.
 - The junction box (mentioned above) shall be used in additional locations wherever deemed necessary by FDNY to create an easily serviceable junction. All runs through any conduit shall be “Home Runs”.
- 12.51 All electrical wiring that passes through the swivel shall have Molex™, or equal, weatherproof, locking, pin type connectors to permit easy diagnosis and repair. All wiring shall be color coded for ease of diagnosis. The swivel shall be equipped with a minimum of two (2) pairs of spare circuits. In addition, there shall be a test port located as directed by FDNY to aid in diagnosing the swivel wiring.
- 12.52 Back-Up Alarm: One (1) Ecco™ p/n SA914, or equal, solid state electronics, automatic volume adjustment from 87 to 112 decibels, shall be provided. Properly mounted at rear of body, in a location approved by FDNY, to ensure automatic operation, and be protected from the elements. Shall be activated automatically when transmission is in reverse mode.

12. 12 VOLT ELECTRICAL (CONTINUED):

- 12.53 360 Degree Camera System: Provide and install a Fire Research™, or equal, 360-degree color back-up camera and monitoring system with sound feature. Minimum screen size shall be 7” as measured diagonally. The system shall also include a “spotter” feature for predicting where the jacks/outriggers will land when deployed. The camera system shall have graphical overlay technology, permitting the operator to view the apparatus in perspective to objects and obstructions around it. The screen view shall incorporate grid lines showing the approximate distance the apparatus is from these obstructions/fixed objects. The system shall activate when the apparatus transmission is placed in reverse or the turn signals are activated as well as provide a “quad view” on the screen. Component selection, layout, exact operation and final installation shall be directed and approved by FDNY.
- 12.54 Provide and install one Kenwood™, or equal, AM/FM stereo radio with weather band feature, two (2) speakers, and clock. Final location shall be approved by FDNY.

13. CAB:

- 13.1 The cab shall be the manufacturer's highest quality custom designed four (4) door split tilt cab design. It shall provide seating for a total of six (6) personnel and be specifically designed for fire service. Cab design shall be approved by FDNY.
- 13.2 Cab Structure: The cab shall be a “roll cage” design for maximum personnel protection and cab longevity.
- The cab substructure shall be a heavy-duty design.
 - The cab shall be manufactured with multiple reinforcements in the cab front, floor, walls and roof.
 - The cab roof shall have full length left to right support tubing as well as additional front to rear supports to form a grid type pattern.
 - The cab roll cage structure shall be constructed of 3/16” minimum stainless steel components.
 - As deemed necessary by FDNY, heavy wall tubing shall be used in the construction of the cab.
Note: Thicker wall tubing may be required in certain areas at the discretion of FDNY.
 - Due to the various cab designs available as well as FDNY’s duty cycle, further details of the “roll cage” design, including material thickness and placement of supports shall be discussed at the Preconstruction Conference. Final design shall be approved by FDNY.
- 13.3 It is the intent of the FDNY to only accept a cab made of 3CR12 series stainless steel construction.
- 13.4 A full description including grade, thickness and tensile strength of the proposed material for cab construction shall be supplied at the Preconstruction Conference.
- 13.5 Detailed engineering drawings of the cab showing power plant arrangement, and cab mounting configuration shall be supplied at the Preconstruction Conference.

13. CAB (CONTINUED):

13.6 Cab Dimensions:

- The back wall of the cab shall measure approximately 84” from the center of the front axle.
- The cab shall have an approximate overall length (skin to skin) of 154”.
- The cab shall have an inside minimum width of 91” and an outside maximum width (skin to skin) of 96”.
- Interior floor to ceiling height in the front cab shall be approximately 60” minimum and shall be approx. 66” minimum in the rear (crew) portion of the cab, with exception of the notched roof area. If it is necessary for the roof to be raised to achieve this height, the maximum allowable dimension shall be eight (8) inches. **NOTE: The cab floor must be flat.**
- The rear cab bulkhead wall shall be notched to provide mounting for the aerial ladder cradle. It is the intent of the FDNY to provide maximum cab space for firefighters.
- The door opening shall be a minimum height of 72”. The entrance step wells to the chauffeur’s and officer’s positions shall be a minimum of 24” wide, the crew entrance step wells shall be a minimum of 34” wide, excluding aux. steps.
- If deemed necessary by the FDNY, an additional step may be added inside cab at the battery box cover area to facilitate access/egress.
- All step wells shall be provided with bolted, framed Bustin™, or equal, overlay grating with ½” clearance to wash out dirt from under grating and prevent entrapment of debris.
- There shall be an additional bolt-on non-slip aluminum step installed under each cab door. Step shall be a “breakaway” design to prevent damage to the cab. Final design shall be approved by FDNY.

- 13.7 The fixed crew cab portion shall be mounted in a minimum of six (6) places. Mounts shall be of the rubber isolating type.

13. CAB (CONTINUED):

- 13.8 Cab Tilt: The cab shall tilt a minimum of 45 degrees for normal servicing of the engine and other equipment. The tilt cab locking system shall be a two-point type that locks automatically when the cab is lowered into its nested position. The cab tilt open device shall be painted **day glow orange**. The cab tilt package shall be custom designed for safety and ease of apparatus maintenance. The hydraulic tilting system consists of two (2) heavy-duty double acting cylinders equipped with holding valves at the cylinder base in case of any failure in the operating mode. The power supply shall be a high efficiency electric over hydraulic system with an integral mechanical override in case of battery failure. All components and parts shall be designed for installation with a minimum of 3 to 1 safety factor based on current S.A.E. standards. A secondary positive pin-type latch shall be provided at the rear of the tilt portion of the cab. Design shall be approved by FDNY.
- 13.9 Cab Tilt Remote Control: A remote control shall be provided utilizing a 15' cable with a handheld pushbutton device. This device shall be hardwired and stored in a compartment as directed by FDNY.
- 13.10 The tilt cab controls including, but not limited to, relays, solenoids, breakers and buss bar terminals shall be mounted in a waterproof, readily accessible enclosure. Final design and placement shall be approved by FDNY.
- 13.11 Provisions shall be made for the tilting of the cab in the event of total system failure. Two screw-in, threaded, removable eyes shall be installed. These eyes shall be capable of supporting the full weight of the cab. Location shall be directed at the Preconstruction Conference. The two eyes shall be shipped loose, and bolts shall be provided to cover the bolt eye holes.
- 13.12 Cab Open Lock: This shall consist of a metal channel device that automatically drops over the extended rod of the right-side hydraulic lift cylinder thereby preventing its retraction. The safety channel must be manually released by the operator through the use of a remotely mounted lever or cable.
- 13.13 Secondary Cab Securing Device: The apparatus shall have a secondary manual securing device that locks the cab into the "down" position. There shall be a tethered pin, and hydraulic valve/pivoting handle assembly on each side of the cab. The pin hole size shall be 11/16". When engaged, the pivoting handle shall prevent the pin from "walking" out of position. The valve shall disable the hydraulic system for the tilt cab as an additional safety. Final design, layout and location of all components shall be directed by FDNY.
- 13.14 Tilt Cab Seal: There shall be a positive seal between the forward and rear cab sections. The seal shall not be visible from inside of the apparatus. There shall be a primary and secondary means of sealing the four contact surfaces. If an inflatable type seal is used, an additional isolated air tank shall be provided. Final sealing system design shall be approved by FDNY. See Section 6 for information on the tank size.

13. CAB (CONTINUED):

- 13.15 Switches and controls mounted in the ceiling shall be recessed.
- 13.16 The cab ceiling shall be 1 ½" thick minimum insulation with heavy duty **gray** vinyl covering.
- 13.17 Any intrusions into the cab interior shall be sealed from outside elements.
- 13.18 The roof shall be adequately braced to support approx. 2 PSI, min, and shall incorporate an 8" raised roof with a "dropped center" provision for the bedding of the aerial ladder. Design shall be approved by FDNY.
- 13.19 The roof shall have additional panels over the seating areas covered in 12 gauge minimum 304 stainless steel material. These panels shall be held in place using welded studs on the cab and properly graded hardware. The roof shall be covered in **gray** Linex™, or equal. Exact texture, color, area covered, and material selection shall be directed by FDNY.
- 13.20 The sides of roof shall be provided with an integral drip molding that runs down the full length of the cab with a "dog leg" past the lower windshield. Further details shall be discussed at the Preconstruction Conference.
- 13.21 E-Z Pass™ holder and bracket mounted on roof, location approved by FDNY.
- 13.22 Two-Way Radio Antenna Access: Provide a minimum of six (6) antenna access points that are each a minimum of 4" in diameter with cover plates. For ease of handling, no individual access panel shall exceed a size of 6" x 24". Panel design shall be approved by FDNY. In addition, there shall be a full-length exterior antenna box mounted as directed by FDNY. Further details shall be discussed at the Preconstruction Conference.
- 13.23 Two-Way Radio Compartment: Dedicated radio compartment(s) shall be provided for the mounting of FDNY's radio equipment. Compartment(s) shall be as large as possible and it shall be locked with a Southco™, or equal, #E3-26-819-15 "Radio Compartment Key" to prevent unauthorized access. They shall also be illuminated with LED lights. These compartments shall also be vented to protect the equipment from overheating. In addition, if deemed necessary, fans shall be added to these compartments to help prevent equipment overheating. Due to the various chassis configurations available, the location and layout of these compartments shall be discussed at the Preconstruction Conference. Final design and location shall be approved by FDNY.

13. CAB (CONTINUED):

- 13.24 Engine Enclosure: The engine enclosure shall be constructed of stainless steel. The engine cover shall be angled inboard on each side. The angled break shall start 2.5” below the top surface of the seat cushion. The top forward portion of the hood shall have a full-width switch / accessory area with a smooth inclined face.

Note: The intent is to provide maximum space for firefighters, including the ability to don SCBA gear without restriction. Minimum hip room shall be no less than 26” as measured across the rear portion of the seat across the full travel of the seat. Nothing shall protrude past the vertical cab door flange. Final design, layout, and installation of all seat related components shall be approved by FDNY. The vendor may be required to modify the engine enclosure as necessary to provide this space. Further details shall be discussed at the Preconstruction Conference.

- 13.25 Engine Enclosure Access Panel(s): These panels shall be provided so that routine fluid checks and fills can be made without tilting the cab. There shall be a non-locking “D-Ring” handle used to secure the panel in the closed position and metal chains to limit its travel. Special attention shall be given to the sealing and securing of these panels.
- 13.26 Engine Enclosure and Cab Insulation: The engine hood and cab shall be insulated to effectively control noise level to a maximum of 90 DBA when the apparatus is driven at a constant speed of 45 mph, as well as effectively control heat from permeating into the cab.
- Engine hood and cab insulating material on the engine side of the engine tunnel and cab floor shall be one (1) inch thick minimum composite, with a heat rejecting, rip-stop, facing and built in lead shield for noise reduction.
 - Insulating material shall be sandwiched between the stainless steel engine enclosure and cab interior engine tunnel cover. Thermal type foam of 1/2” thick minimum in the angled sides and 1” thick minimum between the top surfaces shall be provided to reduce surface temperature of the interior engine cover.
 - As directed by FDNY, vertical surface areas inside the cab, including the step wells shall be scuff protected with Linex™, or equal. Color shall be **gray**. Exact color, texture and exact coverage area shall be approved by FDNY. Further details shall be discussed at the Preconstruction Conference.
- 13.27 All vertical surface areas inside the cab, including the step wells shall be scuff protected with Linex™, or equal. Color shall be medium **gray**. Texture shall be approved by FDNY.

13. CAB (CONTINUED):

13.28 Cab Floor, Vertical Risers, and Scuff/Contact Areas: The cab floor, vertical risers, the area under the crew seats, and any foot contact area shall be constructed of a stainless-steel skin.

- Stainless steel skin shall be covered by 3/8" thick minimum floor insulation.
- The cab floor shall be twelve (12) gauge stainless steel tread plate.
- All vertical contact areas shall be twelve (12) gauge aluminum tread plate as directed by FDNY.
- All tread plate surfaces shall be covered with Linex™, or equal. Color shall be medium **gray**. Color and texture shall be approved by FDNY.
- Cab side walls shall be twelve (12) gauge aluminum and covered with Linex™, or equal. Color shall be medium **gray**. Color and texture shall be approved by FDNY.

13.29 Side and rear walls shall have 1 ½" thick minimum insulation and be covered with heavy pebble grain finish rubberized material with insulated backing. Exact coverage area shall be directed by FDNY.

13.30 Provide Rosco™ "930FDNY", or equal, **black** adjustable sun visors that block out 100% of the sun's rays. They shall be installed on each side of cab interior. Each visor shall be full width, and equipped with an integral visor organizer/pocket for storage of various items. Visors shall be capable of full motion without interference with other cab mounted components. Final design, equipment selection and installation shall be approved by FDNY.

13. CAB (CONTINUED):

13.31 Mirrors:

- Stainless steel exterior rear view mirror kits shall be installed on cab doors. Two (2) Rosco™ model “6676 Series”, or equal, including upper and lower mirror heads as well as mounting arms. An additional Rosco™, or equal 6” stainless steel mirror shall be installed on the right hand lower mirror bracket as directed by FDNY.

Note: Due to the various cab designs available, further details shall be discussed at the Preconstruction Conference.

The mirrors shall be designed and installed in a manner that prevents vibration. Final design and installation of all components shall be approved by FDNY.

- One (1) Rosco™, or equal mirror with bracket mounted on the officer’s door to serve as a “down view” mirror. Location and type shall be approved by FDNY.
- One (1) Rosco™ P/N 801DSSP, or equal, eight (8) inch diameter, stainless steel, convex mirror. It shall be mounted on the right front outside edge of cab, as far to the right as possible, above windshield on a stainless steel mounting bracket, suitable for viewing front of apparatus from cab interior.
- One (1) Rosco™, or equal, six (6) inch diameter convex stainless steel mirror on the right side of the cab, to view blind spot, on a single stainless steel arm mounted off lower cab. Mounting arm shall be “L” shaped and provide the proper adjustment capability for use by the officer. Also, if deemed necessary by FDNY, an additional six (6) inch stainless steel mirror shall be installed to function as a “crossover” mirror. Further details shall be discussed at the Preconstruction Conference.
- Locations and mountings of all mirrors shall be approved by FDNY.

- 13.32 The fender and the fenderette shall be constructed of stainless steel and bolted in place. The fenderette shall be a multiple piece design and be fully polished. The inner fender wells shall be separate from the fenderettes to allow for easy removal. They shall cover the full radius of the tire and be of split design to permit tilting of cab. Mud guards shall be provided. The wheel wells shall protrude a minimum amount to provide tire coverage. Final design of fenders and fenderettes shall be approved by FDNY.

13. CAB (CONTINUED):

13.33 Cab Doors:

- Cab doors shall be fitted with double lock safety catches meeting all applicable safety standards. The opening around the door lock mechanism shall be kept to a minimum so as to prevent the accidental tripping of the lock mechanism.
- Lock levers shall be part of door lock mechanism. Doors shall not “slam lock”.
- Interior and exterior cab door latches shall be Trimark™, or equal, heavy duty paddle type latch.
- All four (4) cab doors shall be keyed the same. They shall be equipped with Trimark™, or equal, #202 locks. Each apparatus ordered shall be keyed the same to each other.
- Cab doors shall be mounted on heavy duty stainless steel full length “bolt on” piano hinges, approved by FDNY. **Welding of the hinges is not acceptable.** Bolts shall be ¼” minimum zinc coated grade 8, hex head. No part of the hinge shall be welded to the door or the door frame.
- Cab doors shall be double panel with inner panel of 14 gauge brushed finish stainless (no abs, padding, or painting shall be used on inside door finish).
- All crew cab door windows shall be equipped with an extra vertical bar for personnel safety as directed by FDNY. The bar shall be installed a manner that allows for sufficient clearance for a gloved hand, but does not present a pinch hazard. “Pinch point” placards shall be installed as directed by FDNY. Further details shall be discussed at the Preconstruction Conference.
- Cab doors shall be fabricated so that window regulator, lock assembly, and related items, are mounted to the inner door and not the door panel. Each door shall have three (3) easily removable inner door panels- one (1) to access regulator assembly, one (1) to access the exterior door handle and one (1) smaller panel to access the lock assembly. All door mechanisms shall be lubricated prior to assembly.

Note: the lock assembly panel shall be capable of being removed without removing the other two (2) panels described above. For ease of removal, the maximum size of a panel shall be half the overall size of the door panel. Panels shall provide access to the door lock release with the door closed in the event of lock failure. In addition, the panels shall be removable in the event the doors are stuck closed. Final design and installation of all door panels and related components shall be approved by FDNY.

- Interior of all cab doors shall be provided with reflective 18-inch reflective stop signs, W.H. Brady and Company™, model #94142, or equal. Each sign shall have 96 square inches of reflective surface area, and be bolted on.

13. CAB (CONTINUED):

13.33 Cab Doors (Continued):

- All doors shall be equipped with one (1) 5" nylon woven belt type door restrictor to allow the door to open to ninety (90) degrees. As deemed necessary by FDNY, angle brackets shall be installed in the belt restrictor area. Further details shall be discussed at the Preconstruction Conference.
- Heavy duty rubber push-on door weather stripping shall be installed on the door opening where it comes in contact with the door opening surface. Glued on weather stripping is unacceptable. Weather stripping shall have a stainless steel "edge guard" on rear portion of the front doors and the front portion of the rear doors to prevent snags and damage to the weatherstripping. Further details shall be discussed at the Preconstruction Conference.
- All cab doors shall have drain holes. Further details shall be discussed at the Preconstruction Conference.
- Horizontal Door Scuff Plates: All cab door openings shall be equipped with thin stainless steel scuff plates, which cover the bottom full width of each cab door opening.
 - Each horizontal scuff plate shall begin at the bottom exterior of the cab and wrap around to the inside of the stepwell to the first break.
 - They shall extend towards the front of the apparatus approx. one (1") inch past the door.
 - They shall also extend to the rear of the apparatus, ending flush with the vertical scuff plate at the rear of each door opening (described below).
 - On the rear doors, they shall meet the wrap around tread plate.
 - Final design and placement shall be approved by FDNY.
- Vertical Door Scuff Plate: There shall be a stainless-steel scuff plate, at the rear of each door opening. It shall cover the full length of the door opening, from top to bottom. It shall start at the first break inside the door opening and wrap around to the exterior cab skin. Final design and placement shall be approved by FDNY.
- Rear Cab Scuff Plates: The rear of the cab shall be 14-gauge stainless steel tread plate. Coverage area to be discussed at the Preconstruction Conference.

13. CAB (CONTINUED):

13.34 Cab Compartments: There shall be two (2) cab compartments (one (1) on each side) on the apparatus, located behind the crew doors. The chauffeur's side compartment shall have a ZICO™ "Walkaway" p/n KD-NY-FH-6-SF-CRS, or equal, bracket for SCOTT™ 45-minute air pack, with high cycle clip and short foot plate installed on a 250-lb slide tray for use by the chauffeur. Bracket setup shall be discussed at the preconstruction meeting. Compartment size shall be as large as possible to allow for easy access and maintenance. The officer's side compartment shall be used for storage of various firefighting gear. Final size and layout of both compartments shall be directed by FDNY at the preconstruction meeting.

13.35 Cab Windows:

- All glass shall be tempered safety glass and comply with all applicable FMVSS standards.
- All cab doors shall be equipped with power windows. The chauffeur's control shall be a two (2) button type control with the capability of operating both the chauffeur's and the officer's windows. All other control positions shall be a single switch control with the ability to operate the window at that seating position. All controls shall be within easy reach. Final system design, component selection and layout shall be directed and approved by FDNY.
- The crew cab shall be equipped with four (4) sliding side windows, two (2) located forward of each door and two (2) located behind crew doors and above cab compartments described above. All crew cab door windows shall be equipped with a vertical stainless-steel bar coated with **black** Linex™, or equal for personnel safety. Final design and location shall be approved by FDNY.
- All cab windows shall be tinted laminated automotive safety glass. The windshield and front cab windows shall be **green** tinted with a tint percentage of 30% (70% light transmission) and the rear crew cab windows shall be **gray** tinted with a tint percentage of 60% (40% light transmission).

13. CAB (CONTINUED):

13.36 Cab Grab Bars and Grab Handles:

- Grab handles and rails shall be installed to facilitate entry into cab.
- Grab handles and rails shall not interfere with the operation of door handles.
- All grab railings and handles throughout the apparatus shall be of non-slip, non-rotating stainless steel knurled type, except as noted or directed by FDNY.
- Cab and Crew Doors (Exterior): One (1) knurled “non-slip” stainless steel vertical grab handle or railing installed on each cab door post. Grab handles shall be recessed into cab at the rear of each cab door.
- Cab Back Wall (Exterior): One (1) knurled “non-slip” stainless steel grab handles shall be provided on the officer’s side to facilitate access to the deck area. See Section 15 for body grab handles.
- Front Cab Doors (Interior): One (1) grab handle installed on the inside of each front door. Handle shall be an Austin Hardware™ TH555 CH, or equal.
- Front Cab Posts (Interior): Two (2) Hansen International™ #F340SXXXXXX, or equal, grab handles shall be provided. Mount one (1) on the chauffeur’s side “A” post, and one (1) on the officer’s side “A” post, as directed by FDNY.
- Crew Cab Doors (Interior): At each crew door, Hansen International™ #F340SXXXXXX, or equal, handles, mounted horizontally on the interior door surface. Location shall be directed by FDNY.
- Provide and mount five (5) hooks / brackets to hold mask face pieces, installed to the left of the respective seating position. The officer’s bracket shall be installed on an adjustable low profile stainless steel Unistrut™ or equal track. Location and type shall be to be discussed at pre-construction conference and approved by FDNY.
- The front cab engine cover shall have grab rails on the left and right sides, covered in **black** LINEX™ or equal.

13. CAB (CONTINUED):

13.36 Cab Grab Bars and Grab Handles:

- The rear portion of the engine cover (behind the officer's map box) shall be equipped with a continuous grab rail that runs full perimeter. The clearance between the engine cover and the lowest edge of the grab rail shall be a minimum of 3 ½". This cover shall be finished in **black LINEX™**, or equal. The texture shall be approved by FDNY.
- Final design, type and location of grab railings and handles shall be approved by FDNY.

13.37 FDNY Hook Holders: Two (2) double (four (4) total capacity) FDNY approved double hook holders shall be mounted on both sides of the body as directed by FDNY. The holder shall be of aluminum construction. If these holders are mounted on the doors, then the doors shall have full length brushed finish stainless steel scuff plates installed. Final design and installation of all components shall be approved by FDNY.

13.38 Seating:

- Cab shall provide seating for six (6) personnel- seating for officer and chauffeur in front section, seating for four (4) firefighters in crew cab area. Fore and aft seat placement shall be approved by FDNY.
- Two (2) rear facing and two (2) forward facing crew seats shall be mounted outboard. **All riding positions shall allow for maximum hip and shoulder room. There shall be a minimum dimension of 26" (measured from the front edges of the seat cushions folded down) between these crew cab seats. Final location shall be determined by FDNY.**
- All seating positions shall be equipped with approved three-point restraint systems and be ergonomically correct. All seating positions (except the chauffeur's and officer's positions) shall have a dual retractor system. IMMI™, "Ready Reach", or equal, system shall be provided in cab seating positions as deemed necessary by FDNY. All seat belts shall have a belt height adjuster. Seat belts shall be **bright orange** in color. Seat belts shall be the manufacturer's most updated design. The vendor shall supply decals at each cab door position on the apparatus stating, "Occupants must be seated and belted when apparatus is in motion". Seat belt receiver length shall be discussed at the Preconstruction Conference. These shall be in addition to the seat belt decals specified in section 24.
- The apparatus shall be equipped with a seat belt monitoring system. The system shall have an audible alarm and a display board indicating which belts in the apparatus are unfastened. The indicator light and alarm shall stay activated as long as the belt remains unfastened. Further details of operation and system design shall be discussed at the Preconstruction Conference.

13. CAB (CONTINUED):

13.38 Seating (Continued):

- All seat mounting and restraint systems certified in compliance with all applicable FMVSS, DOT requirements including, but not limited to, FMVSS 208, 209, 210. The length of the receiver shall be discussed at the Preconstruction Conference. It shall also be attached to the inboard side of the seat, unless otherwise directed by FDNY. Final design shall be approved by FDNY.
- All seat coverings shall be heavy duty Bostrom™ “Durawear Plus”, or equal, 1800# Nylon, **black** in color. All seats shall also have Bostrom™ “Zip Clean” or equal removable and washable seat covers.
- Chauffeurs seat shall be a Bostrom™ “134001-0712F”, or equal, knee action seat and shall have fore and aft adjustment capability. It shall be equipped with air suspension with chauffeur's control located at seat base area.
- Officers seat shall be a Bostrom™, High-Back “350 FDNY Series SCBA Air 30”, model “210008-0339L”, or equal with air suspension. Seat shall have fore and aft adjustment capability. Officer's control shall be located at the seat base area. This seat shall also have a storage area in the base of the seat. Install a two (2) stud (positive and negative) buss bar under the officer's seat wired battery positive. Further details shall be discussed at the Preconstruction Conference.
- Two (2) rear facing seats in the crew cab shall be Bostrom™, high-back “350 FDNY SERIES SCBA”, or equal.
- Two (2) front facing seats in the crew cab shall be Bostrom™, high back “300 CT FDNY SERIES SCBA”, or equal, and be “flip-up” type.
- **NOTE: The intent is to provide adequate space for maintenance and maximum space for firefighters including the ability to don SCBA gear. Full conceptual drawing shall be provided at the Preconstruction Conference. Final layout subject to FDNY approval.**
- Six (6) Zico™ “Walkaway” P/N KD-NY-FH-6-SF-CRS, or equal, brackets for Scott™ 45-minute air pack, with high cycle clips and short foot plate installed on these brackets, shall be provided. One (1) mounted in officer's seat, one (1) mounted in each of the four (4) crew cab seats, and one (1) shipped loose. Brackets shall be oriented in a manner that provides maximum hip room. All seat mounted brackets shall have a heavy duty support and made of heavy duty material that will withstand FDNY's duty cycle. Further details of the bracket setup shall be discussed at the preconstruction meeting.

13. CAB (CONTINUED):

- 13.39 Crew Cab Storage Area Module: There shall be a fabricated storage module situated in the crew cab area for carrying various pieces of firefighting gear. The construction of this compartment shall be designed to keep these items from shifting during transit. This storage unit shall be located between the forward-facing crew seats.
- The storage module shall be a three (3) tiered unit. It shall be coated in **light gray** Linex™, or equal.
 - There shall be two (2) fixed trays with lips to retain the equipment during transit. The bottom tray shall have an approximate 4.5” high lip and the middle tray shall have an approximate 3” high lip, both with a “rolled” full perimeter edge. The top portion of module shall have a semi-smooth surface with less “grit” than the rest of the module. Degree of “grit” to be discussed at the Preconstruction Conference.
 - The back wall (above the semi-smooth surface) shall be used for mounting various pieces of two-way radio equipment.
 - The module (both sides and front) shall have On Scene™, or equal **black** webbing style straps with lift style buckles.
 - There shall be a wraparound grab handle coated with **black** Linex™, or equal around the top portion of the storage module.
 - There shall be a fabricated aluminum tray with a rolled edge and a 3” lip that completely encloses the top portion of the module and can be mounted into place if so desired. This shall be shipped loose.
- 13.40 Bulk Item Storage: There shall be two (2) fabricated storage trays (one on each side) between the front seats and the rear facing crew seats for bulk item storage.
- Each tray shall be bolted to the cab floor.
 - A removable bolt in box shaped sleeve/module shall be provided on top of each tray to extend the height for storage.
 - All surfaces shall be covered in **black** LINEX™ or equal.
 - Final dimensions, layout, and further construction details shall be discussed at the Preconstruction Conference.
- 13.41 Cab Dash: It shall be low mount for maximum chauffeur and officer visibility. All controls shall be fully illuminated. Final dash layout shall be approved by FDNY.
- 13.42 Cab Overhead Console: It shall be high mount for maximum chauffeur and officer visibility. All controls shall be fully illuminated. Final layout shall be approved by FDNY.
- 13.43 Overall Height Placards: There shall be two (2) overall height placards, one (1) on the officer’s side, one (1) on the chauffeur’s side. These placards shall be approximately 2.5” high by 4” long, with numbers 1” high, minimum with proper letter height for visibility.

13. CAB (CONTINUED):

13.44 Fluid, Maintenance and Lubrication Placard: A permanent engraved plate shall be mounted as directed by FDNY which shall specify the quantity and type of the following used in the apparatus:

- Engine oil
- Engine coolant
- Transmission Fluid (Dry Fill and Service Fill)
- Auto lube grease
- Power steering fluid
- Drive axle oil
- Fuel
- Diesel exhaust fluid
- Hydraulic ladder oil
- Cab tilt fluid
- Generator fluid
- Windshield washer fluid
- Tire inflation info
- A/C refrigerant oil capacity
- A/C refrigerant charge
- Paint information
- Drive belt manufacturer and part number
- Engine model and serial number
- Transmission model and serial number
- Front and rear axle models and serial numbers
 - Driveline retarder
- Generator model and serial number
- Aerial ladder model and serial number

This plate shall be product specific. Chassis manufacturer shall also list all points on the apparatus that require lubrication which are not serviced by the auto lube system.

13. CAB (CONTINUED):

13.45 Cab Switches and Controls:

- 1) One (1) battery-disconnect switch (as described in Section 12).
- 2) One (1) keyless ignition switch.
- 3) Two (2) momentary starter buttons.
- 4) One (1) three-way headlight switch (as approved by FDNY).
- 5) One (1) instrument lamp dimmer switch.
- 6) One (1) windshield wiper switch with delay feature (integral style switch is acceptable).
- 7) One (1) “cab to rear” warning buzzer momentary push button.
- 8) One (1) air parking brake control (as described in Section 6).
- 9) One (1) electric fuel pump momentary switch.
- 10) One (1) foot pedal on the chauffeur’s side for the air horn.
- 11) One (1) switch on chauffeur’s side for siren brake.
- 12) Three (3) foot pedals on officer’s side for siren, siren brake and air horn.
- 13) HVAC controls / switches.
- 14) One (1) “set up” spot light momentary switch for jacks.
- 15) One (1) three-way switch for regeneration inhibit.

NOTE: The following require a **red** “flip cover” to prevent accidental activation:

- 16) One (1) switch for emergency hydraulic power.
- 17) One (1) switch for right auxiliary parking brake control located on officer’s side.
- 18) One (1) switch for emergency engine shut-down.
- 19) One (1) switch for the emergency engine shut-down reset.
- 20) One (1) switch for differential lock.
- 21) One (1) switch for interaxle lock.
- 22) One (1) deep mud/snow switch.
- 23) One (1) engine shutdown reset.
- 24) One (1) “door open” alarm disable switch.

NOTE: The following require a **green** aircraft type cover which **locks** the switch in the on position when activated, located to right of chauffeur:

- 20) One (1) switch for generator PTO (shall be labeled ‘ON/OFF’).
- 21) One (1) switch for aerial PTO. Aerial PTO switch shall be a heavy duty toggle switch.
- 22) One (1) switch for front brake lock.

All switch, cover and pedal type(s) and location(s) shall be approved by FDNY. In addition, FDNY shall direct the naming/labeling of all switches.

13. CAB (CONTINUED):

13.46 Cab Rocker Switch Panel:

A separate illuminated switch panel shall be provided in the cab that is accessible to the chauffeur and officer. It shall incorporate a minimum of ten (10) pilot lit, properly and permanently labeled, heavy-duty rocker switches (design, type and location approved by FDNY). They shall be laid out from left to right, labeled in the following order:

- 1)---Response Lights
- 2)---Front Flashers
- 3)---Compartment Lights
- 4)---Air/Electric Selector Switch
- 5)---Brow Light
- 6)---Stereo
- 7)---Alley Lights
- 8)---Spare*
- 9)---Spare*
- 10)---Spare*

* NOTE: The vendor shall supply one (1) spare switch in positions #8, #9 and #10.

13.47 Cab Gauges: Cab shall include, but not be limited to the following.

All gauges shall be backlit, with the exception of the LED voltmeter and the air filter restriction indicator. Note: A digital display system for all of the below mentioned functions shall also be acceptable. Type and location shall be approved by FDNY.

- 1) One (1) electronic tachometer.
- 2) One (1) electronic speedometer, on the chauffeur's side.
- 3) One (1) electronic speedometer on officer's side (a digital speedometer may be acceptable with prior FDNY approval).
- 4) One (1) dual, brake air pressure gauge(s).
- 5) One (1) digital voltmeter gauge, Autometer™ #6393, or equal.
- 6) One (1) Stewart Warner™, or equal analog ammeter with a positive and negative 500-amp scale.
- 7) One (1) engine coolant temperature gauge.
- 8) One (1) fuel level gauge.
- 9) One (1) diesel exhaust fluid level gauge.
- 10) One (1) electronic engine oil pressure gauge.
- 11) One (1) air filter restriction indicator.
- 12) One (1) engine hour meter (to read **actual** engine run hrs. only).
- 13) One (1) aerial hour meter.

13. CAB (CONTINUED):

13.48 Cab Warning / Indicator Lights:

Cab shall include, but not be limited to, the following properly and permanently labeled warning / indicator lights. Type, size, and location shall be approved by FDNY.

Red lights for the following:

- 1) Primary low air pressure (non-flashing Weldon™ # 9186-2300-10, or equal, LED)
- 2) Secondary low air pressure (non-flashing Weldon™ # 9186-2300-10, or equal, LED)
- 3) Parking brake applied
- 4) Officer's emergency parking brake switch activated
- 5) Seat belt warning lights
- 6) Low coolant level
- 7) High coolant temp
- 8) Emergency engine shut down activated
- 9) Stop engine
- 10) Low system Voltage
- 11) ABS failure
- 12) Water in fuel
- 13) Driveline retarder lights
- 14) Jacks not nested
- 15) Cab not nested and locked
- 16) Ladder not nested
- 17) High system Voltage
- 18) Front brake lock
- 19) Differential lock
- 20) Interaxle lock

Green lights for the following:

- 1) Master battery switch "ON"
- 2) Ignition switch in "RUN" position
- 3) Directional indicator lamps
- 4) PTO engaged
- 5) PTO enabled
- 6) Aerial active

13. CAB (CONTINUED):

13.48 Cab Warning / Indicator Lights (Continued):

Amber light for the following:

- 1) Check engine
- 2) Check transmission
- 3) High transmission temperature
- 4) Low auto lube grease level
- 5) Electric fuel pump activated
- 6) Automatic traction control (ATC)
- 7) Generator active

Blue light for the following:

- 1) High beam headlights

13.49 Cab Audible Warnings:

Cab shall be equipped with an audible warning system that will sound whenever the warning light for one or more of the listed below conditions are met. All of the below shall be connected to a single device, with the exception of the “open cab / compartment door” indicator- this shall have its own device with a different sound. Mounting locations and types of warning devices (including sound type), shall be approved by FDNY.

- 1) Low air pressure (primary and secondary air).
- 2) Low engine oil pressure.
- 3) High coolant temp.
- 4) Low coolant level.
- 5) Low system Voltage.
- 6) High transmission temp.
- 7) “Stop Engine” light activation.
- 8) Water in fuel.
- 9) Cab not nested and locked.
- 10) Open cab / compartment door*

* There shall also be a momentary shut off device that turns off the compartment door open buzzer. The buzzer shall reset with each ignition cycle. The warning light shall stay illuminated when the momentary shut off is activated. There shall also be a light that illuminates to indicate when the buzzer shut off device is activated.

13. CAB (CONTINUED):

- 13.50 Vehicle Data Recorder (VDR): Fire Research™ model # SBA743-A00, or equal, with audible warning device and USB port for data retrieval. This shall be provided onboard allowing for the download of data from the apparatus. There shall also be a momentary shutoff device provided that resets with each ignition cycle. Due to the various systems available, this shall be further discussed at the Preconstruction Conference.
- 13.51 An illuminated perimeter drawing of the apparatus indicating which door is ajar shall be provided. Warning light and audible alarm to activate if cab or any compartment door(s) is “open” when parking brake is released. Cab and compartment door “open” switches shall be of the magnetic type. Approved by FDNY.
- 13.52 Windshield Wipers: Shall be heavy-duty, 12 Volt powered, horizontal park type with two (2) speed & intermittent feature. A windshield washer shall be incorporated into wiper system. Wipers and washer shall be operated by a single switch, easily accessible to chauffeur. Windshield wiper and washer system shall completely clear the windshield when in use.
- 13.53 “Buzzer” Type Communication System: A 2-way, “buzzer” type communication system between the rear of apparatus and the chauffeur shall be provided- it shall contain two (2) “buzzers”, one (1) located in cab, and one (1) at rear of apparatus. It shall contain three (3) momentary push buttons; one (1) located at chauffeur’s area, and one (1) each side of rear area of apparatus. Rear switches shall have stainless steel protective guards. All the buttons shall be permanently labeled: 1=stop, 2=go, 3=back-up. **NOTE: The cab button shall activate the rear buzzer and the rear buttons shall activate the cab buzzer.**
- 13.54 An apparatus electric/air horn selector switch shall be provided on the dashboard in close proximity to the chauffeur, to permit operation of the air horn from the steering wheel.
- 13.55 Electric Horns: Two (2), meeting FMVSS and DOT requirements, shall be installed under front of cab.

13. CAB (CONTINUED):

13.56 Air Horn: shall be Grover™ #1510 or equal. Location and mounting of all horn components shall be approved by FDNY.

- It shall be easily serviceable / replaceable. No screen or cover in front of horn outlet.
- Horn shall be controlled by four (4) independent methods- the horn button in steering wheel, a foot switch at chauffeur's area, a foot switch at officer's area, and an "Emergency Use Only" switch on the exterior of the apparatus.
 - Foot Switches: Shall be Linemaster™ #632S, or equal. Exact locations shall be directed by FDNY at the Preconstruction Conference.
 - Exterior Air Horn Switch: There shall be a weatherproof momentary push button that activates the air horn. It shall be labeled "AIR HORN - EMERGENCY USE ONLY". This switch shall be located on the pedestal.
- Solenoid air valve shall be a Skinner™ "V-5", or equal
- The air horn shall remain operable at the full decibel rating for a minimum of thirty (30) seconds. In addition, the air horn shall build-up rapidly upon depletion of the air supply.

13.57 Siren Control:

- Siren shall be controlled by two (2) independent methods- the siren control box switch, and a foot switch at officer's area.
- Foot switch shall be LINEMASTER™ #632S, or equal. Exact location shall be directed by FDNY.
- Siren speaker and related items will be described fully in Section 22.
- Two (2) switches for siren brake shall be installed. One (1) shall be a LINEMASTER™ 491S, or equal, for use by the officer. One (1) rocker switch installed in the center panel which is accessible to both the chauffeur and officer shall also be provided. Switch installations and locations shall be approved by FDNY.

13.58 12V USB Ports. There shall be (1) port for the chauffeur, three (3) for the officer, and one (1) in each rear riding position. Each USB unit shall be able to charge both USB-A and USB-C devices. USB units shall have appropriate circuit breaker protection and be wired "hot".

13. CAB (CONTINUED):

13.59 Map/Document Holder Box: This shall be installed in the area between the officer and the chauffeur. This box shall be bolted to the engine hood and extend into the area behind the crew seats.

- The chauffeur's side of the box shall have angled slots facing forward with Velcro™, or equal straps. Two (2) dividers shall be provided. The slotted portion of the box shall measure approximately 7" high x 14" deep. The width shall be determined and discussed at the Preconstruction Conference.
- The officer's side shall serve as a storage area for equipment (no dividers), and shall also have Velcro™, or equal, straps. The top of this area shall be open. This side of the box shall measure approximately 7" high x 14" deep. The width shall be determined and discussed at the Preconstruction Conference.
- The entire box shall be coated in **black** Linex™, or equal. Box location, material selection and final installation shall be directed and approved by FDNY.

13.60 Officer's Desk/ Record Book Storage Box: The box under the writing console shall be divided with a 12" wide x 10" long x 4" tapering to 1" deep space directly under the writing console and a 2.5" wide x 9" long x 4" tapering to 3" deep space to the right of the space under the writing console and open to the top.

- The box under the writing console shall be constructed of aluminum. Compartment finish shall be determined and discussed at the Preconstruction Conference.
- Provide a 1" I.D. diameter by 3" long tube type pen holder mounted to the outside of the box. The pen holder design shall also prevent the pen from falling out of the holder the box shall have a 1/2" lip on the top of the rearward 4" face for the full width of the box.
- The lid shall be 12.5" wide over the 12" wide box space and hinged full width of the lid. The lid shall include a Lexan™ cover, gas prop, two (2) clipboard style holders, and one (1) latching mechanism. There shall be a Lexan™ cover will be retained by 4 countersunk screws and for retaining documents and other departmental paperwork.
- The writing console and box shall be illuminated by a SoundOff Signal™ model #EMPML001, or equal flexible neck LED light mounted on dash. Location and final installation subject to FDNY approval.
- There shall be provisions to install the current in use FDNY hand light next to this box. Further details shall be discussed at the Preconstruction Conference.

14. HVAC SYSTEM:

- 14.1 General Description: For optimum comfort in all weather, an automotive type climate control panel shall allow the chauffeur and / or the officer to control the heating, air conditioning, defrosting and ventilating functions for the forward portion of the cab. The front control panel shall be designed for ease of use. It shall include an air source switch (fresh / recirculating) and controls for air discharge location (mode), fan speed, and temperature. It shall also have a "MAX A/C" button to provide maximum cooling. All of the functions shall have an indicator showing what mode is on. The heater unit shall be located near the floor. No part of the HVAC system shall impinge on the cab floor area.
Note: System shall be manual controls. An electronic system is not acceptable.

Note: Due to FDNY's severe duty cycle and operating environment, proper HVAC system function is of critical importance. If it is determined that the HVAC system does not meet FDNY's requirements, the vendor shall be required to modify the system in any way necessary to meet FDNY's needs. Further details shall be discussed at the Preconstruction Conference.

- 14.2 HVAC Air Distribution: The HVAC system shall be properly ducted to provide consistent and even airflow to all seating positions. Blower motors shall be capable of producing 700 CFM minimum of free air.
- There shall be a minimum of eight (8) rear facing vents installed in the cab dash. Two (2) of these vents shall be used to defrost the chauffeur's and officer's side windows. Vents shall be rotatable and closeable.
 - Conventional defroster outlets shall be provided from the heater for directing warm air to the windshields. These shall be "slot" type, located at the bottom of the windshield.
 - The crew cab evaporator (described below) shall have a minimum of eight (8) air vents to allow for multi-directional air flow. Vents shall be rotatable and closeable. Four (4) of these vents shall be directed to the main portion of the crew cab, and two (2) vents each shall be provided on the left and right side.

14. HVAC SYSTEM (CONTINUED):

14.2 HVAC Air Distribution (Continued):

- All vents and outlets shall be built to the largest size possible and be capable of directing air flow in all directions. Final design, location and installation of all components shall be subject to FDNY approval.

Note: It is the desire of FDNY to accept an apparatus with metal diffusers. If these are not available, plastic diffusers are acceptable.

- The HVAC system shall have easily replaceable fiber and mesh filters. These filters shall be accessible through a door or panel. Final design and location shall be approved by FDNY.

14.3 Heater and Defroster: a 46,000 BTU, minimum, front heater and defroster shall be installed with a variable blower. A heater control valve shall be provided to shut off hot water when the air conditioning is called for. In addition, manual shut off valves shall be provided to shut off the system. These valves shall be ¼ turn and permanently and properly labeled with their function and direction of operation.

14.4 Crew Cab Heater: Crew cab heater(s) shall provide equal dispersion of heated air to all personnel.

- Heater unit(s) shall be one (1) heater unit of 30,000 BTU minimum output or two (2) heater units of 15,000 BTU minimum output each.
- System shall be powered by an illuminated three (3) speed rocker switch for the blower. In addition, the system shall have a rotary temperature control dial.
- A heater control valve shall be provided on the supply line to control the engine coolant flow into the heater core.
- There shall also be manual shutoff valves to shut off the system. The manual shutoff valves shall be ¼ turn and permanently and properly labeled with their function and direction of operation.
- All crew cab heater related components shall be mounted as directed by FDNY.

14. HVAC SYSTEM (CONTINUED):

14.5 Air Conditioning: The HVAC system shall be compliant with all EPA regulations and use R-134A or latest approved refrigerant. The cab and crew cab shall be equipped with an automotive type air conditioning system. The system shall consist of two (2) independent systems, and shall include but not be limited to: two (2) pad mounted compressors with two (2) dedicated serpentine belts, two (2) condensers, and two (2) evaporators. The cab evaporator shall be totally integrated into the HVAC system and have the ability to provide dehumidified air. The crew cab evaporator shall be ceiling mounted.

14.6 Rear Air Conditioning Control Panel: A manual style control panel shall be provided consisting of controls for fan speed and temperature. The panel shall be located on the evaporator unit. A drain system shall be provided inside the cab to allow for the removal of condensation. If a drain hose is used it shall be of Synflex™ type. A drain pump shall not be acceptable. All A/C tubing and hoses shall be protected from unauthorized access.

- Any portion of the HVAC system that protrudes into the crew area shall be protected by padding.
- Bulkhead type connections shall be used at all through roof & bulkheads.
- All hoses used in the air conditioning shall be “barrier” type construction for containment of the refrigerant with replaceable six foot (6’) “whip ends” as directed by FDNY.
- Hose fitting type shall be Eaton™ “E-Z Clip”, or equal. Hose design shall be approved by FDNY.
- The condenser(s) shall be low profile, dual fan compact design with dryer and pressure switch included. The condenser(s) shall be located on the cab roof. The condenser unit(s) and all roof mounted components shall be protected from damage with fabricated stainless steel tread plate cover(s). The fan shall be protected with a stainless steel framed cover.

14. HVAC SYSTEM (CONTINUED):

14.7 The A/C system shall conform to the following standards:

Relative humidity	Ambient air temperature (° F)	Refrigerant pressure (psi)	Air duct temperature (° F)
Above 30%	70	135-165 (high) 8-14 (low)	36-44
Above 30%	80	155-185 (high) 10-15 (low)	41-47
Above 30%	90	170-205 (high) 11-17 (low)	42-52
Above 30%	100	215-255 (high) 15-22 (low)	45-60
Above 30%	110	250-295 (high) 18-27 (low)	50-65

14.8 A/C fans shall be operable with the ignition on.

14.9 Condenser fan(s) shall come on when a/c is activated.

14.10 The HVAC system design, component selection, layout and installation shall be approved by FDNY.

14.11 Provide two (2) Haldex-Midland™ #BE29012, or equal, four (4) blade, 6.5" diameter 12 volt, 2 speed with individual controls, air circulation fans in the cab. Fans shall be all metal construction. They shall be mounted on 12-gauge stainless steel plates with 3/8" stainless steel bolts and locking Nylock™ nuts and have individual control switches. Installation and location shall be approved by FDNY.

15. BODY:

- 15.1 It is the intent of the FDNY to only accept a body made of 3CR12 series stainless steel construction.
- 15.2 The apparatus body shall be adequately secured to the chassis frame rails. The rear mounting shall incorporate bolts easily accessible through removable access panels in the body substructure.
- 15.3 A Nylon, or equal, full length, one-piece caged isolator shall be used between frame rails and underside of body, **wood will not be accepted**. Isolators shall be captured so as to prevent “walking” of the isolator out of position.
- 15.4 The body substructure shall consist of stainless steel, angle, tubing or channel – compartment floors shall be adequately supported. All compartments shall have full width/length “hat section” reinforcement supports.
- 15.5 The apparatus body shall be attached/mounted at a minimum of fourteen (14) points utilizing an underbody outrigger type mounting system. Further details shall be discussed at the Preconstruction Conference.
- 15.6 An enclosed channel shaped header shall be provided at the top of side compartments to accommodate all 12-Volt body wiring, permitting easy accessibility to wiring. The compartment door frame shall be of channel shaped double break design on the sides. The wheel well panels and door frames shall be set back 1" from outside edge of rub rails for protection of doors and body panels. All exterior compartments shall have stainless steel bolted on scuff plates. These plates shall run to the first break in the compartment door frame. Further details shall be discussed at the Preconstruction Conference.
- 15.7 Only stainless steel bolts and nuts shall be used in mounting exterior trim, hardware, or equipment. The use of pop rivets in any portion of the body and compartment construction shall not be acceptable, including attachment of trim or moldings. All seams in the compartments shall be sealed with continuous silicone base waterproof caulking sealants.
- 15.8 All compartment doors shall be mounted with Grade 8 zinc coated, 1/4” minimum, hex head cap screws and hardware.
- 15.9 All body sections shall use the same, appropriately graded and sized, mounting hardware.
- 15.10 All nuts, washers, and lock washers shall be same “grade” as the bolts on which they are used.

15. BODY (CONTINUED):

15.11 Body and Portable Ladder Slide Substructure:

- The body substructure shall be stainless steel, structural channel. A tubular style substructure shall also be acceptable. One quarter (1/4") thickness shall be provided regardless of the type of structure chosen. The substructure shall be full width of the chassis and welded to vertical compartment side sheets at each vertical divider.
- If the manufacturer's design is a torque box, it shall be steel and coated with Linex™, or equal. Color shall be discussed at the Preconstruction Conference. If a torque box is used, open areas shall be sealed to prevent the intrusion of water and road debris.
- Additional cross members shall be installed as necessary to support any equipment tray or walk-way areas. The complete substructure shall be primed and finish painted prior to body installation and prior to installation on the chassis frame rails in all hidden areas.
- Portable ladder storage shall be in an enclosed area below main aerial ladder and in between the left and right banks of exterior compartments, fully protected from road debris.
- Portable ladder storage shall be vertical with individual storage. Provide adequate clearance to easily remove ladders from rear of apparatus.
- Bottom ladder slides shall be lined with 1/4" thick Teflon, fiberglass composite, or polypropylene. Teflon/poly shall be attached using through bolt construction, hardware shall be countersunk and have nylon insert locknuts. Teflon/poly shall be properly captured to prevent "walk-out". Any hardware used to secure the Teflon/poly shall be easily accessible from the rear of the apparatus. They shall be installed in such a manner to provide both secure mounting and easy serviceability. There shall also be a hinged fold down panel that keeps the portable ladders in place during travel. This panel shall be coated with **gray** Linex™, or equal and shall also latch in place. Final design and layout shall be approved by FDNY.
- Each ladder storage bank area shall have a placard with the ladder size.

15. BODY (CONTINUED):

15.12 Module Fabrication and Design:

- Chassis mounted brackets shall be provided in critical areas as deemed necessary by FDNY for the support of the body. Further details shall be discussed at the Preconstruction Conference.
- Each compartment shall have four (4) drain holes, one in each corner. Seal edges of any hole to prevent corrosion.
- The compartment floors shall have a 1" minimum vertical rear break and 2-3/4" double break along rub rail attachment point for reinforcement of the floors. All compartments shall also have underslung supports for compartment durability and strength. Further details shall be discussed at the Preconstruction Conference.
- All exterior compartments shall have stainless steel bolted on scuff plates. These plates shall run to the first break in the compartment door frame. Further details shall be discussed at the Preconstruction Conference.
- Vertical divider panels in compartment fabrication shall be one-piece metal sections wherever possible to minimize welding.

15.13 Tread Plate Decking and Steps:

- The tread plate on the top of the forward body section and that of the main body shall be aluminum.
- All walking areas on the upper deck / decks shall be equipped with stainless steel bolt-on fully framed aluminum grating.
- All tread plate shall be undercoated prior to installation and bolted in place.

15. BODY (CONTINUED):

15.14 Turntable Access Steps:

- There shall be aluminum grating access steps to turntable area installed on each side of the rear body.
- Steps shall be angled to provide maximum “swing-out” clearance of apparatus.
- Steps shall be constructed of BUSTIN™, or equal, non-slip, open surface grating.
- Access steps shall be equipped with a swing-down grating step, using stainless steel swing support bolts. The swing-down step shall fit completely under the second step when stored and have a positive retention system. These steps shall also be wired into the “compartment door open” warning system to warn the operator if the step is left in the deployed position.
- Steps shall be of modular design and bolted to body to provide easy removal.
- Access stairways shall be NFPA compliant
- Final design and installation shall be approved by FDNY.

15.15 Handrail and Installation:

- The apparatus body shall be equipped with 1-1/4” diameter stainless steel knurled railings. Hand rails shall be mounted on both sides of the rear access steps, on each side of the body, leading up to the aerial pedestal. Handrails shall also be installed on the turntable as described in Section 20. Handrail design and installation shall be approved by FDNY.

15.16 Boxed Open Equipment Area:

- One (1) aluminum tread plate enclosed equipment box shall be supplied, located on top of the body, in the area under aerial ladder. The corners of the box shall be notched 1"x1" for water drainage. This area shall be equipped with a removable Herculite™, or equal, cover and the floor area shall be lined with removable plastic "Mateflex™" or equal, grating.

15. BODY (CONTINUED):

15.17 Rear Wheel Well Exterior Panel:

- The exterior panel of the wheel well enclosure shall be bolted in place with 1/4" stainless steel hex head cap screws and hardware. The main components and the support structure shall be 12-gauge 3CR12, or equal, stainless steel and the overlay shall be 14-gauge 304 stainless steel. These shall also be bolted in place with 1/4" stainless steel hardware. The construction shall be integral with the wheel well exterior panel.
- Provide two (2) 120 Volt Hubbell™ HBL5361, or equal, 5-20R 20A receptacles with covers -- one (1) each side of apparatus, located in the rear wheel opening aluminum tread plate area. These outlets shall be wired to properly sized breaker(s) in the electrical box. Final installation shall be approved by FDNY.
- The inner wheel well liner shall be constructed of 16-gauge stainless steel, bolted in place. Prior to installation, the complete wheel well area shall be undercoated.
- Both wheel wells shall have provisions to store four (4) 45 minute SCBA cylinders. Each compartment shall have dividers installed to prevent cylinder to cylinder contact. Both compartments shall have hinged doors with a locking "D" Ring handle using #1250 keys. Holders shall be part of the body, not the removable wheel well exterior panel. The bottom and the sides of each compartment shall be lined with rubber matting. Compartments shall have a 2" downward slant to help keep cylinders in place.
- The body wheel well openings shall be equipped with a round radius, extruded **black** rubber fenderette bolted in place, with stainless steel hardware.
- Mud guards shall be installed the rear wheel wells
- An additional full width Ultraguard™, or equal, mud guard shall be installed at the rear of the apparatus. It shall have a 1" clearance from the ground.

15.18 Fuel Fill:

- The apparatus fuel system shall be equipped with a spring-loaded fuel fill door, located in the rearward area of the left side wheel well. The door shall be stainless steel with a brushed finished. Permanent "diesel fuel" label at fuel door opening.
- Fuel fill shall be fitted with a PROTECTOSEAL™, or equal, fuel cap with a removable straight debris screen.
 - The screen shall not impede the flow of fuel into the tank.
 - The layout of fuel fill plumbing shall allow for rapid refilling of the fuel tank. Final selection and layout of all components shall be approved by FDNY.

15. BODY (CONTINUED):

15.19 Body Compartment Frame/Skeleton:

- Compartment construction for roof and walls shall be 12-gauge stainless steel.
- Floors shall be 10-gauge stainless steel. All compartment floors shall have a minimum 1" formed lip on the sides and back surfaces. Flooring shall include adequate support and bracing. Construction shall permit easy cleaning with a "sweep out" type design. Final design shall be approved by FDNY.

15.20 All compartments shall be provided with a minimum of two (2) metal louvered ventilation units in the lower back wall of the compartments. Each main body compartment shall be provided with two (2) stainless steel ventilation louvers that will not let road debris and road splash enter into the compartment. Location and final design shall be directed by FDNY at the preconstruction meeting.

15.21 Rub Rail:

- The protection of the apparatus body full length along the side of the apparatus is of critical importance. The rub rail assembly shall be of 2-1/2" x 1" solid polypropylene spaced out from the body 1/2" with properly spaced 1-1/2" diameter rubber bushings for each rub rail. These units shall be bolted to the exterior edge of the compartment floor. The use of "cage" nuts may be acceptable with prior FDNY approval. Further details shall be discussed at the Preconstruction Conference.
- The assembly shall blend into the front and rear corners for the body, and rolled radius of the wheel well assembly, with 45 degree angles on end of assemblies.
- The rub rail unit shall extend a minimum of 1-1/2" from compartment doors, with 2-1/2" vertical scuff surface.
- Final design and layout shall be approved by FDNY.

15. BODY (CONTINUED):

15.22 BODY COMPARTMENT IDENTIFICATION AND DIMENSIONS:

NOTE: Compartment measurements shall be denoted as follows:

Width: Inside width of compartment from wall to wall.

Height: Inside height of compartment from floor to ceiling.

Depth: Inside back wall of compartment to outermost edge of door frame.

Note: Due to the ongoing changes in the equipment carried by the FDNY, compartment dimensions may need to change at the time of build. This shall be further discussed at the Preconstruction Conference.

Left side compartments:

- Compartment #1 - First compartment, L/S adjacent to the cab, upper section shall be approximately 32" wide by 60.5" high, with an opening size of 27.5" wide by 59" high, pass through style. The lower section shall be approximately 24" deep from the back wall of this section.
- Compartment #2 - L/S upper between compartments #1 and #4 with approximate dimensions of 63" wide by 27.25" high by 42" deep (on the lower portion, upper portion shall be 23" deep) with an opening size of 58.5" wide by 25.75" high.
- Compartment #3 - L/S forward of intermediate wheel and below compartment #2 with approximate dimensions of 41.50" wide by 33" high by 24.5" deep with an opening size of 37" wide by 31" high.
- Compartment #4 - L/S above intermediate axle with approximate dimensions of 52" wide x 27.75" high by 23" deep with an opening size of 51.88" wide by 25.75" high.
- Compartment #5 - L/S above rear axle with approximate dimensions of 54" wide by 27.25" high by 23" deep with an opening size of 51.88" wide by 25.75" high.
- Compartment #6 - L/S above ground jack with approximate dimensions of 27" wide x 27.25" high by 23" deep with an opening size of 24.75" wide by 25.75" high.
- Compartment #7 - L/S between ground jack and turntable access steps with approximate dimensions of 32" wide by 59.5" high by 23" deep with an opening size of 27.5" wide by 58" high.

15. BODY (CONTINUED):

15.22 BODY COMPARTMENT IDENTIFICATION AND DIMENSIONS (CONTINUED):

Right side compartments:

- Compartment #8 - First compartment, R/S adjacent to the cab, upper section shall be approximately 32" wide by 60.5" high, with an opening size of 27.5" wide by 59" high, pass through style. The lower section shall be approximately 24" deep from the back wall of this section.
- Compartment #9 - R/S between compartments #8 and #10 upper area with approximate dimensions of 20" wide by 25.75" high by 23" deep with an opening size of 17.75" wide by 23" high.
- Compartment #10 - R/S forward of rear intermediate wheel with approximate dimensions of 43" wide by 60.5" high by 24.5" deep in the lower portion (the upper portion shall be 23" deep), with an opening size of 38.5" wide by 59" high.
- Compartment #11 - R/S above intermediate axle with approximate dimensions of 52" wide by 27.25" high by 23" deep with an opening size of 51.88" wide by 25.75" deep.
- Compartment #12 - R/S above rear axle with approximate dimensions of 54" wide by 27.25" high by 23" deep with an opening size of 51.88" wide by 25.75" deep.
- Compartment #13 - R/S above ground jack with approximate dimensions of 27" wide by 27.25" high x 23" deep with an opening size of 24.75" wide by 25.75" high.
- Compartment #14 - R/S between ground jack and turntable access steps with approximate dimensions of 32" wide by 59.5" high by 23" deep with an opening size of 27.5" wide by 58" high.

Open/boxed area compartment:

- Compartment #15 - this shall be an open boxed area below aerial ladder. It has the **approximate** dimensions of 140" long x 48" wide x 13" high. Note- the L/F corner of this area will have its width reduced as a result of the depth of compartment #2. It shall have a full length, full height, adjustable divider. This divider shall be mounted with full width stainless steel UNISTRUT™ in the front and rear.

15. BODY (CONTINUED):

15.23 Compartment Details:

- All seams in the compartments shall be sealed with continuous bead silicone base waterproof caulking sealants. Only stainless steel bolts, and nuts shall be used in mounting exterior trim, hardware, or equipment.
- All Compartments shall have two (2) vertically hinged doors except compartments #6, #7, #9, #13, #14 and #15. Compartments #6, #7, #13 and #14 shall have one (1) door each. Compartments #9 and #15 shall not have doors.
- COMPARTMENT #1: Shall have provisions to carry the current in use FDNY stokes basket. This compartment shall have a minimum door clearance of 26" and allow for easy removal and storage of the stokes basket. The rearward door shall have brackets installed to hold two (2) pike poles, and have an aluminum scuff plate installed at the top and bottom. Scuff plate shall be even with the top and bottom of the doors. Provisions shall be provided to store the current in use FDNY "KO Curtain". In addition, there shall be provisions to for a ¼" thick minimum pegboard with approximate dimensions of 88" wide by 18" high, mounted on the rear wall stainless steel Unistrut™ of this compartment. Exact layout, component locations and final installation shall be directed by FDNY and discussed at the Preconstruction Conference.
- COMPARTMENT #2: provide an air bag module to hold seven (7) bags. Bags shall be securely held in place. Module shall be the same size as current "in service" apparatus. Design approved by FDNY. In addition to the above air bag module storage, this compartment shall have the provisions to store nine (9) 45-minute SCBA bottles. Compartment shall be locking with a #1250 key. Bottle storage layout and details shall be directed by FDNY and discussed at the Preconstruction Conference.
- COMPARTMENT #3: (on left side) shall be equipped with a five hundred (500) pound capacity JOHNATHAN™, or equal sliding tray. This compartment shall also be equipped with louvered doors. All components mounted as directed by FDNY.
- COMPARTMENTS #4, #5, #6, AND #7: refer to Section 15.22 for further compartment details.
- COMPARTMENT #8: The rearward door shall have brackets installed to hold two (2) pike poles and shall have full length stainless steel scuff plates. This compartment shall have a minimum door clearance of 26". Scuff plate shall be even with the top and bottom of the doors. Construction and location shall be approved by FDNY.
- COMPARTMENT #9: Walls, floors and ceiling shall be covered with tread plate and have adequate drainage on floor. Two (2) extinguisher-mounting brackets (Fire Hooks™ P/N EXT-H) shall be installed with a single IMMI™, or equal **black** lift style buckle strap. All components mounted as directed by FDNY.

15. BODY (CONTINUED):

15.23 Compartment Details (Continued):

- COMPARTMENT #10: Shall be equipped with louvered doors. It shall also be equipped with a five hundred (500) pound Johnathan™, or equal, sliding equipment tray. This compartment door shall open 110 degrees. This compartment shall also have the following Hurst E-Draulic Tools™ holders, chargers and equipment: One (1) battery charger, 4 slot bank charger, wired 12V “hot”. Hurst™ part # 272080910, one (1) horizontal mounting bracket for S700E cutter, Hurst™ part #HYDPPS700E2, one (1) horizontal mounting bracket for SP555E2 spreader, Hurst™ part #HYDPPSP555E2, and one (1) horizontal, flat, vertical mounting bracket for R421E2 ram, Hurst™ part # HYDPPR421E2. As deemed necessary by FDNY, additional IMMI™ “U10”, or equal, seat belt style straps with lift style buckles shall be provided in this compartment for securing various Hurst tool accessories.
- COMPARTMENT #11: see Section 15.22 for further compartment details / dimensions.
- COMPARTMENT #12: (R/S rear) shall be equipped with a six (6) outlet 110V A/C power strip wired to the apparatus shore power system through a circuit breaker. This outlet strip shall have the ability to operate on either shore power or generator power. Final location shall be approved by FDNY.
- COMPARTMENT #13 AND #14: See Section 15.22 for further compartment details / dimensions.
- COMPARTMENT #15: (open equipment boxed area) Shall be equipped with a red Herculite™, or equal, cover.

15. BODY (CONTINUED):

15.24 Compartment Doors:

- The box pan shall be at least 1-1/2" in depth to fully enclose the door latching assembly and shall have drain hole openings for water drainage and ventilation. Box pan to have a cover over hole for lock mechanism. Box pan welds shall be a minimum of 1-1/2" in length every six (6) inches.
- Each door shall be provided with extruded closed cell automotive type rubber moldings. This molding shall protect the compartment door framing yet provide a weather-resistant seal around the door. In addition, rubber moldings shall be installed along the hinge portion to prevent entry of moisture.
- All doors that are the same dimension shall be of "universal design" and capable of being installed on either side of the apparatus. This shall be discussed at the Preconstruction Conference.
- The compartment doors shall be equipped with full length 14-gauge stainless steel piano hinges, with 1/4" stainless steel pins. All mounting hardware shall be 1/4" minimum zinc coated grade 8 hex head bolts. The slotted hinges shall be bolted to both the body and the door for easy replacement and adjustment. **Welding the hinges is unacceptable.**
- The latching of compartment doors shall be with offset bent handle 6" diameter HANSEN™, or equal, stainless steel latches. Compartment doors shall have d-ring style two-point dead bolt latch systems with #1250 key locks with nylon locknuts. Doors on L/S shall open with counter-clockwise rotation; doors on R/S shall open with clockwise rotation. All door locks fitted with rubber gaskets.
- Dead bolt rods shall line up with holes in compartment frame, without having to bend rods to gain entry into holes.
- Secondary Compartment Locking Provisions: As directed by FDNY, all exterior compartments shall have stainless steel 5" high brackets with vinyl covered halyards and stainless steel snap hooks with grommet, Ronstan International™ "CS2450-10", or equal. Note: Halyards and snap hooks shall lay as flat as possible against the compartment doors/ body when engaged. There shall also be provisions to secure the halyard assembly when not in use so that it does not damage the door. Method of attachment and all components shall be approved by FDNY.
- Above all exterior compartment doors full- length drip molding shall be incorporated. Moldings shall funnel excess water drainage from upper side of body panels to front and rear of compartment door area.
- Rubber bumpers shall be installed on all compartment doors to prevent doors from hitting each other when opened.

15. BODY (CONTINUED):

15.24 Compartment Doors (Continued):

- All compartment double doors shall be “Leo style” design.
- All compartment doors shall have a ¾” hole with a pop in plug on the edge of the compartment doors for lubricating the latch mechanism.

15.25 Compartment Stays/Openers:

- Each vertically hinged compartment door shall be provided with a Hansen Hardware™, or equal, all metal, double spring door opener and stay arm assembly.
- HANSEN HARDWARE™, or equal, opener shall be bolted to the double channel compartment header support unit and the box pan of the door. These units will hold the door in open position and can be closed with single hand without unlatching or touching mechanism.

15.26 Rear compartment door shall be an Amdor™, or equal, roll-up type to access ground ladders, with a #1250 key cylinder.

15.27 The width of the opening of the portable ladder compartment shall be kept to a minimum to allow for the maximum angle of access steps to the turntable.

15.28 Compartment Shelving:

Exterior shelving shall be provided in exterior compartments as noted:

- COMPARTMENT #1 AND #8: Provide a fixed bolt in shelf in these compartments, as well as two (2) adjustable shelves. The fixed shelf placement shall measure 13” from the top of their respective compartment.
- COMPARTMENTS #4, #5, #11 AND #12: Shall each have two (2) adjustable / removable shelves.
- COMPARTMENT #6 AND #13: Provide one (1) adjustable / removable shelf.
- COMPARTMENTS #7, #10 AND # 14: Each shall have three (3) adjustable / removable shelves.

15. BODY (CONTINUED):

15.28 Compartment Shelving (Continued):

- All adjustable shelving shall be held in place by stainless steel angles. Angles shall run entire depth of the shelf. All hardware shall be stainless steel. Each compartment shall have nine (9) UNISTRUT™ stainless steel tracks, (3) on each of the side walls and three (3) on the back walls, running the specified height of the compartment, from the top to one (1) inch from the bottom, evenly spaced. Shelves shall be fully adjustable; from the top to the bottom of the compartment. Tracks shall be welded to the walls (bolting is not acceptable). These units shall be of heavy-duty quality. All shelf hardware shall be 3/8" minimum.
- Shelving shall be fabricated of 3/16" smooth aluminum sheets, for durability and easy mounting of equipment. Each shelf shall have a bolt on or welded on hat section.
- Each shelf shall have the front edge broken to a double channel edge reinforcement with 2" vertical beam. The rear edge shall have a similar break, but, in the opposite direction, so that shelf may be reversed for a lip free edge.
- The exterior compartment floors, shelving and slide outs shall be fitted with removable plastic "Mateflex™", or equal, **black** grating. This material shall be made from a blend of polyethylene with incorporated stabilizers. The composition will be resistant to heat, cold, ultra-violet radiation, mechanical impacts and chemical actions.
- All compartment design, material and shelving approved by FDNY.

15.29 Sliding Equipment Tray:

- The apparatus shall be equipped with two (2) sliding equipment trays: one (1) shall be located in compartment #10 and one (1) installed in compartment #3 and shall be approved by FDNY.
- The slide trays shall be fabricated of .190" aluminum for equipment mounting. The trays shall be heavily reinforced to prevent flexing or damage. The edges of the trays shall be broken with 3" flange on each side, welded on corners to form a box type tray surface.
- Slide trays shall have a 500 lb. JOHNATHAN™ slide #1760900, or equal, with two (2) 250 lb. slides per tray.
- Trays to have two (2) horizontal locks on front face of tray to lock tray in the "in" position. Locks shall be connected to a single release to allow for the ability to be released with one hand.
- The trays shall slide fully out of the compartment with an automatic prop mechanism to hold tray in the "out" position. Prop shall have the ability to be released with one hand in order to slide tray back in.
- Final design of trays and locking mechanisms shall be approved by FDNY.

15. BODY (CONTINUED):

15.30 Tailboard/Rear Bumper: Tailboard / rear bumper shall be a bolt-on, easily replaceable three-piece design. All electrical components and wiring shall be easily accessible via removable panels. Easy plug-in disconnect points shall be provided if component wiring runs through any portion of the tailboard / bumper. There shall be adequate structure provided in the design of this unit to withstand impact damage. Final design shall be approved by FDNY.

- “Rear Tailwhacker”: To further protect the rear sides of the apparatus from damage, a custom fabricated frame mounted cross brace shall be installed. It shall be bolted to the chassis frame with appropriately graded hardware and shall extend outboard past the body of the apparatus. Cross brace shall be tapered in the front and shall be overlapped by the above mentioned rub rail. Size and final design shall be approved by FDNY and further discussed at the Preconstruction Conference.

15.31 Body Framework:

- All framework and ladder bay interior shall be painted job color before body and compartment units are welded to frame. Generator module, oil tank compartment, rear turntable frames shall be painted **red** with Amershiel Aliphatic™, or equal, polyurethane.
- If necessary all framework shall be drilled to facilitate water drainage, sealing all hole edges.

15.32 Rear Body Compartment Boxes:

There shall be two (2) compartment boxes mounted on top of the rear body. They shall consist of but not limited to the following:

- Approximate dimensions shall be 20 ½” wide x 46 ½” long x 22” high.
- There shall be a 2” lip on three (3) sides and a ½” overlap all around.
- Full length stainless steel “piano” type hinge with stainless steel mounting hardware.
- There shall be four (4) ½” drain holes. One in each corner.
- There shall be two (2) handles one (1) each side on lid.
- One (1) twist type lock located in center of box.
- Two (2) gas struts, one (1) mounted on each side which shall allow the lid to open to 110 degrees.

15. BODY (CONTINUED):

15.32 Rear Body Compartment Boxes (Continued):

- Top shall be fabricated from Alcoa™, or equal, embossed FTQ bright tread sheet 3/16" diamond plate aluminum (ASTM) 3003-H2/24.
- Exact size and location shall be determined at the Preconstruction Conference.

15.33 Provide a custom made tread plate holder to secure the current in use FDNY smoke ejector fans. Bracket shall have a lift style seat belt strap to secure the fan into the bracket. Location and placement shall be directed by FDNY. Further details shall also be discussed at the Preconstruction Conference.

16. 12 VOLT BODY ELECTRICAL:

- 16.1 The complete 12-Volt body wiring system and electrical appliances shall be to modern automotive standards throughout the installation. Extreme care shall be exercised to provide for easy serviceability of the system in future years. All components shall be identified as to function by a permanent label affixed to the body/ chassis at its' mounting location.
- 16.2 The wiring shall be enclosed in protective nylon loom in all areas. All wiring shall be specially secured with wire locks and clipped to body members. All wiring shall be hidden to prevent unauthorized access. Wiring harnesses between cab and body shall be in PMA AG™ cable and conduit system for protection. Wiring clamps shall be rubber lined securely bolted to chassis frame and body.
- 16.3 Where wire passes through sheet metal, large rubber grommets shall be used to protect both wiring and wire looms. All electrical connections shall be with mechanical type fasteners. Where pigtails from lights are connected self-sealing heat-shrink type connectors shall be used.
- 16.4 All 12 Volt wiring to the rear of the body shall be routed down each side of the exterior body compartments in enclosed electrical raceways over the exterior compartment doors - raceways shall be enclosed full length, easily accessible and protected from damage.
- 16.5 12 Volt wiring from the cab to the body shall be connected at a weather tight box designed for this purpose and/or the main terminal panel box - at this point, all wiring shall be split, so that the body may be removed from the chassis at a later date. The main wiring harness shall be run in PMA AG™, or equal, conduit.
- 16.6 There shall be no junctions within the loom. If any junctions are necessary, a junction box shall be used.
- 16.7 All wiring shall be color function, and number coded throughout the installation. The function and numbering system shall correspond with the electrical wiring "as built" schematic furnished with the apparatus.
- 16.8 Extreme care shall be taken in the installation of any wiring to avoid engine manifold and the exhaust system that could expose the wiring to severe overheating during long periods of operation. Proper insulation, heat "socks" and heat deflection panels shall be installed in such areas.
- 16.9 Braided grounding straps between cab and frame, body and frame, and separate grounding on appliances or circuits as required by FDNY.
- 16.10 All lighting required by applicable regulations and standards shall be supplied. All lighting shall be LED type (except as directed by FDNY). As directed by FDNY, lighting shall be recessed into the body surface of the apparatus.

16. 12 VOLT BODY ELECTRICAL (CONTINUED):

16.11 Illustrated Light Bulb Chart / Schematic: The vendor shall supply a complete, 'as built', illustrated light schematic / layout chart in the operator's manual. The information contained shall include, but not be limited to:

- The light's location and function on the apparatus.
- The manufacturer of the lighting device.
- Lighting manufacturer's lighting program code(s)
- The industry trade number and / or manufacturer's part number of the replacement bulb and / or fixture.

In addition, the vendor shall supply two (2) large laminated versions of these same documents at the inspections for use by fleet maintenance personnel to facilitate the completion of the inspection. All charts shall be subject to FDNY approval.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES:

- 17.1 Sealrite™, or equal, junction boxes and conduit shall be used on 120V/240V junctions/installation throughout the apparatus.
- 17.2 Headlights: Four (4) Firetech™, or equal, LED “halo” headlights with daytime running light feature. Headlights shall be mounted in chrome or stainless steel bezels.
- 17.3 Midship and Rearmost Turn Signal and Marker Lights: Four (4) Britax™ model L428.102.L12V, or equal, rubber mounted, **amber/red**, LED directional signal lights shall be mounted on both sides of cab and each side rear of the apparatus. Locations subject to FDNY approval. If the turn signal and marker functions cannot be accomplished using this lamp, then FDNY shall approve any substituted light proposed by the vendor. In addition, there shall be two (2) Britax™ model L427.203.L12V or equal, rubber mounted **amber/red** LED clearance lights mounted on each side rear of the apparatus as directed by FDNY.
- 17.4 Rear Cornering Lights: Two (2) Whelen™ model PEL2C-FDNY, or equal LED lights mounted on each side rear of the apparatus as directed by FDNY. These lights shall illuminate when the turn signals are activated or when the apparatus transmission is placed in reverse. These lights shall be controlled by a switch in the cab. Further details shall be discussed at the Preconstruction Conference.
- 17.5 Step Well Lighting: Four (4) Whelen™ “T0CACCCR”, or equal **clear**, LED rubber mounted lights. One (1) flush mounted in each cab step well. Lights shall activate when master battery switch is “on” and when any cab door is opened.
- 17.6 Portable Flash Lights: Two (2) Bright Star Lighthawk™ model “07912FDNY” (or latest approved FDNY model) - intrinsically safe portable LED flashlights / charger kits with 12-Volt direct wired battery chargers, web carrying straps, waterproof, steel reinforced handles and switch guards. Light color shall be directed and approved by FDNY – “FDNY” engraved in handle - one (1) mounted as directed on officer's side of apparatus. One (1) light and charger shall be shipped loose.
- 17.7 Fast Chargers: Five (5) Survivor Streamlight™ model “90345”, or equal, 12 Volt “fast” chargers shall be provided in cab. All chargers shall be wired constant hot, 12 Volt, to batteries with circuit breaker protection. Locations shall be directed by FDNY.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.8 CAB CEILING LIGHTS:

- Six (6) lights in total. All lights shall be Whelen™ “60CREGCS”, or equal, recessed type, **red/white** LED.
- Each light shall operate with its’ own recessed three-way switch. Switches shall be mounted at each light and be able to deactivate light from coming on when door opens.
- Two (2) lights in the chauffeur and officer area:

One (1) light in the chauffeur’s area and one (1) light in the officer’s area.

NOTE: Lights shall be mounted on the same plane left to right.

- Four (4) lights in the rear of cab as directed by FDNY.
- Light locations shall be approved by FDNY.

17.9 Rear Cornering Lights: Two (2) Whelen #PEL2C-FDNY or equal, LED lights — mounted one each side, rear facing, in the tread plate area between the rear wheels, They shall be activated by a rocker switch in the cab. They shall function as additional cornering lights as well as functioning as an alley light.

17.10 Cab Mounted Work Lights: There shall Whelen™ “WSLC-FDNY”, or equal, “Work Side” **clear** LED lights on each side of the cab and on each side of the body as directed by FDNY. These shall be used to light the area around the sides of the apparatus. These lights shall be powered through the photocell and shall be wired to operate with the ground lights and shall be activated when the parking brake is applied. There shall also be a cab mounted On/Off switch provided. Further details of operation and layout shall be discussed at the Preconstruction Conference.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS:

FDNY uses the following “zones” when referring to light locations:

ZONE “A”—Front of apparatus

ZONE “C”—Rear of apparatus

ZONE “B”—L/S of apparatus

ZONE “D”—R/S of apparatus

***NOTE:**

- A. One forward center mounted unit shall have three (3) LED modules on cab roof – two units shall be 45° (approx.) Angle mounted. Lights shall fit within the parameters of the ladder. All components mounted as directed by FDNY.
- B. Bar lights shall be direct grounded to the apparatus frame with a minimum of #10 AWG wire.
- C. Bar light frame shall not be used for grounding purposes.
- D. All emergency lighting shall be shock mounted with rubber grommets or pads.
- E. All connectors shall be Molex™, or equal, waterproof connectors.
- F. All forward facing **white** lights shall be interlocked to change color with the parking brake applied.
- g. Lights of the same color shall not be placed next to each other to prevent “wash-out”. Lights shall remain fully populated in “blocking” mode.
- h. A metal cover shall be provided to fully protect the back of any light that protrudes into any compartment. Design and layout of cover shall be approved by FDNY.
- I. Flash patterns on all programmable LED lights shall be set as follows, unless otherwise directed by FDNY:
 - Warning lights---“Rapid flash” mode. (Note: Lower zones shall flash slower than the upper zones). Warning lights shall meet applicable minimum NFPA standards and shall incorporate “high intensity/low intensity” technology. Further details shall be discussed at the Preconstruction Conference.
 - Turn signals-----Lower, FMVSS compliant flash pattern, uppers (if applicable), “Sequential” mode.
 - Brake lights----- “Steady” mode.

NOTE: Light synching/flash patterns shall also be further discussed at the Preconstruction Conference and subsequent inspections of the apparatus. Upper warning zones shall flash at 90 flashes per minute and the lower shall flash at 60 flashes per minute.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE A (LOWER) (CONTINUED):

Two (2)	Whelen™ #M6R-FDNY”, or equal, red LED light heads with programmable flash pattern and Whelen™ #M6FC-FDNY, or equal, chrome flanges.
Two (2)	Whelen™ # M62T-FDNY, or equal, amber LED turn signals with programmable arrow with Whelen™ #M6FC-FDNY, or equal chrome flanges - turn signals shall function independently of the hazard warning light circuit. The turn signals should not operate while the battery disconnect switch is in the off position.
Two (2)	Whelen™ “TLIC-FDNY”, or equal white LED lights mounted on the grille as directed by FDNY.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE A (UPPER) (CONTINUED):

One (1)	Whelen “PCH1-FDNY” or equal, brow light with spot and flood functions, controlled by a switch in the cab. The light shall be mounted so as to not interfere with other warning equipment. The light shall be operated by switches in the cab located as directed by FDNY. Light shall only operate when the parking brake is applied. Further details shall be discussed at the Preconstruction Conference.
One (1)	Whelen™ “R4BFDNY-D”, or equal, red/white left side cab roof light bar, mounted on a five (5) degree angle.
One (1)	Whelen™ “R4BFDNY-C”, or equal, red/white center roof light bar, mounted on a five (5) degree angle.
One (1)	Whelen™ “R4BFDNY-P”, or equal, red/white right side cab roof light bar, mounted on a five (5) degree angle.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE B (LOWER) (CONTINUED):

Two (2)	Whelen™ #M6R-FDNY, or equal red LED light heads with programmable flash pattern and Whelen™ #M6FC-FDNY, or equal, chrome flanges.
Two (2)	Whelen™ p/n “TLI2D-FDNY”, or equal, red/white LED, programmable flash pattern, vertically mounted at the front 45-degree corners of the cab, with Whelen™ “TIONC-FC”, or equal chrome flanges, used as warning lights.
Five (5)	Whelen™ p/n “TLIR-FDNY”, or equal, red LED lights mounted as directed by FDNY.
One(1)	SoundOff Signal™, or equal, LED Set up spotlight on the jack mounted as directed by FDNY.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE B (UPPER):

Five (5)	Whelen™ # TLIR-FDNY, or equal red LED light head with programmable flash pattern and Whelen™ # TLIRC-FDNY or equal, chrome flange mounted in the rear corner as directed by FDNY.
Two (2)	Fire Research™ model #SPA570-Q28, or equal, 12 Volt, 28,000 lumen LED spot/flood lights, one-piece lens frame - mounted as directed by FDNY and controlled by a switch in the wheel well.
One (1)	Whelen™ #M6R-FDNY, or equal, red LED light with Whelen™ #M6FC-FDNY or equal chrome flange mounted as directed by FDNY.

17.11 WARNING LIGHTS, ZONE C (UPPER):

As Noted	Three (3) Whelen™ #TLIR-FDNY or equal, red LED light heads and one (1) Whelen #TLIB-FDNY, blue LED light with matching Whelen™, or equal chrome flanges mounted as directed by FDNY.
Two (2)	Whelen™ #M62T-FDNY, or equal, amber LED high mounted turn signals with programmable, fully populated arrow and Whelen™ #M6FC-FDNY, or equal, chrome flanges mounted as directed by FDNY.
One (1)	Firetech™ “FT-CU-HD24-4300K”, or equal LED light mounted as directed by FDNY.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE C (LOWER):

Two (2)	Whelen™ #M62A-FDNY, or equal amber LED light heads with programmable flash pattern, fully populated with Whelen™ #FR6MC-FDNY, or equal, chrome flanges.
Two (2)	Whelen™ #M62BTT-FDNY, or equal red LED brake/tail led light heads, fully populated with Whelen #M6FC-FDNY, or equal, chrome flanges.
Two (2)	Whelen™ #M62T-FDNY, or equal amber LED turn signals with Whelen™ #M6FC-FDNY, or equal chrome flanges.
Two (2)	Whelen™ #M62BUW-FDNY, or equal clear LED back-up light heads with Whelen™ #M6FC-FDNY, or equal chrome flanges.

17.11 WARNING LIGHTS, ZONE D (UPPER):

Five (5)	Whelen™ # TLIR-FDNY, or equal red LED light head with programmable flash pattern and Whelen™ # TLIRC-FDNY or equal, chrome flange mounted in the rear corner as directed by FDNY.
Two (2)	Fire Research™ model #SPA570-Q28, or equal, 12 Volt, 28,000 lumen LED spot/flood lights, one-piece lens frame - mounted as directed by FDNY and controlled by a switch in the wheel well.
One (1)	Whelen™ #M6R-FDNY, or equal, red LED light with Whelen™ #M6FC-FDNY or equal chrome flange mounted as directed by FDNY.
One (1)	SoundOff Signal™, or equal, LED Set up spotlight on the jack mounted as directed by FDNY

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.11 WARNING LIGHTS, ZONE D (LOWER):

Two (2)	Whelen™ #M6R-FDNY, or equal red LED light heads with programmable flash pattern and Whelen™ #M6FC-FDNY, or equal, chrome flanges.
Two (2)	Whelen™ p/n “TLI2D-FDNY”, or equal, red/white LED, programmable flash pattern, vertically mounted at the front 45-degree corners of the cab, with Whelen™ “TIONC-FC”, or equal chrome flanges, used as warning lights.
Five (5)	Whelen™ p/n “TLIR-FDNY”, or equal, red LED lights mounted as directed by FDNY.

17.11 WARNING LIGHTS AND TRAFFIC ADVISOR:

One (1)	One (1) Whelen™ “2250TAB8-FDNY” or equal, LED traffic eight (8) light LED amber advisor with integral red LED brake light. Controller mounted in cab. Length to be determined at the preconstruction meeting. All components shall be mounted as directed by FDNY.
One (1)	Whelen™ p/n “PSR01FCR-FDNY” red LED light to function as a high mount brake light.

17. 12 AND 120 VOLT LIGHTING AND ACCESSORIES (CONTINUED):

17.12 COMPARTMENT LIGHTS:

- ROM™ P/N R03000, or equal, **clear** LED strips. The strips shall be mounted full length around both sides and tops of all the compartments. Lights shall be the latest available version from the manufacturer. This lighting shall be constructed and mounted in such a manner so as to provide full illumination in the compartment. Mounting and location shall be directed and approved by FDNY.
- The compartment lights and wiring shall be protected by a stainless steel enclosure.
- The compartment lights shall be activated by the dedicated dash rocker switch. This switch shall only be energized when the parking brake (maxi-brake) is applied. All component locations shall be approved by FDNY.
- The right hand side and left hand side compartment lights shall be on separate circuits. The circuit breaker and wiring shall be properly sized for all lights on circuit.

17.13 Engine Work Lights: Two (2) Whelen™ “TIONC-FDNY”, or equal LED engine area work lights with built in switches, and protective guards shall be provided and mounted as directed by FDNY.

17.14 Perimeter Ground Lights: Six (6) Whelen™ p/n “5GC-FDNY”, or equal, **clear** rubber mounted LED perimeter lights shall be installed. The lights shall operate as follows:

- Cab and Body Perimeter Lights: When the main / master electrical disconnect switch is “On”, and the photocell is activated and a cab door is opened, all of the perimeter lights shall illuminate.

17.15 Remote Controlled Spotlight: One (1) Whelen™ “Arges2-FDNY”, or equal, LED remote spotlight, with park and home feature, 12 Volt - with appropriate circuit breaker protection – mounted as directed by FDNY. The control for this light shall be accessible by the officer. Final installation of all components shall be directed by FDNY.

17.16 Marker, I.C.C., and Clearance Lights: Provide the proper amount of marker, I.C.C., and clearance lights as per FMVSS standards. Lights shall be controlled by a three-way headlight switch. All marker lights shall be easily replaceable, and recess mounted where possible. All lighting shall be Whelen™, or equal.

17.17 “Spotter” Lights: Two (2) SoundOff Signal™, EWLSB001, or equal **green** LED “spotter” lights, one (1) on each side, controlled by a switch in the cab, and located as directed by FDNY to illuminate the ground area where the jacks will land when deployed.

17.18 Location of all lights and switches shall be approved by FDNY.

18. 8 KW HYDRAULIC GENERATOR:

- 18.1 One (1) Harrison™ 8 kw “HU08.0MAS-16R”, or equal, hydraulic generator. NOTE: The generator manufacturer shall certify to FDNY that all OEM revisions and updates / upgrades are completed in units that are installed in these apparatus prior to delivery to FDNY. Generator shall be capable of performing under all operating conditions.
- 18.2 Installer shall comply with all recommendations, cautions and restrictions in the manufacturer’s installation guide.
- 18.3 Oil reservoir with 3 micron, maximum, oil and air filters.
- Provide easy access for filter servicing.
 - Sight/temperature gauge on reservoir shall be easily visible.
 - Filler/vent cap shall be filtered type, easily accessible.
 - Filter restriction sensor system relief valve.
 - Anti-cavitation valve.
- 18.4 The generator shall be mounted on top of the deck, adequately protected from potential external damage under the aerial ladder.
- Stainless steel fasteners.
 - Easy service accessibility.
 - Generator housing shall be properly grounded to the chassis using a separate adequately sized cable, not through the mounting hardware.
 - Care shall be taken not to restrict or block the air intake or discharge openings.
 - All external hoses protected by tread plate covers.
- 18.5 There shall be a CHELSEA™, or equal, hot shift power-take-off, with overspeed protection, installed on the transmission PTO opening. All PTO components and accessories shall be easily accessible for service and maintenance.
- 18.6 There shall be a 12 Volt cooling fan with high oil temperature and low oil sensors.
- 18.7 Internal Venturi boost to provide positive suction feed to pump.
- 18.8 Install hydraulic pump “soft start valve” as per manufacturer’s requirements.
- 18.9 Install a matching hydraulic pump – capacity as recommended by generator OEM - no 90° fittings on pump inlet or high pressure outlet of pump.
- 18.10 Power-Take-Off control located on the cab console. Location approved by FDNY.

18. 8 KW HYDRAULIC GENERATOR (CONTINUED):

- 18.11 All hoses shall be of the size pressure rating and length recommended by the generator manufacturer.
- All hydraulic hose shall be pressure rated in excess of systems operating pressures high pressure hoses double braided, minimum.
 - Low pressure hose single braided, minimum.
 - All hoses continuous length, no splices or couplings.
 - All hoses shall be abrasion resistant type, covered end to end with a canvas type spray/wear guard, no split plastic conduit.
 - All hydraulic hoses shall also be covered by chafe protection at all contact/friction/rub points or where passing through openings, this covering shall protect spray guard and hose from abrasion.
 - Rubber lined clamps shall be used to properly secure hoses.
 - At all openings hose shall be protected by full grommets or edge-guard.
 - Use of “tie wraps” shall be minimal, where used they shall be wide heavy duty type.
- 18.12 All hoses shall be routed as far away from exhaust components as possible.
- 18.13 Any/all steel tubing shall be plated for long life or stainless steel.
- 18.14 All hose and tube assemblies shall marked for ease of identification.
- 18.15 One (1) GE™, or equal, circuit breaker box shall be located as directed by FDNY containing a GE™, or equal, main breaker (GFI type), and individual GE™, or equal, “THQL-GFCI” (GFI type) circuit breakers.
- 18.16 One (1) FIRE RESEARCH™ “FROG METER”, or equal, LED digital information panel shall be installed next to the breaker box. It shall have the ability to monitor the following items:
- Generator line frequency.
 - Amps (line 1).
 - Amps (line 2).
 - A/C Voltage.
 - Generator hydraulic oil temperature.
 - Generator run hours.
- 18.17 System wiring and generator installation shall conform to all applicable National Fire Protection Association standards-auxiliary systems, NFPA70 and National Electric Code.
- 18.18 CONDUIT: All 120/240 Volt wiring shall be enclosed in SEALTITE™, or equal, flexible moisture resistant reinforced conduit, with proper seal-tight connectors and hardware. All wire runs through this conduit shall be “home runs”.

18. 8 KW HYDRAULIC GENERATOR (CONTINUED):

- 18.19 Labeling of Equipment: All circuit breakers shall be permanently labeled on the circuit breaker box. Labeling of the actual circuit breaker unit is not acceptable. Metal engraved color coded labels shall be provided for all interior and exterior outlets indicating output amperage, Voltage and phase.
- 18.20 Final location of breaker box and information panel shall be approved by FDNY.
- 18.21 FDNY shall approve and direct the material selection, location / placement and final installation of all generator components.

19. CABLE REEL:

19.1 One (1) Hannay™ “ECR 1624-17-18”, or equal, electric rewind cable reel shall be provided, equipped with fully enclosed 30-amp three conductor collector rings.

- The reel shall be located on top deck of compartment #1. Final location shall be approval by FDNY.
- A roller assembly shall be provided to guide the electrical cable on the reel. A round plastic ball type “stop” shall be installed on the reel assembly.
- The reel shall be equipped with 200' of 10/3 type SO **yellow** electrical cable. The plug on the cable shall a 5-20R 20A NEMA Hubbell™ HBL5369C, or equal plug.
- The 12-Volt rewind system of the reel shall be wired directly to the ignition system, with heavy duty stranded copper cable, through a 40-amp circuit breaker. A momentary, waterproof, “foot activated”, rewind button switch shall be located below Compartment #1 (l/s).
- Cable reel installation shall not infringe on scrub area.
- The reel cable shall be wired to a 30 Amp “slow blow”, individual circuit in the circuit breaker box.

20. AERIAL LADDER:

- 20.1 Ladder shall be rated for a 250-pound tip load and shall be designed to provide a 2:1 safety factor based on live and dead loads. A static stability safety factor of 1.5:1 shall be provided based on the rated load. The aerial device and supporting structure shall be third party tested to confirm that the design meets the design parameters and the intent of the latest NFPA standards for aerial devices.
- 20.2 Aerial ladder shall be constructed of steel, hydraulically operated, consist of four (4) sections and reach a minimum height of one hundred feet (100') above ground level, when fully raised and extended. The entire aerial ladder shall be completely bead blasted prior to any painting. If this process is not possible with the aerial ladder manufacturer, then an alternative process shall be used. This shall be discussed at the Preconstruction Conference. It also shall have a **7½ foot** replaceable bolt on tip painted “day glow” **orange**. **Tip shall be equal in strength to the rest of the ladder.** The rotation motor shall be located in front of the aerial ladder and shall be adjustable to remove excess gear lash. There shall be fabricated tool guards with rolled edges installed on the replaceable tip section that are approx. 30” in length and 6” high. These devices shall protect the ladder and related mechanisms from any loose tools or equipment which may contact it causing jamming / damage. Tool guard design shall be directed and approved by FDNY.
- 20.3 Photo luminescent Non-Skid Tape: Wooster Products Inc™ “Night Glow Flex-Tred”, or equal, **extra coarse grit** shall be applied to end of the aerial ladder handrail and as directed by FDNY.
- 20.4 There shall be a pair of fold out steps mounted at the tip of the fly section as directed by FDNY.
- 20.5 Ladder sliding pads shall be designed so that they may be readily removed and replaced.
- 20.6 Ladder slides shall be a “greaseless design” which does not require periodic lubrication.
- The six (6) ladder pivot points shall be connected to the secondary auto lube system (if required) and shall be approved by FDNY. NOTE: vendor shall furnish written certification to FDNY ascertaining if an auto lubrication is required or not with their ladder design.
- 20.7 A test gauge connection shall be located inside pedestal side access area, to check hydraulic pressure at pedestal.
- 20.8 There shall be a rung alignment indicator light with 2" **green** lens.
- 20.9 One (1) leveling indicator mounted at the rear center of the apparatus. Location approved by FDNY.

20. AERIAL LADDER (CONTINUED):

20.11 An engine acceleration control shall be provided at the operator's pedestal by means of a heavy-duty toggle switch. This switch shall not activate until the “Deadman” control is engaged.

- “Deadman” control shall be a floor-mounted switch, LINEMASTER™, model “531-SWN”, or equal, with **orange** LINEMASTER™ “O-SHIELD”, or equal, protective cover to prevent accidental activation. The floor mounted switch shall control the “Deadman” function of hydraulic system.
- Component selection, layout, and installation of all components shall be directed by FDNY.

20.12 All gauges and controls shall be adequately, permanently labeled.

20.13 Mounting for a FDNY six foot (6') hook, an FDNY Halligan tool, FDNY eight (8) lb. axe and a ten foot (10') scissor ladder shall be installed on upper fly section. Location and mounting shall be approved by FDNY.

20.14 Two (2) Unity® “BG-S-P46SC” or equal, deck lights, 6” **clear** LED spotlights – 12V, 30-watt, 123,700 candlepower minimum, mounted on ladder as directed by FDNY.

20.15 Turntable:

- Protective guardrails shall be installed on all sides of turntable deck. The rear guard rail shall be removable. On the rear portion of the turntable deck there shall be a “Mansaver” device.
- There shall be a guardrail behind the turntable, mounted to the body. It shall be removable and held in with tethered quick release pins.
- Stainless steel framed BUSTIN™, type A-3, steel decking shall be installed on operational areas of turntable.
- Turntable positioning alignment markers shall be provided. These shall be illuminated by pilot lights.
- Alignment markers' installation and lighting arrangement subject to FDNY approval.

20. AERIAL LADDER (CONTINUED):

20.16 Pedestal:

- The operator's pedestal shall be located in the rear of the apparatus on the officer's side.
- The operating pedestal shall have three (3) function control levers, as follows (from left to right):
 - One (1) lever for extension / retraction. (The extension function shall be the '**up**' position of the lever, and the retraction position shall be the '**down**' position of the lever).
 - One lever for (1) for rotation. (The clockwise rotation shall be the '**up**' position of the lever, and the counterclockwise rotation shall be the '**down**' position of the lever).
 - One lever (1) for elevation / hoist. (The '**up**' position of the lever shall be used to lower the ladder, and the '**down**' position of the lever shall be used to raise the ladder).
- The pedestal shall also have a protective metal, hinged, over center non-locking cover that covers entire top of pedestal. Cover shall have a stainless-steel piano style hinge with stainless steel hardware, a prop device to hold open and a handle to allow easy opening. Final design shall be approved by FDNY.
- Pedestal shall incorporate service access covers/doors that shall be equipped with South Co.™, or equal, locks: part # E3-15-15 (lock), part # E-3-5-15 (key).

20. AERIAL LADDER (CONTINUED):

20.17 Pedestal Controls and Indicators: The pedestal shall incorporate but not be limited to the following:

- A remote switch for lights on aerial ladder.
- Low Voltage indicator light.
- Turntable aligned light.
- Safe rotation limit exceeded light.
- Ladder overload light.
- Rungs aligned light.
- Emergency override rotation limit switch.
- Emergency hydraulic system switch.
- Hydraulic system pressure gauge.
- Bottom cylinder pressure gauge.
- Fuel level and diesel exhaust level low **amber** indicator lights.
- Throttle switch (in addition to foot/dead-man switch).
- Ladder control levers (3).
- Pedestal control area shall be adequately illuminated.
Design approved by FDNY.
- One (1) inclinometer located on the side of the aerial. Location approved by FDNY.
- “Jack down” indicators for both jacks. **Green** lights shall indicate “Full Jack Down” and **red** lights shall indicate “Short Jack Condition”.

Note: A digital display system for multiplexing, aerial operation/function and diagnosis shall also be acceptable. This shall be discussed further at the Preconstruction Conference.

20. AERIAL LADDER (CONTINUED):

20.18 Hydraulic System:

- The hydraulic system shall be properly sized to allow all functions to perform as specified and provide sufficient cooling and filtration.
- The system shall be protected by an automatic relief valve.
- The shape of the tank shall provide surface area for sufficient cooling of hydraulic oil during continuous service. The details, location and layout of this compartment and / or tank shall then be discussed at the preconstruction meeting and approved by FDNY. Tank and cover design subject to FDNY approval.
- The hydraulic oil tank shall be adequately sized for apparatus requirements and properly baffled to control surge and foaming.
 - **Ball valves** on inlet and outlet, safety wired in the open position.
 - $\frac{3}{4}$ inch **ball type drain valve**, extended pipe through body floor if necessary.
 - Filtered breather, thread on type.
 - Built-in clean out access.
 - Location of tank/reservoir shall be approved by FDNY.
 - The inlet and outlet of the tank shall be on the same side.
- The fill point shall be on the top of the tank. It shall be secured with a cover to prevent tampering. There will be a plaque mounted next to the fill cap labeled “hydraulic fluid only”.
- There shall be three (3) oil level indicator lights provided, mounted on a hydraulic information panel, located at the rear panel near the ground jack controls. The lights shall indicate the tank oil level. A **green** light shall denote “Full”, an **amber** light shall denote “Working Range”, and a **red** light shall denote “Needs Oil”. The panel shall also have a system pressure gauge and a “Service hydraulic filter” warning light.
- **All hydraulic cylinders shall incorporate pilot operated holding valves to keep them in place until hydraulic pressure is applied allowing movement to a different position.**

20. AERIAL LADDER (CONTINUED):

20.18 Hydraulic System (Continued):

- The hydraulic system shall incorporate a filtration system, to include but not limited to:
 - #100 mesh strainer in fill neck.
 - PARKER TM 15P/30P series, or equal, 5-micron high pressure canister type filter on pressure side, removable canister shall have a drain plug and a check-valve on both lines/sides of filter.
 - PARKER TM RF4 series, or equal, return line filter, or equal, 10-micron filter on return side, restriction indicator gauge, steel housing, top access element filter service.
 - Both filters wired to a “service hydraulic filter” warning light.
 - Filters shall be easily serviceable.
 - Mounting locations shall be approved by FDNY.
- All/any hydraulic hose shall be burst rated at four times systems operating pressures.
 - All hoses shall be abrasion resistant type, covered, end to end, with a canvas type spray/wear guard (no split plastic conduit).
 - All hydraulic hoses shall also be covered by chafe protection at all contact/friction/rub points or where passing through openings, to protect spray guard and hose from abrasion.
 - Rubber lined clamps shall be used to properly secure hoses at all openings the hose shall be protected by full grommets or edge guard use of “tie-wraps” shall be minimal, where used they shall be wide heavy duty type.
 - High pressure hoses double braided, minimum.
 - Low pressure hoses single braided, minimum.
 - All hoses continuous, no splices or couplings.
 - All hose fittings and valves shall be rust and corrosion resistant.
- All steel tubing shall be stainless steel for long life.
- All hose and tube assemblies shall be permanently labeled or stamped with hose type, diameter, length, and fitting type/size for ease of identification when replacement is needed. A laminated legend card shall also be provided.

20. AERIAL LADDER (CONTINUED):

20.19 PTO and Hydraulic Pump:

- A variable displacement, load sense, pressure compensated hydraulic pump shall be provided. This pump shall be direct mounted on a ten (10) bolt engine driven power take-off unit which shall provide sufficient power to operate the unit. The PTO shall be engaged by a "hot shift" system while the transmission is in neutral. The PTO switch with **green** indicator light shall be mounted in a readily accessible location to the right of chauffeur. The switch shall be labeled "PTO - ON/OFF". This light shall be activated by a pressure sensitive switch located at the PTO. The PTO shall remain operational if the indicator light fails.
- An interlock system that shall permit the PTO to activate only when the transmission is in neutral with the parking (maxi) brake engaged.
- Hydraulic system shall be adequate to perform all specified operations within prescribed time limits.
- All test and bypass valves shall be provided with protective covers designed to prevent accidental and/or unauthorized operation of those devices.
- All PTO components shall be easily accessible for service and maintenance. It shall be the responsibility of the vendor to mount the PTO and pump in the most accessible port in the transmission to provide easy serviceability. Final location, layout and installation of all components shall be approved by FDNY.

****NOTE:** An installation utilizing **both** PTO ports of the transmission is the preferred method of installation. In the event the PTOs are "piggybacked", the vendor shall present the proposed PTO, pump, driveshaft, and cab floor details (if affected by PTO installation) for review by FDNY. This shall be discussed further at the Preconstruction Conference. Design, layout and installation of all PTO related components shall be approved by FDNY.

****NOTE:** If both PTO ports are utilized, the aerial PTO shall be mounted in the lower port. If a "piggybacked" installation is utilized, the aerial PTO pump shall be installed in the most accessible location.

20. AERIAL LADDER (CONTINUED):

20.20 Emergency 12V Hydraulic Power System:

- A 12 Volt, D/C, electric/hydraulic back-up system shall be installed. The auxiliary system shall provide hydraulic flow if the primary system should fail. The system shall have one (1) heavy duty motor and pump. It shall have the ability to cycle rapidly and shall be designed for continuous use. It shall be capable of returning the aerial to its stored position and then returning the ground jacks to their stored positions under emergency conditions.
- There shall be one (1) 12-Volt emergency hydraulic pump plumbed directly into the existing hydraulic system. Pump shall be rated heavy duty, system powered by truck chassis batteries, direct wired, independent of all other systems.
- Two (2) quick disconnect couplers with covers and chain type tethers shall be provided.
- A three (3) way reversing control valve shall be provided and used to activate the above mentioned couplers.
- There shall be a total of four (4) switches included in the system. They shall be as follows:
 - One (1) master switch located near the PTO control switch.
 - One (1) momentary switch located on the pedestal control panel.
 - Two (2) momentary switches- one (1) located in each ground jack control compartment.
- All of the above switches shall have protective covers to prevent accidental activation.

NOTE: Final operation, design, and component layout of the emergency 12V hydraulic power system shall be approved and directed by FDNY.

20. AERIAL LADDER (CONTINUED):

20.21 External Emergency External Hydraulic Power System: It is the intent of the FDNY to provide a means to operate all hydraulic functions of the apparatus in the event that the main mode of hydraulic operation becomes disabled. The hydraulic system shall have the capability of receiving hydraulic power from an external source as well as distributing hydraulic power to another apparatus. This system shall consist of, but not be limited to:

- Two (2) high pressure quick disconnect couplers with covers and chain type tethers shall be provided in the hydraulic system. One (1) shall be provided on the pressure side, and one (1) on the return side. Equipment selection, location and final installation of all components shall be approved by FDNY.
- Each hydraulic function of the aerial ladder shall have an isolation valve at the cylinder / hydraulic motor that isolates that component from the rest of the system. **NOTE: These valves shall be secured in the open position.** There shall be a high pressure quick connect in between each isolation valve and the cylinder / hydraulic motor. These valves and quick connects shall permit operation of that function, by means of an external hydraulic source while it is isolated from the rest of the hydraulic system. Equipment selection, location and final installation of all components shall be approved by FDNY.
- See Section 21 for hydraulic jumper line sets.

NOTE: Final operation, layout and design of the emergency hydraulic system shall be directed and approved by FDNY. Provide documentation of system layout and procedure with the delivery of the apparatus.

20.22 240 Volt A/C Emergency Electrical Receptacle:

- It shall consist of, but not be limited to the following components:
 - One (1) 240V Hubbell™ female terminated receptacle with a weather tight flip cover. This outlet shall have a dedicated circuit breaker.
- Further details of operation, controls, layout and installation shall be discussed at the Preconstruction Conference.

20. AERIAL LADDER (CONTINUED):

20.23 Ground Jacks:

- Ground jacks shall be "H" type, capable of allowing safe operation of aerial ladder while keeping apparatus stable. Hydraulic system shall have the capability of fully deploying both jacks in nine (9) seconds per side, maximum, or less. Each jack shall have a tread plate cover for protection. Cover shall be the smallest size possible to cover the width of the jack. Final design shall be approved by FDNY.
- Each side shall operate independently. A single control lever to operate both horizontal and vertical operations shall be located- one (1) on each side of rear of apparatus, inside compartments with horizontally hinged doors. The handle shall operate only in the direction in order for it to function
- The latching of doors shall be with offset bent handle 6" diameter Hansen™, or equal, stainless steel latches. The latches shall have "D-Ring" style handles. The hinges shall be stainless steel piano style with stainless steel hardware, mounted to the bottom of the door. The location of these controls shall allow the operator a clear view of the jacks and shall be approved by FDNY.
- High idle shall automatically operate when ground jack control levers are operated.
- An interlock shall be provided that prevents the operation of aerial ladder until both ground jacks are in the down position, stabilizing the apparatus. This interlock shall incorporate an override.
- An interlock shall be provided that prevents operation of the ground jacks until the aerial ladder is in its bedded position. This interlock shall incorporate an override.
- An interlock shall be provided to allow the aerial to be operated only on the side where jacks are fully deployed. This interlock shall incorporate an override.
- Ground jack controls shall be provided with override capability to allow ground jacks to be "short- jacked". Two (2), properly labeled, override switches shall be supplied-- one (1) located in each of the jack control compartments.
- Each jack control compartment shall include an LED "Jack Down" indicator light.

20. AERIAL LADDER (CONTINUED):

20.23 Ground Jacks (Continued):

- Jack pads shall be poly design. Pads shall be mounted one each rearward underside of the body, one (1) per side. Method(s) of storage of pads and location on apparatus shall be subject to FDNY approval.

20.24 Ladder Cradle: The aerial device shall be equipped with a replaceable poly ladder cradle. The main support portion of this cradle shall be bolted to the apparatus frame. The device shall be retained with captured nuts and also have access panels to permit easy service and replacement should this become necessary.

21. EQUIPMENT TO BE FURNISHED WITH EACH APPARATUS PURCHASED:

21.1 Portable Ladder Pipe:

- One (1) portable ladder pipe with three-inch (3") inlet, "Akron" model #1496, or equal, (ship loose). Flow 750gpm at 100psi, horizontal lock, 15° sweep either side of center, 12 position control handle and adjustable mounting clamps.
- Ladder pipe and its below-listed accessories shall be fitted with FDNY threads.
- Each ladder pipe shall be furnished with the following accessories: (shipped loose) -three (3) ladder pipe tips, sizes 1 1/4", 1 1/2", 1 3/4".
- One (1) stream shaper.
- One (1) Siamese, 3" x 3" x 3". Akron model #1262, or equal.
- Siamese shall be equipped with a pressure gauge reading up to three hundred (300) PSI.
- Mount one (1) ladder pipe mounting fixture, Akron model #497, or equal. The same rubber grip material as used on the aerial shall be used to secure the ladder pipe.
- One (1) Hannay™ reel, P/N C20-14-16, or equal. Reel shall be provided with two hundred and thirty feet (230') of 3/8" manila control line with snap swivels permanently installed on each end.
- Ladder Pipe Hose Tray: Install an aluminum hose tray measuring 8" wide x 12" high x 143" long incorporating break(s) where necessary. Final layout and installation shall be approved by FDNY.

21.2 Portable Ladders:

- All portable ladders supplied with rear mount aerial shall be constructed of aluminum.
- Ladders shall be secured on the apparatus in a manner that will permit each ladder to be removed separately.
- Quick-acting ladder holder, to prevent ladders from sliding out, shall be installed.

21. EQUIPMENT TO BE FURNISHED WITH EACH APPARATUS PURCHASED (CONTINUED):

21.3 The following portable ladders shall be supplied with each rear mount aerial apparatus:

- One (1) thirty-five foot (35') two section extension with steel shoes, Alcolite™, “TEL-35-NYC”.
- Two (2) twenty-four foot (24') two-section extension with rubber safety shoes, DUO-SAFETY™ “SERIES 24-900A”.
- One (1) sixteen-foot (16') roof ladder with steel shoes Alcolite™ “TRL-16”, 19-1/16" wide, 3-3/4" thick.
- One (1) twelve-foot (12') roof ladder with steel shoes, Alcolite™ “TRL-12”, 19-1/16" wide, 3-3/4" thick.
- One (1) combination ladder, with bracket locks (no pawls) and safety shoes, Alcolite™ “CJL-14NYC”.
- One (1) twenty-foot (20') truss roof ladder with steel shoes, Alcolite™ “TRL-20” ladder, 19-1/16" wide, 3-3/4" thick.
- Two (2) folding ladders ten (10) feet. One (1) ladder shall be Alcolite™ Model “FL-10” and one (1) shall be Duo-Safety Model “585A”.
- All portable ladders shall be equipped with standard toe plates.

21.4 Four (4) Fire Hooks™ P/N “EXT-H”, or equal, tubes for mounting 2.5-gallon fire extinguishers. Two (2) shall be installed as directed by FDNY and two (2) shall be shipped loose.

21.5 Six (6) axe brackets for FDNY six (6) pound axes - (ship loose) with tulip clip handle holders.

21.6 Two (2) axe brackets for FDNY eight (8) pound axes - (ship loose), with tulip clip handle holders.

21.7 One (1) pike pole carrier for FDNY twenty foot (20') pike pole (installed).

21.8 Two (2) pike pole carriers for FDNY ten foot (10') pike poles (installed).

21.9 Eight (8) pike pole carriers for FDNY. Six foot (6') pike poles (installed).

21. EQUIPMENT TO BE FURNISHED WITH EACH APPARATUS PURCHASED (CONTINUED):

- 21.10 FDNY Elevator Key, Gas and Water Shutoff Holder: Provide and mount a 3" diameter CHARLOTTE™, or equal, PVC tube, capped on one end, plugged on the other to serve as the elevator key holder. Approximate length shall be 76". The plugged end shall have a rust resistant, vinyl covered chain to tether the cap and prevent its loss. Two brackets shall be fabricated and provided on the rear body to mount the NYC gas and water keys (the water key is 84" long x 26" t-handle). Final mounting, layout, design, exact length of tubes, and attaching devices shall be directed by FDNY.
- 21.11 Ten (10) cab door keys and ten (10) compartment door keys shall be provided.
- 21.12 Four (4) Zico™ P/N "SAC-44-E" NFPA compliant folding wheel chocks (shipped loose and delivered to FDNY Bureau of Logistics)
- 21.13 One (1) 50' length of air hose for inflating tires and pressurizing extinguishers - equipped with dual foot air chuck, 1/4 inch NPT Amflo™ #101D, or equal.
- 21.14 Two (2) 50' **yellow** 10-gauge, three (3) wire, extension cords with Hubbell™ HBL5366-C, or equal and HBL5369-C or equal, 20A male and female plugs. Exact termination details shall be discussed at the Preconstruction Conference.
- 21.15 Hydraulic Jumper Hoses: One (1) set--(1 pressure, 1 return) fifty (50') foot hoses with ends that are compatible with the "quick connects" installed on the aerial shall be supplied. Hoses shall have control valves on the pressure side. Valve shall be approximately 24" from the end that connects to the source of hydraulic pressure. These shall be shipped to FDNY's Fleet Services Division. Final design of all components shall be approved by FDNY. Supply one (1) complete set for every five (5) units ordered.
- 21.16 Drinking Water Cooler: One (1) Igloo™ P/N "48153", or equal, five (5) gallon water cooler, **yellow** and **red** in color with P/N "25043", or equal, mounting bracket and strap, shall be mounted as directed by FDNY. Cooler shall be shipped to FDNY Bureau of Logistics. Mounting details and location shall be discussed at the Preconstruction Conference.
- 21.17 Emergency Jump Start Jumper Cable Set: Twenty-five (25) foot "000" gauge jumper cable with plug compatible with receptacle (on both ends). See Section 12 for further description of the emergency jump start system.
- 21.18 One (1) electronic copy as well as one (1) printed copy of the complete "As Built" operator's manual shall be delivered to FDNY's Bureau of Support Services.

21. EQUIPMENT TO BE FURNISHED WITH EACH APPARATUS PURCHASED (CONTINUED):

- 21.20 FDNY Partner™ Saw Brackets and Blade Holders: The vendor shall provide three (3) brackets that shall be capable of securing the current in use FDNY PARTNER™ saw. (The current in use FDNY model is a Husqvarna™ Heavy Duty Fire Rescue Saw Model #K-970 with 14” blade guard, 12” blades and 7/8” arbor) In addition, the vendor shall supply two (2) fabricated saw blade holders. These shall all be shipped loose. Final design and material construction shall be approved by FDNY and discussed at the preconstruction meeting.
- 21.21 FDNY Chain Saw Holder: Provide (1) custom made bracket for use in holding the current in use FDNY chain saw. This shall all be shipped loose. Final design and material construction shall be approved by FDNY and discussed at the preconstruction meeting.
- 21.22 Safety Equipment: Supply the following with each apparatus delivered:
- Five (5) fluorescent **orange** traffic cones.
- 21.23 Pegboard Hardware: Thirty (30) 1/4-20 hex head bolts and twenty (20) 3/8”-20 hex head bolts. They shall be shipped to the Bureau of Support Services.

22. PAINT:

- 22.1 All finishing of this apparatus shall be to fire apparatus standards. Surface imperfections, orange peel, pinholes, dust, grit, bubbles, peeling, chipping, rust bleed through and fading are not acceptable. All sheet metal, including the interior of the apparatus body shall be chemically cleaned and metal etched with acid type cleaner and spray.
- 22.2 A complete finishing system, multi-step surface preparation, corrosion protection and topcoat shall be used. Preparation / application shall be in compliance with all paint system manufacturer's requirements and recommendations. Manufacturer's technical support shall be provided to address any problems noted by FDNY.
- 22.3 The entire apparatus shall be primed. The primer and sealer coats shall be machine and hand sanded to assure a smooth metal surface for finishing. All loose equipment shall be removed from the apparatus, and painted separately.
- 22.4 Dupont™, or equal, high solid polyurethane basecoat / clear coat. Color: #B8241 **red** lower cab and body. Color: #W8430 **white** upper cab. Color chip(s) shall be furnished to FDNY for approval. The paint layout / paint break line shall be the same as the current "in service" FDNY apparatus, subject to FDNY approval. Paint finish quality shall be subject to FDNY approval.
- 22.5 Touch-Up Paint: Two (2) bottles of **red** and two (2) bottles of **white** touch up paint shall be supplied with each vehicle delivered. Touch up paint shall be the same paint brand and color code as originally applied on the vehicle. Each bottle shall have a built-in brush applicator.
- 22.5 The cab shall be painted prior to installation of glass, wiring, and trim. The stainless steel fuel tank shall **not** be painted. No air brake piping or wiring shall be painted. The chassis frame, axles, and other components shall be painted prior to wiring and brake line installation. The cab interior (parts that are not covered with stainless steel panels, or other covering) shall be painted with the same paint used in the exterior compartments. The frame, cross members, and other under-carriage parts shall be painted **Job Red**.
- 22.6 All tread plate shall be installed before painting, then removed. The body shall then be primed and painted, the areas under the aluminum tread plate undercoated, aluminum tread plate underside separately undercoated, or a non-metallic di-electric barrier tape applied. After installation, edges of all aluminum tread plate shall be silicone caulked.
- 22.7 All hinged compartment doors shall be fitted to the apparatus, sanded, primed, and painted separately off the apparatus. All flush mounted lights, drip moldings, and other equipment shall also be fitted on the body prior to painting, then removed for final finishing to assure paint under all equipment. Note: All holes shall be drilled prior to any painting.

22. PAINT (CONTINUED):

- 22.8 Linex™, or equal, coating shall be applied to all interior areas of the exterior compartments. The interior panel of the compartment doors together with the lock access panel shall also be coated as an assembly with Linex™. The lock panel shall be easily removable from the interior of the compartment door after coating. The interior of all compartment doors shall be sealed in all corners and edges. In addition to the areas noted above, there shall be other areas of the apparatus requiring Linex™. All coating areas shall be discussed at the Preconstruction Conference. Color and exact coverage area shall be approved by FDNY. Further details shall be discussed at the Preconstruction Conference.

23. GRAPHICS:

Shall be applied to apparatus to comply with FDNY requirements. All front and rear facing graphics shall be reflective.

Font: year book solid

QTY	SIZE	COLOR	DESCRIPTION
2	12"	Full color@	FDNY official licensed logo (one on each side of front cab door)@
2	3"	White	F.D.N.Y. decal (one each side under crew cab window) (see note #1)
1	3"	White	F.D.N.Y decal (on front of cab) (see note #1)
1	9"	White	Company number (on front bumper centered)
1	Size TBD at precon.	Red	"LADDER CO. NO." (company number TBD) on rear roll-up door, centered
A/R	Size TBD at precon.	Color TBD at precon.	Company number (on cab roof) - numbers shall be as large as possible, highlighted and outlined. The material chosen shall provide a non-slip walking surface.
2	Size TBD at precon.	White	Company number (one each side - crew cab door)
2	Size TBD at precon.	White	Slanted "FDNY " decals (mounted inline with striping – each side of rear compartment)
1	2"	Red	"KEEP BACK 200 FEET" decal On rear roll-up door)
3	1"	White	Property numbers – registry numbers 1. Glove box face 2. Left lower front cab 3. Left lower rear of body

23. GRAPHICS (CONTINUED):

NOTE- EXACT LOCATION OF ALL GRAPHICS SHALL BE DIRECTED AND APPROVED BY FDNY.
 FONT SHALL BE "YEARBOOK" – EXPANDED SPACING. ALL FRONT AND REAR FACING
 GRAPHICS SHALL BE REFLECTIVE.

QTY	SIZE	COLOR	DESCRIPTION
2	9" H X 20"W	Red/white	Rectangular sign to read: "TO REPORT A FIRE DIAL 911"
A/R	2" OR 3"	Red/white reflective	SCOTCHLITE™ alternating tape, applied to rear step and insides of cab and compartment doors, and as directed by FDNY.
A/R	Size TBD at precon.	Red	3M SCOTCHLITE™ diamond grade conspicuity: red tape applied to the rear of the apparatus to the red painted surfaces of the body. NOTE: Tape shall not be applied directly to any tread plate surfaces. The tape shall be applied to fabricated bolt on metal plates that are attached to the body.
2	Size TBD at precon.	Custom	Company logo, designation and number mounted each side of aerial ladder
2	2-1/2"	Gold	680 series striping shall be installed around front cab, and both sides of the apparatus. There shall be a 4" gap between the lower edge of top stripe and upper edge of bottom stripe.
2	2-1/2"	Yellow	980 series striping installed on the rear of the apparatus. There shall be a 4" gap between the lower edge of top stripe and upper edge of bottom stripe.
1	2-1/2"	White	680 series striping shall be installed around front cab and on both sides of apparatus. It shall be centered between the gold stripes maintaining a 3/4" gap.
1	2-1/2"	White	980 series striping installed on the rear of the apparatus. It shall be centered between the gold stripes maintaining a 3/4" gap.

23. **GRAPHICS (CONTINUED):**

QTY	SIZE	COLOR	DESCRIPTION
2	2.35" H x 21" L	Black reflective	"nyc.gov/fdny" Decal. 3M™ "680" series. Font: Helvetica Medium
2	Size TBD at precon.	Red, white and blue reflective@	American flag decals – "waving style"
4	Size TBD at precon.	Red, orange and white	"BUCKLE UP" seat belt decals—at each cab door position.
1	11x8	Red and White Reflective	"FAST PAK" decal (shipped loose).
1	9x9	Blue and White Reflective	"Star of Life" decal (shipped loose).
ALL MATERIALS LISTED ABOVE SHALL BE 3M SCOTCHLITE® AS FOLLOWS: <u>680 Series Material:</u> • WHITE (3M 680-10) • GOLD (3M 680-64) • RED (3M 680-72) <u>980 Series Material:</u> • WHITE (3M 983-10) • YELLOW (3M 983-71) • RED (3M-983-72) NOTE # 1—COLOR WILL BE DICTATED BY WHAT SIDE OF THE PAINT BREAK DECAL WILL GO ON. IF IN RED AREA, DECAL SHALL BE WHITE. IF IN WHITE AREA, DECAL SHALL BE RED			
PLEASE NOTE: <i>All graphic application, location and detail shall be approved by FDNY and completed prior to delivery acceptance.</i> <i>Contact FDNY Graphic Design at 718-571-7625 with questions only on font type, style and size.</i> @ This decal shall be three (3) color silk screened on 3M 680 Engineer Grade Reflective white vinyl. All inks shall be Scotchlite® compatible and non-face. Logo shall have Gerber UV Guard™, or equal, over seal and be pre-masked. NOTE: All graphics shall be created using high resolution and high quality computer generated artwork. The vendor shall provide scalable electronic copies of all logos in addition to printed approval drawings for final approval by FDNY.			

24. TWO-WAY RADIO EQUIPMENT:

SPECIFICATION FOR TWO WAY RADIO COMMUNICATIONS AND ANCILLARY EQUIPMENT TO BE INSTALLED IN NEW YORK CITY FIRE DEPARTMENT 100' REAR MOUNT AERIAL

SUMMARY OF EQUIPMENT TO BE INSTALLED AND/OR PROVIDED

1. One (1) APX8500 All Band Mobile Two Way Radio with Dual E5 Control Head Individual telephony style Handset and Speaker, and remote configuration.
Primary radio with telephonic handset will be located by the Officer/ Chauffer position,
2. One (1) Mobile Data Terminal, with Dead Reckoning GPS Module, a Mobile Two Way Data Modem, a Rear MDC Screen, and Printer.
3. One (1) Electronic siren w/Public Address System and Rumbler
4. Three (3) Portable Radio Battery Chargers & Six (6) OEM Motorola APX8500 Batteries
5. One (1) Commercial carrier Broadband Modem
6. Antenna Box (Quantity is TBD)

I ALL BAND MOBILE TWO WAY RADIOS

The Contractor shall furnish and install One (1) Motorola APX8500 Dual Head All band Radio, Model M37TSS9PW1CN with two (2) speakers {1 Officer side based and 1 Backstep based}

Radio, Control Heads, and Speakers will be mounted at the direction of the Director, FDNY Radio Shop or their designee.

Critical Note: (1) Due to a recent product line change, the APX8500 with a “CN” model designation” may have a different footprint, form factor, and layout compared to previous versions. As such, the installation process may require remote configurations to support the Ethernet connections. Exact feature sets, cabling, and other parts will be determined during the prebuild process and throughout the contract term. (2) These Radios must be ordered through the Motorola Solutions NYC Field Office which is currently Altech Electronics. (3) Technical questions regarding the feature set or any technical matter must be addressed to FDNY Radio Shop and Fleet Services.

	M37TSS9PW1CN	APX8500 ALL BAND MOBILE
	GA00268AA	ADD: RFID TAG APEX
	G444AH	ADD: APX CONTROL HEAD SOFTWARE
	GA01670AA	ADD: APX E5 CONTROL HEAD
	GA09007AA	ADD: OUT OF THE BOX WI-FI PROVISIONING

	G806BL	ENH: ASTRO DIGITAL CAI OP APX
	G51AT	ENH: SMARTZONE OPERATION APX
	G319	ENH: ENABLE RF MODEM APX (STD Option)
	G67EH	ADD: REMOTE MOUNT E5 MP
	QA01749	ADD: SW KEY SUPPLEMENTAL DATA (STD OPTION)
As Directed by FDNY	G892AB	ENH: HAND MIC,GCAI WTR RESISTANT APX
	GA00580	ADD: TDMA OPERATION APX
	G831	ADD: AUXILARY SPKR 15W WATER RESISTANT
	UA00049AA	ADD: RADIO MANAGEMENT LICENSE
	W947	ADD: RS232 INTERFACE PACKET DATA (STD OPTION)
	GA00229	ENH: APX GPS ACTIVATION (STD OPTION)
	G857	ADD: FDNY TONESET
	G361AH	ENH: P25 TRUNKING SOFTWARE APX
	G996AS	ENH: OVER THE AIR PROVISIONING
	G298AS	ENH: ASTRO 25 OTAR W/ MULTIKEY
	GA01620AA	ADD: MULTISYSTEM OTAR
	G851AG	ADD: AES/DES-XL/DES-OFB ENCRYPTION AND ADP
	GA09000AA	ADD: DIGITAL TONE SIGNALING
	GA05100	STD WARRANTY
	H1919	MULTIPLEXER QMA
	GA01513SP01PL	ADD: ALL BAND ANTENNA
	QA03399AA	ADD: ENHANCED DATA
	GA00250AA	ADD: WIFI/GNSS FLEXIBLE CABLE LMR240
	GA09001AA	ADD: WI-FI CAPABILITY
	GA01630	ADD: SMART CONNECT
	GA00631	DVRS MSU Activation
	Q445	ADD: MOBILE PERSONAL ACCOUNTABILITY SW
	GA01515	ADD: J600 ADAPTER CABLE
	QA09113	ADD: BASELINE RELEASE
	QA09772AA	EN: MULTI CODEPLUG PROGRAMMING
	GA09012	ADD: MISSION CRITICAL GEOFENCING
	G387	ADD:MULTICAST VOTING SCAN
	GA01767	ADD: APX MOBILE RADIO AUTHENTICATION
	GA01787	ADD: APX8500 ETHERNET MP FACEPLATE
	H02	ENH: TACTICAL RAIO STW-STUN/KILL
	GA01843	ADD: MOBILE IMPACT DETECTION
	GA09008AA	ADD: GROUP SERVICES

	QA03400	DEL: FCC NARROWBANDING
	QA00583	ADD: BLUETOOTH (STD OPTION)
	G335	ADD: 1/4 WAVE 762-870 mHz ANTENNA FOR VRM
	GA00092	ADD: APXM DUAL CONTROL HEAD E5
	G628	ADD: 17FT REMOTE CABLE (TBD on Build)
	G173	ENH: SMART ZONE OMNI LINK (INCL AS PART OF G361AH)
	H1933A	E5 RM TO E5 DM MP RETROFIT KIT
	APX7MICAD	ASSEMBLED MAP KIT (incl. RKN4166 & HLN6863)
	APXWING	WING BOLTS
As Directed by FDNY	G874ABSP01	Coiled Handset modified by vendor
As Directed by FDNY	FD-12	Clip from Telephone Components.com
As Directed by FDNY	G876	Handset w/ Coil
	PNKTDD259A01	USB Ethernet Hub Cable Assembly (UEHCA) Kit w/ Cabling & mounting equipment
	KT000259A01	USB Ethernet Hub Cable Assembly
	DQSPD38301	NORTHCOMM QMA TO MINI-UHF JUMPER CABLES (RF223 CABLES): 12" IN LENGTH NYFD PROJECT ONLY (same as Northcomm Part # NC-05-MUFQMM-FDNY-12-V1)

A. Display & Frequency Programming

The contractor shall program the Motorola Radio with the latest approved codeplug programming configuration used by FDNY. The FDNY Radio Shop can assist the vendor with the proper information at the time of programming.

B. TWO WAY RADIO (APPLICABLE TO ALL RADIOS UNLESS OTHERWISE NOTED)

1. Radio Frequency, deviation and output power shall be measured and recorded by the installer. The Director, FDNY Radio Shop or their designee may provide a worksheet with devices to be tested and the acceptable values. (All Radios)
2. Time out Timer (Time Out Timer shall be set for one minute.) (All Radios)
3. Power output: The power output of the mobile transmitter shall be 10-50 watts, adjustable.
4. Audio Output: Receiver audio output shall be at least 10 watts. Audio shall be routed to the handset ear piece as well as to all mobile speakers simultaneously, under all conditions.

The contractor shall modify the specified handset to allow for FDNY specific needs, procedure to modify handset will be supplied by FDNY Radio Shop. Handset and modified cable shall be installed for easy replacement no rewire or disassembly shall be required to replace handset and or modified cable.

5. The standard mobile speaker (4 ohm without volume control) shall be mounted in the vehicle cabin.
6. An additional E5 control head and enhanced 15-watt audio speaker without volume control shall be mounted in the rear passenger FF area terminated to Main onboard radio.
7. All speakers and control heads shall be mounted at the direction of the Director, FDNY Radio Repair Shop or their Designee. The standard mobile speaker(s) (4 ohm without volume control) shall be mounted in the vehicle cabin. One shall be mounted in the front of the cab and the other in the backstep (rear) of the cab.
8. Receive audio shall be routed to the individual mobile speaker and where applicable, handset earpiece simultaneously, at all times.
9. The audio output shall be tied into the siren system to give audio broadcast capability through the vehicle siren amplifier/speaker.
10. The Front and Rear shall be provisioned to have independent volume control.
11. At the discretion of the Director, FDNY Radio Shop, the contractor shall test, tune, and align and program the radio(s) with the latest configuration used by FDNY including the latest available firmware to allow use of TSBK decode, encode, and alert in the format presently used by FDNY. The FDNY Radio Shop can assist the vendor with the proper information at time of programming
12. The contractor shall supply all Motorola OEM parts necessary to change the radio from a remote mount to a “under dash” mount (control head directly attached to the radio) and vice versa contingent upon the application. Determination of final configuration shall be determined at time of install under direction of the Director, FDNY Radio Shop or their designee.
13. All radios shall be wired and fused independently as directed by the Director, FDNY Radio Shop or their designee.
14. Contractor shall physically engrave each radio with an FDNY serial number. The engraving shall be consistent with the manufacturer’s guidelines and engraved using professional engraving practices. No “hand held” engraving is allowed. Final location and font size to be approved by the Director, FDNY Radio Repair or their designee. Serial numbers will be provided by the FDNY Radio Shop. Pictorial of present engraving location and design supplied upon request.
15. Provision 550 MHz CAT 6a Ethernet Cable from APX8500 Radios to Cradlepoint Quantity of 1 / One per APX8500 Radio transceiver Cable length is TBD

II. MOBILE DATA TERMINAL ENSEMBLE

A. MOBILE DATA COMPUTER (MDC)

The Mobile Data Computer (MDC) as referenced within these specifications is defined as including, but not limited to: radio equipment, modems, mobile computers, cabling, mounts, power supplies (internal and/or external), software, peripherals, interface devices, etc. needed to make a working system to provide communication over the FDNY Broadband system.

The contractor shall furnish and install:

Panasonic CF338Z-0KBM

Quantity of One (1)

Win11 Pro, Intel Core i7-1270P vPro (up to 4.8GHz), AMT, 12.0" QHD Gloved Multi Touch+Digitizer, 32GB, Intel Iris Xe, 512GB OPAL SSD, Intel Wi-Fi 6E, Bluetooth, 4G MLP31-W, GPS, Dual Pass (Ch1:WWAN/Ch2:GPS), Mic and Infrared 2MP Webcam, 8MP Rear Camera, Fingerprint (AD), Barcode, Standard Batteries (2), TPM 2.0, Flat, CF-SVCPDEP3Y - 3 Year Premier Deployment, FZ-SVC512SSD3Y - 3 Year No Return of Defective Drive, FZ-SVCTPNF3YR - 3 Year Protection Plus Warranty, CF-SVCBIOS1 - Custom BIOS, FZ-SVCFESGEN10 - Mobility Engineering Field Service

CF-VEK-333-LMP

Quantity of One (1)

Premium Keyboard for CF-33.

Emissive Red Backlit (4 levels). Handle/kickstand - display can be opened to any angle. Compatible with Tablet, 33 Laptop Vehicle Dock, and 33 Desktop Dock. Ethernet, SDXC (full-size), HDMI, VGA, USB 2.0, USB 3.0 (2), Serial (USB), Power, Docking Connector, Kensington Lock, Tablet Release with Lock/Unlock, Latch Arm. Forward or Reverse-dockable to Convertible Mode"

CF-SVCPDBRZ

Bronze deployment, all security screws will be included and inserted before delivery.

Build # may vary due to vendor adjustments over time, final build to be approved by Director, FDNY Radio Shop or their designee.

IKEY, Ltd. Or equal –MDC peripherals –PDRC package (remote screen)

IK-PAN-PDRC-FDNY - CUSTOM 12.1-Inch Key Vision High-Bright Touchscreen Display for FDNY IK-PAN-USB-RJ45 - USB over Ethernet with 30-foot cable to include, 30ft serial power on/off cable and all cables and accessories required for proper operation.

35 -50 ft. High quality shielded HDMI &VGA cable to be included as noted under video cables. FDNY Fleet and Radio shall be contacted if different lengths are required.

Critical Note: The prepackaged Ethernet Cable Shall NOT be used. Rather, an Ethernet Cable meeting or exceeding the following specifications shall be used with length TBD
Provision 550 MHz CAT 6a Ethernet Cable from Gamber Johnson Dock to Ikey PDRC Quantity of 1.

CAT 6a Ethernet Cable Specifications

Standards Reference: UL-444 / cETLus, ANSI/TIA 568-2.D, ISO / IEC 11801

550 MHz Solid Copper, POE Capable, Shielded Twisted Pair (STP). Manufacturer certified to 10 Gbps. Color coded ends and labels indicating purpose shall be used at the discretion of the

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Director, FDNY Radio Shop or their designee. **For each vehicle delivered, documentation to be provided to the FDNY demonstrating each individual cable's capacity and tested to 10 Gbps post installation. The use of CCA Cable is not allowed.**

Gamber-Johnson, or equal – MDC peripherals

GJ-33-LVD2 PART#7160-0909-02 – or equal, laptop vehicle dock (dual pass) for the Panasonic CF-33 or equal. USB 2.0 (4), USB 3.0 (2), Serial, Ethernet (2), HDMI, VGA, Docking Connector, Dual RF, Power, Release Lever, Lock (Keyed alike). Features two front USB ports for easy access. To include mounting plate for ease of servicing and hard-wired Lind power adapter for this dock.

Provision 550 MHz CAT 6a Ethernet Cable from Gamber Johnson Dock to Cradlepoint Quantity of 1.

Lind power adapter #14103 or equal

Screen support arm #7110-1214 or equal

Wall mounting bracket with for the Ikey screen #7160-0454 or equal

FDNY swivel MDC mounts for use with dock #7160-0868 or equal

Peripherals: PDRC package available through Panasonic as a bundle

All items supplied with standard warranty.

Video+ speciality Cables & adapters -Peripherals

CSTCABAU 35' HQ HN AUDIO CABLE (or equal, available through Altech Electronics)

CSTCABDB9MF 35' HQ HN DB9MF DATA CABLE (or equal available through Altech Electronics)

CSTCABVID 35' HQ HN VIDEO CABLE (or equal available through Altech Electronics)

CSTCABUSB 35' HQ HN USB CABLE, NO AMP (or equal available through Altech Electronics)

ICUSBAUDIOB USB to stereo out external sound card or equal (available from StarTech.com)

47-400-024 USB over cat 5 extender Balun (or equal available from show me cables)

Motorola MDC peripherals or equal

Altech Electronics GPS COAX w/ SMA Connectors

GPSNMO01 Puulse Electronics GPS Antenna, White NMO Type

B. Additional Peripherals required for MDT

1. VTP-112-SP-FDNY printer Manufactured by Cybertech to include all cables, mount(s), device drivers, cabling, and a test roll of thermal paper are to be supplied for the specified printer.
2. 602-1522-ND Edgeport 2c USB to serial converter 2 port- Digi key
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3. ATRACK NE100 or equivalent stand-alone GPS Dead Reckoning solution
GPS receiver with all cables, options and mounting required for FDNY use. Shall include OEM power, USB and serial cable from manufacture (serial cable is null modem type) VSS Z063 Centrodyne VSS Speed Signal Divider / Quantity of One (1)
- The contractor shall supply custom mounting brackets if required for all devices
 - Custom Bracket or other approved method shall be required to secure cables that do not secure to it associated device via locking screws
 - Custom Bracket may be required for assorted peripheral devices such as Serial and USB extensions and adapter devices.
 - The FDNY reserves the right to inspect and approve such brackets prior to use and throughout the contract period.

C. CRADLEPOINT OR EQUAL BROADBAND MODEM(FIRSTNET READY)

1. R1900 Broadband Modem or equal
2. R1900 MB01-19005GB-GA
3. RX30 Dock MB-RX30-MC
4. RC1250 Captive Modem w/ OEM Bracket
5. MC4005G Modem MB-MC400-5GB
6. Critical Note: All manufacture approved peripherals and cables to extend and share the OBDII port. Provision connectivity from vehicle OEM OBDII port to Cradlepoint device in radio compartment with the intent to provision DR-GPS connectivity and other services using OBD2 port
7. Parsec Pro CUJO Antenna- PRO13CJ8L4W1G25W
Parsec 13:1 White Radome CUJO Antenna w/ 8 Cellular elements, 4 WIFI Elements, and 1 GPS Element) Cable Part # PC2008L4WG20SFRSM Cable length is TBD. **Critical Notes: (1) Model of antenna subject to change to adapt for vehicle model and latest technology TBD during prebuild and throughout contract period. (2) Right angle connectors shall be used for final termination to the Cradlepoint. Exact jumper fabrication and installation will be determined during prebuild**
8. MBA5-19005GB-GA NC Mobile Performance Ess+Adv Plan & R1900 5-yr, Global with support and IBR1700 router with WiFi (5G modem), no AC power supply or antennas, North America
9. FTDI Ltd DS_US232R-100 USB to RS232 cable or equivalent (100 CM or 39.3701 inches)
10. DAT-Int Cable OBDII M/F w/ DB9-DB9 Part # 170758-000 (Cable length is TBD)
11. Smartworx cradlepoint LD31C-S B+B OBDII connection cable
12. Null Modem Mini Connector
13. Provision 550 MHz CAT 6a Ethernet Cable from APX8500 Radios to Cradlepoint
Quantity of 1. / One per APX8500 Radio transceiver Cable length is TBD

CAT 6a Ethernet Cable Specifications

Standards Reference: UL-444 / cETLus, ANSI/TIA 568-2.D, ISO / IEC 11801
550 MHz Solid Copper, POE Capable, Shielded Twisted Pair (STP). Manufacturer certified to 10 Gbps. Color coded ends and labels indicating purpose shall be used at the discretion of the

Director, FDNY Radio Shop or their designee. **For each vehicle delivered, documentation to be provided to the FDNY demonstrating each individual cable's capacity and tested to 10 Gbps post installation. The use of CCA Cable is not allowed.**

D. MDC ASSEMBLY AND MOUNTING

The contractor shall furnish and install CradlePoint, or equal modem with all cables and accessories and basic services required for operation and connectivity.

The device shall be configured for FDNY use operating as intended for multi carrier switch over without user intervention certified for use on FirstNet, or equal, modem shall be wired according to manufactures guidelines, each power connection shall have its own location on the blue sea fuse block additional blue sea devices may be required.

Modem shall be mounted in the radio compartment, final wiring and location to be determined during pre-build and throughout the contractual term(s) by the Director, FDNY Radio Shop or their designee.

Contractor shall physically laser engrave each computer, keyboard, screen, Docking station and printer with a FDNY serial number which shall be provided by Radio shop. The engraving shall be consistent with the manufacturer's guidelines and engraved using professional engraving practices. No "hand held" engraving is allowed. Final location and font size to be approved by the Director, FDNY Radio Shop or their designee. A pictorial of present engraving location and design provided upon request.

The MDC will be programmed by the FDNY for use on the FDNY Broadband Network.

The CF33 laptop, dock, and mobile printer shall be mounted in the apparatus cab to allow accessibility of the MDC by both Chauffer and Officer, and rear PDRC accessible to the crew in the Backstep. Final mounting locations to be determined by the Director, FDNY Radio Shop or their designee. An 800MHz antenna shall be furnished and roof mounted, clear of any obstructions, and/or tread plates. A long stanchion shall be used and the single band antenna whip shall be one piece. There shall be no set screws, mechanically compressed contacts or spring-loaded contacts. The contact point between the NMO roof antenna mount and antenna whip shall be the whip itself. A waiver may be issued if a multiband antenna is used. Final configuration and location will be determined by the Director, FDNY Radio Shop or their designee.

III. SPECIFIC MOBILE DATA COMPUTER (MDC) POWER REQUIREMENTS

- A. Wired to a clean voltage source. Source shall be protected to prevent voltage spikes and noise from affecting the radio and MDC equipment. The Lind power protector (described below) shall be used to provide additional protection to the mobile data terminal and its peripherals.
- B. Must respond to ignition sense or battery switch on/off to allow MDC, RF transmitter & modem to power off cleanly after vehicle ignition or battery switch has been shut off as though user shut down the MDC via Windows GUI.

- C. MDC, RF modem and RF Transmitter shall boot when vehicle ignition or battery switch is turned on without recovery application running on startup. The FDNY MDC client software shall operate properly upon boot up and turn on of the MDC. Proper operation is as defined by FDNY Radio Shop and FDNY Starfire group.
- D. Vehicle VSS, Forward/Reverse indication & Ground terminals are to be provided in the radio compartment for easy connection to the mobile data computer and or associated DR-GPS receiver, Manufacture should be contacted for specific electrical requirements. FDNY Radio Shop is to approve final VSS & Forward/Reverse terminal location. The vendor must make the appropriate connections to the vehicle VSS and reverse signals. **The VSS shall only be present when the vehicle is in motion.**
- E. When ignition sense or “battery switch” voltage is turned on, this voltage is applied to the 12VDC timer relay (timer) sense input and to the ignition sense of the CF-33 Dock. The timer will pass voltage to the Lind power conditioner and the Red Lead. The output of the Lind power conditioner will provide power to the Red Lead input to the MDC. The MDC and peripherals shall now be activated.
- F. When the ignition sense or “battery switch” is removed, the data computer (CF-33) will shut down Windows in a “graceful” fashion (as if shut down through the start menu on a desktop). The timer will continue to pass voltage through the Lind power conditioner to the CF-33 dock. At some time after the “graceful” shut down, the timer will “time out” and remove Red Lead voltage to the laptop dock and associated data terminal peripherals.
- G. FDNY reserves the right to change or reconfigure the turn on and shut down sequences. Final determination of this configuration shall be discussed at time of installation with the Director, FDNY Radio Shop or their designee.
- H. Newmar Mobile Data Power System- or equal
1. Newmar Mobile Data Power System part number MDP-25. The protector shall provide spike protection and noise filtering,
 2. The Newmar Data Power System is to be wired to protect the red & black power leads to the mobile data terminal and second screen. Output shall go to a blue sea Fuse box Labeled Navpac/UPS
- I. Lind 12 VDC timer relays-or equal
1. Lind 12 VDC timer relays (model SDT1230U-023) or approved equivalent are used to power down the CF-33 after the device has performed a graceful
 2. Shutdown via removal of ignition sense voltage. They will also power up and down all Red Leads for all radios.
 3. The timers will be triggered on by ignition sense or voltage provided by a “battery switch”. These timers are effectively relays that will be turned on by this ignition sense. The relays will allow for a higher current to pass through. Upon removal of the ignition sense the timers will continue to pass current and will begin timing. After a preset time the timer relays will open, and will remove voltage from the output.

4. Due to current demand, two (2) will be necessary for each vehicle

IV. ELECTRONIC SIREN AND PUBLIC ADDRESS SYSTEM

- A. The Electronic Siren and Public Address System shall consist of:

Federal Signal Model PF400Q-FDNY w/ palm microphone
RBKIT2-COMPACT-FDNY
ES100C 100w Speaker w/ accessory kit

The control head shall be installed in the vehicle cab and the speaker to be mounted face forward, with an approved, heavy-duty, stainless-steel bracket. Speaker shall be mounted behind the grill or mounted on or internal to the front bumper. Bracket shall be Chrome or painted to match speaker. It shall not be necessary for an RRM to crawl underneath the chassis to remove a defective speaker driver or protective screen bezel. An approved waterproof disconnect shall be used and applied to the speaker wires directly behind the siren speaker. Final mounting location and design shall be determined by the Director, FDNY Radio Repair or their designee.

- B. Siren shall be wired to a discreet 12 volt feed in the Radio compartment and additional Blue Sea fuse box shall be added to allow for proper termination. Final wiring and location of device and all components shall be determined during prebuild of pilot vehicle. Ease of servicing shall be considered for all devices. Final location and method to be approved by the Director, FDNY Radio Shop or their designee.

Speaker wires shall match or exceed Federal Signal's specifications for connection to the speaker/driver terminals using two (2) #250 Amp. Faston, plastic-grip receptacles. Wires shall be connected into the siren control module mounted in the radio compartment, as directed.

All exposed wiring running on the outside of the vehicle, shall be run in protective flexi conduit. All exposed wiring run within the interior of the vehicle shall be run in protective wire loom.

The audio output of the radio shall be connected into the siren control module to give audio broadcast capability through the vehicle siren PA system. This audio output shall be adjusted by the vendor as per the siren manufactures specifications. Audio output to the speaker must be clean of noise/hum and clearly understood as per the discretion of the Director, FDNY Radio Repair Shop or their Designee.

- C. Audio levels in all modes of siren operation shall comply with all applicable NYC Local Laws and Noise Restrictions

Siren tone selection / programming and integration with the Rumbler is determined by FDNY Fleet Services.

Foot Pedal(s) integration is determined by Fleet Services.

V. PORTABLE RADIO BATTERY CHARGER

- A. The Contractor shall furnish and install three (3) Cadex, Model USC 2/25, specially configured for FDNY In-Vehicle Portable Radio Battery Chargers with appropriate insert # 07-711-720-00 to charge Motorola PMNN4504 APX series, or equal, batteries. The batteries shall be secured in the charger as to prevent the batteries from ejecting from the charger without user intervention. The charger shall be capable of mounting horizontally or vertically on a wall or flat surface. Power will be provided from a 12 VDC HOT location on the fuse block in the radio compartment, each charger shall be fused independent from another and from other equipment. Actual mounting locations and final wiring configuration shall be determined by the Director, FDNY Radio Shop or their designee.
- B. Provide Six (6) Motorola APX8000xe Batteries (Motorola Part #PMNN4504A) with engraving format performed at the direction of the Director, FDNY Radio Shop or their designee.

- C. Provide Four (4) Powerwerx Panelpole2 (SKU# PANELPOLE2 / GTIN # 840128906057) devices shall be mounted at the direction of the Director, FDNY Radio Shop or their designee. Various adapters / pigtail connectors will be fabricated at the request of the Director, FDNY Radio Shop or their designee.
- D. Two (2) Kussmaul 091-264-SVR Dual USB Charger (USB-A & USB-C 63w) shall be provided in the backstep of the apparatus. Proposed locations: One (1) located adjacent to the Cradlepoint device. One (1) located in close proximity to the PDRC / Rear Screen. Actual mounting locations and final wiring configuration shall be determined by the Director, FDNY Radio Shop or their designee.

VI. D.C. POWER DISTRIBUTION AND CABLE CONNECTORS

- A. The Contractor shall furnish and install one (1) 4-gauge wire originating at the input of the battery disconnect switch and terminating at a feed post in the Radio Compartment. This feed post shall be labeled "12 VDC HOT." The 4-gauge wire shall be protected by a 50 Amp circuit breaker. Entire length protected from chafing.
- B. The Contractor shall furnish and install one (1) 8-gauge wire, originating at the output of the battery disconnect switch and terminating at a feed post in the radio compartment. This feed post shall be labeled "12 VDC SWITCHED." The 8-gauge wire shall be protected by a 30 Amp circuit breaker. Entire length protected from chafing.
- C. A feed post connected to the vehicle electrical ground shall be furnished and located in the radio compartment below or next to the 12 volt feed posts described above. This ground post shall be wired directly to the chassis (frame) of the vehicle using appropriately sized stranded copper cable. This ground shall be wired so that neither the radios, nor MDC will provide the vehicle ground in case of intermittent or actual failure of the grounding system. The feed post shall be labeled "GROUND." Vehicle chassis to ground shall not exceed 1 Ohm
- D. All feed posts shall have insulating covers to prevent accidental electrical short circuits and shall be installed to allow easy access for service. All feed posts shall be readily accessible by radio repair mechanics. A radio mechanic shall not have to remove equipment or shelving to access these posts. Locations of all feed posts must be designated by FDNY.
- E. Actual connection between the Hot and Switched posts and the radio & MDC equipment shall be done using separate fuse blocks that are mounted in the radio compartment. The fuses shall be of the "ATC" Blade type. Each required component (i.e. radio, MDC, siren, printer, etc.) connection shall have its own fused spot on the block; no multiple connections to one spot are permitted. The fuses should be sized as per the manufacturer's specification. These fuse blocks shall be installed so that they are readily accessible and clearly labeled for ease of service. These fuse blocks shall be sized to have four (4) additional available fused connections on each block after all equipment has been installed. The fuse blocks shall be Blue Sea or equal grade and have protective cover
- F. All terminating connections shall be soldered and mechanically crimped using insulated crimp connectors. Twisting together of wires is not permitted. Heat-shrink tubing may be used to

protect these crimped connections. All individual wires shall be one contiguous run from source to load; no “butt” connections or extensions are to be used.

- G. All radio cables shall be individually run within protective conduit as much as possible. Cables shall not be tie wrapped together within any unexposed area or conduit to allow individual cables to be replaced, should the need arise. Conduit should be sized to allow cables to pass their termination sides and connectors without having to cut or splice cables. Contractor shall factor in any heat generated from POE Ethernet cables. A drag cable shall be included for ease of maintenance at the discretion of the Director, FDNY Radio Shop or their designee
- H. Exposed wiring shall be enclosed in flexible wire loom for protection. Securing of loomed cables outside of a protective conduit shall be done using nylon tie wraps. The use of electrical tape for the securing cables and wiring will not be permitted.
- I. Provision four (4) 550 MHz CAT 6a Ethernet Cable from the MDC CPU housed area to the Radio compartment location tilt cab run about 40ft cable each (termination TBD).
- J. Provision one (1) 550 MHz CAT 6a Ethernet Cable from the “Dog House/ GPS Module Area” to the Radio compartment.
- K. All power cables shall be installed with fuse protection that is readily accessible to FDNY Radio Repair personnel.
- L. All cables, wiring, fuse placements, and cable terminations shall be approved by the Director, FDNY Radio Shop or their designee.

VII. ANTENNA, CABLE, AND MOUNTING

- A. Install (7) Antennas in the following denominations:
 - Three (3) NMO mount whip antennas, (2) All Band Antenna (VHF, UHF, 800Mhz) (1) 800 MHz
 - One (1) NMO GPS antenna for MDC
 - One (1) Bolt down WIFI / GPS for APX8500 Radio
 - Two (2) Bolt down Broadband Dome with antenna cables
- B. The All Band Antenna Part # is Pulse Larsen NMO150/450/758 (Black)
 - Covered Frequencies:
 - VHF Frequency: 150-174 MHz
 - UHF Frequency: 430-520 MHz
 - 7/800 MHz: 750-870 MHz
- C. The 800 whip shall be wide range

Except for the tri-band antenna, the whip antennas shall be one complete piece. There shall be no setscrews used. The contact point between the NMO roof antenna mount and antenna whip shall be the whip itself. No mechanically compressed contacts or spring-loaded contacts are allowed. Antennas shall be mounted on the vehicle roof in a square pattern, separated from each other by maximum allowable distance eighteen inches (18") when possible. The GPS antenna shall be mounted on the vehicle roof, as far as possible from the whip antennas, the edge of the roof, any roof obstruction and in accordance with the manufacturer's recommendation. Final locations to be approved by the Director, FDNY Radio Shop or their designee

- D. Arcadian RDANRA-24/71-SQM fixed right angle stubby antenna for each APX8500 Radio. Installed or shipped loose at the direction of the Director, FDNY Radio Shop or their designee
- E. Motorola AN000163A01 Stubby Low-Loss GPS / WIFI Antenna for APX8500
- F. The whip antennas shall be mounted a minimum of twelve inches (12") from the vehicle edge and a minimum of eighteen inches (18") from any roof mounted obstruction when design permits, Accommodations and final design must be approved by Director, FDNY Radio Shop or their designee
- G. Splicing or joining of antenna cable is unacceptable. All cable shall be continuous from radio component to antenna.
- H. Service loops shall be provided on both ends of the antenna cable for ease of service. Length is TBD. Jumpers shall be fabricated and installed at the direction of the Director, FDNY Radio Shop or their Designee.
- I. Four (4) three-quarter inch (3/4) diameter conduits for antenna cables shall be provided; one for each antenna coax 2 conduits for broadband multi coax sized as needed
- J. LMR240 Cable and any other grades of RF cable shall be used as directed by the Director, FDNY Radio Shop or their designee. This will be determined at the Preconstruction conference and throughout the construction period.
- K. All conduits be terminated, at both ends, with insulated bushings
- L. Sharp bends shall be avoided, Ninety (90) degree elbows or adapters will not be accepted.
- M. At the discretion of the Director, FDNY Radio Shop or their designee all cables, adapters, jumpers, and related appurtenances are subject to inspection, testing, and approval. Only Northcomm Technologies, Amphenol or Pasternack RF Connectors are to be used. This includes but is not limited to: male mini UHF straight or right angle, Female QMA and SMA, RP-SMA where applicable. Any deviations must be approved in writing by the Director, FDNY Radio Shop or their designee.
- N. All Antenna cables shall be labeled on both cable ends with weatherproof material and in a professional manner as directed by the Director, FDNY Radio Shop or their designee.

- O. Manufacturer is responsible for providing cables that are of adequate length to allow for full cab tilt
- P. All antenna cabling shall use heat shrinking where applicable
- Q. Drawings showing details of compartment locations, access openings, conduit runs, and Antenna roof locations shall be submitted for approval prior to fabrication.
Antenna locations shall be unobstructed by metal walkway or any fixture within a radius of nine inches (9").
- R. All metal parts on the roof of the truck must be grounded to provide a good ground plane for the antenna.
- S. It is required that the antenna be tuned properly and that the reflected power be kept at less than 4%, VSWR at less than 1.5: 1

VIII. RADIO COMPARTMENTS

- A. One (1) approved vandalproof and weatherproof compartment for FDNY radio equipment shall be provided and installed. The compartment will house the all-band radio to be furnished and installed under this contract. This compartment will also house the Data Radio/Modem, broadband modem and LIND electronic protectors.
- B. Interior dimension of each compartment shall be such that all equipment is secured adequately and can be readily serviced by FDNY Radio Repair personnel.
- C. Each access door shall be full width and full height of its compartment.
- D. Each door shall be provided with a continuous hinge.
- E. Each door shall be equipped with a keyed locking mechanism.
- F. Three (3) keyed alike radio compartment lock keys per vehicle shall be provided. The key type and manufacturer to be specified by FDNY Radio Repair.
- G. T25 Torx Security 10-24 screws shall be used for any access point identified by the Director, FDNY Radio Shop or their designee.
- H. Slide out trays shall be supplied for each piece of equipment. (If required)
- I. Slide out trays shall be installed horizontally on the steel ball-bearing slides with a lock in/lock out mechanism. (If required)
- J. Slide out trays shall be pulled out and pushed in freely when radios are installed; all wires, cables & loom shall be secured for easy access and proper maintenance. (If required)
- K. A laminated pictorial diagram will be secured within the radio compartment(s) depicting fuse sizes, use, and fuse box layout, and other items identified by the Director, FDNY radio Shop or their designee. Final illustration and location to be determined by Director, FDNY Radio Shop or their designee

- L. The Radio Compartments shall be conditioned as to not exceed the housed equipment's rated and operating specifications.
- M. The current apparatus design uses the overhead section of the rear section of the cab above the passenger Seating area in the Passenger / Back step area. The overhead compartment shall be considered weatherproof but must still meet all the requirements stated in this specification. Hinged key locking drop down panel w/ holding cable tether may be substituted for slide out shelving for use on the overhead radio Compartment upon approval by the Director, FDNY Radio Shop or their designee. Pictorial of the current design is available upon request.
- N. The overhead Radio compartments (or other radio compartment style if designated) shall have ample LED lighting to illuminate the space for service. LED lighting shall not emit any RF and shall NOT be wired to any Radio equipment fusing. Rather it should be wired to the Guest / Perko switch by the chauffer. On/Off toggle switch shall be provided to control the light.

IX. CONDUITS FOR CONTROL CABLES:

- A. Individual "Sealtite" Flex conduit runs, or FDNY approved equivalent, shall be Provided for each cable located within the radio compartment, as follows:
- B. Power and control cables shall be run through a minimum two inch (2") diameter conduit. The MDC power and control cables shall be run through an independent minimum two inch (2") diameter conduit. Maximum length of control cable conduits shall be fifteen (15) feet. Contractor shall be cognizant of any heat generation due to any Ethernet POE cables used in conduits. Drag line for ease of service and overall design of the conduit shall be at the direction of the Director, FDNY Radio Shop or their designee.

X. CONDUITS FOR ANTENNA CABLES:

- A. Four (4) three-quarter inch (3/4) diameter conduits for antenna cables shall be provided; one for each antenna coax 2 conduits for broadband multi coax sized as needed.
- B. Maximum length of runs shall be fifteen feet (15")
- C. Distance between antenna locations shall be maximum separation possible
- D. Antenna locations shall be unobstructed by metal walkway or any type fixture with a radius of nine inches (9").
- E. All conduits be terminated, at both ends, with insulated bushings
 - Sharp bends shall be avoided.
 - Ninety (90) degree elbows or adapters will not be accepted.
 - All conduits shall be provided with approved drag wire inside.
 - All conduit installations shall be subject to FDNY approval.
 - Drawings showing details of compartment locations, access openings, conduit runs and antenna roof locations shall be submitted for FDNY approval, prior to fabrication.

XI. MISCELLANEOUS INSTALLATION REQUIREMENTS OF COMM EQUIPMENT

- A. All mounting hardware used shall be stainless steel machine screws with elastic stop-nuts. Sheet metal screws shall not be permitted.
- B. Protective and cosmetic conduit/raceway system for all connecting wires and cables between radio and cabinets, consoles, antennas, and all other communications equipment shall be provided, cab mounted equipment shall be installed in such a manner as to be accessible by both the driver and officer. Location to be approved by the Director, FDNY Radio Shop or their designee. The Contractor shall be responsible to ensure all equipment installed in the cab will not interfere with the operation of passenger protection devices such as seat belts and airbags and OEM functions
- C. The radio console shall be in the vehicle cab. Exact location, design and configuration shall be determined during prototype development. The design shall allow both the driver and passenger in the cab to safely access and operate the MDC, two-way radio, PA microphone, and Siren control head. The design shall not restrict access to vehicle features such as temperature and air conditioning controls, cup holders, AM/FM Radio controls, 12v and USB power plug(s), etc. and include venting that will allow for heat dissipation and not allow liquids or debris inside. Design must not interfere with any safety devices or features including, but not limited to Airbags, restraints, or seat movement. Console finish coating(s) shall be resistant to hospital grade cleaning and decontamination solutions. Temperature within the console should mirror the temperature specs for the External Radio cabinet. Custom faceplates or commercially available faceplates along with security screws (Torx T25) may be utilized to secure the control head for the siren, radio(s), and any areas identified by the Director, FDNY Radio Shop or their designee. Service panels shall be provided. The Director, FDNY Radio Shop or their designee shall have final approval on the design, final installation, and layout of equipment. The Contractor shall be responsible for any radio console redesign, reconfiguration or relocation that may be required due to equipment additions, deletions, modifications, or related equipment changes.
- D. All antennas shall be installed on the roof of the vehicle. Provide maximum spacing between antennas. Stainless steel antenna housing boxes shall be required; installation and design shall be directed and approved by the Director, FDNY Radio Shop or their designee or his designee.
- E. Antenna mounts shall be Larsen NMOHF with solid conductor high frequency coax as suggested by the Manufacturer. Cables shall be pre terminated with RF fitting by the manufacturer. If the coax must be run in a high heat area (140deg F) and above, High heat coax (500degF) coax must be used and proper heat shielding must be applied.
- F. All communications equipment shall include minimum of one (1) year parts and labor warranty, unless otherwise specified. The warranty period will begin upon acceptance of the vehicle by FDNY Fleet Services and not based on vendor date codes or delivery dates. Any spare radio equipment provided under the specification shall be dropped shipped to FDNY. All equipment shall be delivered to the FDNY Radio Shop.

XII. GENERAL REQUIREMENTS FOR RADIO, MDC & ASSOCIATED EQUIPMENT

- A. The equipment specifications, configurations, and quantities denoted above represent the current operational needs for this series of vehicles. The FDNY reserves the following rights during the contract period(s):
1. Modify the products, quantities, and configuration of equipment at any time for a variety of reasons, including, but not limited to: Operational concerns, Administrative concerns, Technological concerns, and Product availability. The FDNY also reserves the right to provide FDNY supplied equipment at any time during the contract period(s). In such instances, Change Order(s) will be issued to the Prime Contractor. Prime Contractor and Certified Installer(s) may not initiate any changes to the Communications equipment or configuration without the written consent of the FDNY. **The Director, FDNY Radio Shop or their designee retains the final decision-making authority on all FDNY communications equipment, including, but not limited to: Equipment selection, configuration, installation, and integration into FDNY Network.**
 2. **The equipment denoted in this solicitation represents the products and configuration sought by the FDNY at the time this solicitation was crafted. However, due to product and/or feature changes, enhancements, and discontinued products, the initial equipment, ancillary equipment, and incumbent installation / configuration may no longer be appropriate or incompatible with the FDNY environment. As such, it is the prime Contractor's responsibility to maintain a liaison with the FDNY Radio Shop and Fleet Services to determine any product and/or feature changes, enhancements, and discontinued products. In such event(s) Change Order(s) will be issued to the Prime Contractor. Note: Cable length determinations are the responsibility of the Prime Contractor. The Director, FDNY Radio Shop or their designee may be contacted for any concerns regarding these matters.**
 3. Unless specified in writing, all Radio equipment including, but not limited to: Radios, MDTs, Modems, Chargers, and peripherals must be installed by a professional Radio Shop with Motorola Certified Installer(s) and/or Trade Certified Professional installation staff approved by the Director, FDNY Radio Shop or their Designee. Motorola Certified Installer(s) and/or Trade Certified Professional Installation Staff shall retain their Certification throughout the contractual period. If the original installer is not located in the NYC metropolitan area, a second Motorola Solutions certified installer must be identified and approved by the Director, FDNY Radio Repair Shop or their Designee for after installation support and service that is within the NYC metropolitan area.
 4. FDNY may require the Prime Contractor to have the Certified Installer(s) attend teleconferences and/or in person conferences, meetings, and inspection trips at various locations, including, but not limited to: FDNY Offices, Vehicle Upfitters and manufacturers. If such attendance is deemed necessary by FDNY, all such costs shall be the responsibility of the Prime Contractor. Inspection Trips by the Certified Installer(s) will coincide with the FDNY inspection trips.

5. The FDNY Radio Shop expects the Prime Contractor and any Subcontractor to use and install high quality electrical equipment that does not cause interference, static, or adverse impact on the FDNY Communications equipment. The FDNY reserves the right to test equipment throughout the contractual term(s) and can be contacted for guidance on these matters.
6. The FDNY Radio Shop may request samples of items including, but not limited to wire, cables, adapters, and brackets to ensure the quality of selected products throughout the contract period.
7. The FDNY Radio Shop reserves the right to pilot various devices, cables, and alter configurations for various administrative, operational, and technological needs throughout the contractual period. Vehicles that have pilot configurations will have "as built" documentation and service placard noting the vehicle as a pilot vehicle. Details to be provided during the preconstruction period and throughout the contractual period.
8. The FDNY Radio Shop may require the Prime Contractor to establish an electronically secured collaborative online workspace for various documents and files to be reviewed and shared by the Prime Contractor and the FDNY. The FDNY reserves the right to limit access to this online workspace for administrative and operational concerns.
9. Submit during prebuild conference(s) and at the ad-hoc request of the FDNY, Shop Drawings detailing the Radio equipment to be installed. This includes, but is not limited to wiring schematics, Antenna layout, fuse schedule, Radio compartment layout, consoles, and a wiring conduit plan overlaid on a mechanical drawing demonstrating access panels, cable length, and serviceability. The final approved drawings and schematics shall be "as-built" and provided to FDNY upon delivery of the vehicle(s).
10. Prime Contractor must notify the FDNY Radio Shop and FDNY Fleet Services via email of any inability to obtain equipment and/or parts or any concerns impacting the Communications equipment during the contract period(s). FDNY points of contact will be provided during the prebuild conferences as well as during the contractual period to account for personnel changes.
11. All Motorola based equipment must be purchased through the NYC Field Office, which is currently Altech Electronics, Brooklyn NY. This is to ensure that the specific FDNY feature set(s) are included. Technical inquiries regarding Motorola products may be made to the NYC office, 335 Adams Street, Brooklyn, NY 11201, Attention: FDNY sales team, (201) 388-0565. Motorola Solutions developed the special product part numbers used for their products in this section and may be accessed as a reference. **The Director, FDNY Radio Shop or their designee retains the final decision-making authority on all FDNY communications equipment, including, but not limited to: Equipment selection, configuration, installation, and integration into FDNY Network.**
12. All radio equipment and peripherals must be installed in a professional manner and using manufacturer's guidelines. Unless specified by the FDNY in writing, all wiring should be "Home Runs" defined as a straight path from device to fuse sources, and without any splices or extensions. Each device shall have its own specific professionally labeled location on the associated fuse box, Wires are to be placed in appropriate, serviceable protective looms to prevent damage from various sources that could be expected in the Fire Service, including,

but not limited to extreme heat, moisture, debris, chemical exposure, chafing, and vibration. Wiring looms shall not be bundled individually or in batches with zip ties. The FDNY Radio Shop can be contacted for guidance on these matters.

13. Professional "as-built" documentation of the Radio Communications equipment, including, but not limited to Wiring Diagrams and Antenna Schematics must be provided in format(s) favorable to the FDNY. This may include mountable service schematic(s) for each vehicle delivered. Change Order(s) issued at any time and for any reason, including, but not limited to: Operational concerns, Administrative concerns, and Product availability may impact the accuracy of "as-built" Drawings. As such, it is the Prime Contractor's responsibility to collaborate in timely fashion with the FDNY and Certified Installer(s) to properly document these modifications, present to the FDNY updated documentation reflecting the Change Order(s), provide collaborative testing and inspection, final approval by the FDNY, and ensure a mutually agreeable "cut over" and assimilation of the Change Order(s).
14. Ease of use, safe, proper installation and maintenance of two-way radio equipment is of prime concern for FDNY. Consideration of design shall be given to accessibility of equipment by personnel both for field users as well as Radio Repair mechanics. This shall be further discussed at the Preconstruction Conference as well as during the contract period(s).
15. The Contractor(s) shall be responsible to ensure all equipment installed in the cab and where applicable, module mounted / resource space equipment will not interfere with the operation of protection devices including, but not limited to seat belts, Airbags, and sensors.
16. The Prime Contractor shall work in conjunction with FDNY and the communications equipment vendor to determine the best layout for all cable and equipment installation. The Director, FDNY Radio Repair Shop or their Designee shall have final approval on component material selection, layout and final installation of all radio related equipment.
17. Acceptance of prototype shall not be deemed complete until the electrical load test is completed successfully with all communications equipment installed and operating properly.
18. All equipment and devices are to be factory new and unused. Unless specified in writing by the Director, FDNY Radio Repair Shop or their Designee it is not permitted to use devices that have been decommissioned, repaired / refurbished or that have sustained damage. Nor is it permitted to use devices that have been used as demonstration / sample products or devices not for sale in the USA. All items must carry a USA based Warranty.
19. In order to ensure the correction of any communications equipment related problems that are, or appear to be vehicle related, the Prime Contractor shall work with diligence and good faith with the FDNY, or FDNY's designee, to expeditiously resolve communications equipment or software problems.
20. All communications equipment, including the Siren/PA shall include a minimum one (1) year parts and labor warranty. All non-used items that were supplied by the manufacture from any radio equipment provided under the specification shall be dropped shipped to FDNY Radio Shop. All equipment shall be delivered to the FDNY Radio Shop.

21. If approved by the Director, FDNY Radio Repair Shop or their Designee the vendor shall place any unused items supplied by the manufacture for any radio related equipment into a box labeled "FDNY Radio Repair" and left in the vehicle for the radio shop to recover upon receiving the vehicle. Radio Cabinet Keys and Items whose value exceeds \$100 each, or whose combined value exceeds \$300 shall not be delivered in this manner but delivered in a secure manner.
22. All delivered equipment shall include packing slips that reflect the Model Number(s), Serial Number(s), Purchase Order Numbers, Contract number(s) and the line item of the purchase order for the individual item or product. Any FDNY approved changes to equipment delivered shall include clear information stating the Purchase Order item line number, the equipment that was originally specified and the complete information on the replacement item. It is the contractor's responsibility to make sure that all line items are referenced to FDNY's satisfaction.
23. At Pilot Model Inspection, Full descriptive and illustrated material regarding vehicle operation, diagnosis, service, repair, wiring/circuits, troubleshooting and parts listing/bill of material regarding all systems and components for the complete 'as built'. This shall be used to facilitate and conduct the pilot model inspection of the apparatus. This shall be provided in electronic format and supplied in hardcopy format at the request of FDNY.
24. The vendor shall supply a document that shows the cross reference between the manufacturer's serial number and the FDNY serial number for each engraved product. The record shall show, at minimum: model, manufacturer's serial number, FDNY serial number, FDNY vehicle number assigned and dates of installation.
25. Equipment installation shall be in accordance with manufacturers recommendations, as a minimum requirement, and shall exceed those requirements where specified. All installed equipment including, but not limited to electronic devices, cables, adapters, and antennas shall be tested for including, but not limited to: integrity, circuit continuity, and other values deemed by the FDNY. Reports shall be generated electronically by the instrument device(s) for each individual vehicle as directed by the FDNY Radio Shop. Final installation design of all communications equipment, peripherals, and siren shall be as directed and approved by the Director, FDNY Radio Repair Shop or designee.
26. All cab mounted equipment shall be installed in such a manner as to be accessible by the driver and front passenger. Location to be approved by the FDNY Director of Radio Repair, or designee. The Contractor shall be responsible to ensure all equipment installed in the cab will not interfere with OEM equipment and Safety features.

The Prime Contractor and any subcontractors will work with the FDNY to ensure that any wiring diagrams, radio compartment contents, and Radio Compartment keys are always properly secured and not to be shared with anyone without the written consent of the Director, FDNY Radio Shop or their designee.

XIII. WARRANTY

1. Equipment and Installation

- 1A. All radio and electronic equipment installed and/or furnished under this Contract shall carry the manufacturer's standard guarantee for Government and/or Municipal Agencies. But in no case, shall it be less than one (1) year **after vehicle acceptance**. Warranty shall cover both labor and parts.

Note: Upon award, if any electronic equipment make or model number listed in this specification is no longer available, substitution may be permitted. The awarded vendor shall supply written documentation to the Director of Radio Repair via Fleet Services (Send to Supervisor of Apparatus Design as noted below). The documentation shall include, but not be limited to: a listing of the former and replacing part/model #, the reason for the change, and the cost difference (if any) between both units. Failure to provide detailed information may result in non-acceptance.

Any questions regarding the communication equipment or its installation Requirements should be directed to:

Director, FDNY Radio Shop
FDNY Radio Repair Operations
58-65 52nd Road
Woodside, NY 11377
Telephone Number: 718-505-3003

In addition, a copy of all correspondence shall be sent to:

Supervisor of Apparatus Design Unit
FDNY Fleet Services
48-58 35th Street
Long Island City, NY 11101
Telephone Number: 718-784-6500

25. WARRANTY INFORMATION:

- 25.1 **Bumper-to-Bumper Warranty:** all warranties shall be the responsibility of the prime vendor for a period of five (5) years, bumper-to-bumper, all inclusive, 100 % parts & labor - no exclusions except for belts, tires, wiper blades and brake pads.

Note: If an excluded item noted above fails as a result of a covered component failure, then these excluded items shall also be covered under warranty. Additional warranties shall be as follows:

- 1) **Two-Way Radio Equipment:** One (1) year warranty, 100% parts & labor.
- 2) **Chassis / Frame Warranty:** The chassis / frame & all components thereof shall carry a written lifetime warranty against any / all types of failure with the exclusion of major accident damage.
- 1) **LED lighting:** Lifetime manufacturer's warranty (Parts / Light heads only). Physical replacement of LED lights shall be included in the apparatus manufacturers five (5) year bumper to bumper warranty. After (5) five years, FDNY shall be responsible for physical replacement, and the vendor shall supply the parts at no charge.
- 2) **Hydraulic Hose Fittings and Valves:** Five (5) year warranty against rust and corrosion.

Note: For purposes of the warranty, "vehicle warranty" or "warranty" are defined to include the entire vehicle / apparatus, bumper to bumper, and any component thereof or on, for the time period as noted above. Extended warranties for specified items may be necessary to meet the requirements of this specification. If any warranty period (from the OEM or the component manufacturer) is longer than the time listed in this specification, then the longer warranty time period shall apply.

The prime vendor is responsible for the repair / replacement of any and all items covered under the vehicle warranty. **The apparatus manufacturer shall have an authorized local dealer / representative to facilitate all repairs (See section 26.4 for further details).** It is the responsibility of the prime vendor to ensure all repairs / replacements are completed as required by the contract, to the satisfaction of FDNY fleet services.

25. WARRANTY INFORMATION (CONTINUED):

- 25.2 The apparatus & equipment covered by the warranties are of vital importance to the City of New York / FDNY in providing a heightened level of preparedness & emergency services to the public. All warranty repairs on an out of service apparatus shall be completed within thirty (30) working days of prime vendor notification by FDNY. If the warranty work extends beyond thirty (30) days, then the warranty period shall be extended for thirty (30) days plus any additional time that the apparatus is at the vendor for repair. Any working days shall include Monday through Saturday inclusive. It is the responsibility of the prime vendor to notify FDNY fleet services upon completion of such work. FDNY shall make all determinations as to when a vehicle/apparatus is out of service.**
- 25.3 All manufacturer's warranty documents, extended warranty documents and delayed warranty start forms shall be delivered to FDNY fleet services office prior to or at time of delivery on single apparatus orders – prior to or at time of delivery on multi-unit orders. Failure to comply with this requirement may result in refusal of delivery. **All warranty documents shall be completed by the apparatus manufacturer.**
- 25.4 In order to assure that such warranty work is, at all times during the period of the warranty, completed within the required time period and at no charge to city the vendor agrees to provide adequate inside space, equipment parts, and trained personnel. All work that does not require a return to the OEM manufacturer shall be completed at a facility located within a 50- mile radius of fleet services. Field service shall be available 24 hours a day, 7 days a week, year round. FDNY shall determine which repairs are deemed emergency or critical. Repairs shall be completed at any location or point of breakdown, as directed by FDNY. The OEM service technician/representative must be located and respond from within a 50-mile radius of FDNY fleet services. **Note: it is the intent of the FDNY to have the technician arrive at the point of breakdown or required location within ninety (90) minutes and to have repairs deemed critical/emergency in nature completed in a four (4) hour time frame.** The time frame commences with the vendor's notification by FDNY. **Note: this time frame shall include the vendor's travel time, diagnosis, and actual completion of the repair.** In cases where repairs cannot be completed in a four (4) hour time frame, FDNY shall be immediately notified by the vendor.

25. WARRANTY INFORMATION (CONTINUED):

- 25.5 Service Facility: Prime vendor must maintain adequate indoor, heated facilities and personnel to perform first class warranty work – FDNY apparatus returned for repair shall be kept indoors at all times, except for hydraulic fluid cold weather testing – In the instance of minor warranty repairs the vendor is required to provide service at firehouses or at the FDNY main repair shop, solely at the discretion of FDNY – Vendor shall detail in bid (in spaces provided below) submission full description of service vehicles & personnel available for service work, the number of mechanics trained on the proposed apparatus - All required information shall be submitted before award.

Note- See bidders certificate for “Service Facility Description” form to be filled out by vendor.

- a. The prime vendor shall be responsible for the pick-up & delivery of all apparatus covered under the warranty. - vendor is required to pick-up and deliver units from any FDNY facility, as directed by FDNY - at the discretion of FDNY a centrally located pick-up/delivery area may be designated – if the unit shall be returned to the factory/manufacturer and the distance is over 500 miles the apparatus shall be trailered at the vendor’s expense – adequate insurance coverage, to indemnify the City of New York, shall be maintained by the vendor the entire time the apparatus is in their possession.
- 25.7 In the event of failure on the part of the vendor to repair, replace or put in first class condition any unit or component thereof, covered by the warranty, within the required time frame FDNY may have the work done by others and offset the cost against any money due or that may become due to the vendor. - in the event there is no money due, the vendor agrees to pay the city such cost.
- 25.8 Warranty coverage of apparatus, equipment & their component parts shall begin when the unit is **put in service by FDNY**, not on its’ delivery date by the prime vendor.
- 25.9 The prime vendor shall ensure that all equipment and components thereof are of first quality throughout and comply in all respects to the standards set forth in the bid specifications. The prime vendor further warrants all equipment, and parts thereof, against any defects of workmanship, engineering, construction or materials and guarantees to repair or replace, expeditiously, any article that has become inoperative / defective that has not been satisfactorily proven to have been caused by negligence on the part of the user. The minimum time period of this warranty shall be five (5) years, minimum - if the manufacturer’s warranty is for a longer period that time shall apply - a longer time period may be required on individual components, as noted in the specification

25. WARRANTY INFORMATION (CONTINUED):

- 25.10 Service & parts shall be available within 24 hours - the prime vendor shall agree to maintain a supply of parts and documentation for a period of ten (10) years after award.
- 25.11 The responsibility for the apparatus design, construction and its performance reliability shall rest on the prime vendor.
- 25.12 Where an apparatus or component thereof develops “repeated failures” in service, the prime vendor will be required to make any necessary engineering changes, repairs, alterations or modifications to guarantee reliability of performance.
- 25.13 The term “repeated failures” as used herein is defined to mean that: the same apparatus component, assembly or subassembly develops repeated defects, malfunctions and/or breakdowns rendering the apparatus inoperative or requiring repeated shop corrections, service and/or replacements, in 10% or more of the contract quantity in one (1) year of actual operation.
- 25.14 Minor items, ordinary service adjustments, operational damage due to accidents, misuse, lack of proper maintenance or failure to follow manufacturers’ reasonable service and lubrication recommendations are not included or considered under the scope of “repeated failures”.
- 25.15 Records will be maintained as to “repeated failures” and source, description of difficulty made available for the prime vendor’s periodic examination.
- 25.16 For a fair and equitable treatment of “repeated failures”, the prime vendor when notified of service difficulties will be permitted to make detailed studies, analyze operational conditions and recommend corrections to be made in order to obtain the desired reliability and performance of the apparatus. These studies shall be performed promptly and without unnecessary delay. They shall not unnecessarily impede the return to service of the apparatus used in the studies.
- 25.17 If the prime vendor fails to make the proper changes or corrections, does not render field service after due written notice or delays required changes, alterations, or replacements, the City of New York / FDNY will have such work done and charge all costs involved against any or all monies due the prime vendor. If no money is owed, then FDNY shall be reimbursed for the cost of work done.
- 25.18 These same reliability provisions shall apply to parts supplied by the prime vendor for spare and / or replacement purposes.
- 25.19 The prime vendor shall establish a system for reporting to FDNY, all repair work performed by the prime vendor or their authorized agent(s) on all the apparatus / equipment / components covered under the terms of the warranty.
- 25.20 FDNY shall receive copies of all work orders for work performed under the warranty by the prime vendor or their authorized agents outlining details of all repairs made. **NOTE: These documents shall accompany the apparatus upon its return to FDNY following the completion of warranty repairs.**

25. WARRANTY INFORMATION (CONTINUED):

- 25.21 The prime vendor shall establish a system for reporting to FDNY, all repair work performed by the prime vendor or their authorized agent(s) on all the apparatus / equipment / components covered under the terms of the warranty. The vendor shall provide weekly downtime reports to FDNY, as well as provide other downtime reports as per FDNY request.
- 25.22 The prime vendor is required to update service and parts manuals/books with any modifications resulting from any corrective action.
- 25.23 A holdback of 2% of the contract amount shall be retained for the entire warranty period, to ensure compliance with the warranty provisions – vendor shall be reimbursed at the end of the warranty period if warranty service is satisfactory.

26. ROAD AND BRAKE ACCEPTANCE TESTS:

- 26.1 Prior to acceptance, units shall be road and brake tested carrying the equal weight of a full load and a six (6)-person crew.
- 26.2 FDNY shall determine the number of units required to perform the described tests.
- 26.3 Fuel and weights for test shall be furnished by the prime vendor.
- 26.4 Proper engine and transmission performance shall be displayed. Apparatus shall be accelerated from a standing start and no delay shall occur.
- 26.5 The test shall be considered null and void if the apparatus fails any one of the following tests. In this case, a complete new test set shall be performed.
- 26.6 Each selected unit shall be tested as follows:
- With the engine off and a fully evacuated air system, the engine shall be started and sufficient air build-up shall be attained so that the parking brake can be released within sixty (60) seconds. The engine shall be run at 1400 RPM for this test.
 - With the apparatus not running, parking brake released, air system at 120 psi, the reservoir shall be capable of supplying a minimum of six (6) full brake applications before parking brake applies.
 - The apparatus driveline retarder system shall be tested for proper operation and setup as per FDNY specification:
 - Stages 1 and 2: throttle off
 - Stages 3 and 4: apply progressively with brake application
 - From a standing start, on a level roadway, the apparatus shall attain a true speed of thirty-five (35) mph within twenty-five (25) seconds.
 - From a speed of 15 mph, on a level roadway, the apparatus shall attain a true speed of 35 mph within twenty (20) seconds.

26. ROAD AND BRAKE ACCEPTANCE TESTS (CONTINUED):

26.6 Each Selected Unit Shall Be Tested as Follows (Continued):

- Starting from a marked point, to a distance of eight-tenths (8/10) of a mile, the apparatus shall accelerate to a speed of 40 mph then be brought to a complete stop. The apparatus shall be reaccelerated to 40 mph and brought to a complete stop, reaccelerated to 40 mph for completion of the test. The duration of this test shall not exceed two (2) minutes. This test shall be performed in the following order:

STEP 1: From a marked point, the apparatus shall accelerate to a speed of forty (40) miles per hour.

STEP 2: The service brakes shall then be applied and the apparatus brought to a complete stop.

STEP 3: Apparatus shall be accelerated, again to 40 mph, and then stopped again by applying the brakes.

STEP 4: Apparatus shall be accelerated to 40 mph and proceed, at that speed, to a marked point of eight tenths (8/10) of a mile.

NOTE: This test shall be completed in not more than 2 min.

- The apparatus shall be tested to achieve a minimum top speed of 55 mph and a maximum top speed of 58 mph.
- On marked dry pavement, from a speed of 30 mph, apparatus shall be brought to a complete stop (using service brakes only) in a distance of not more than 50 feet.

26. ROAD AND BRAKE ACCEPTANCE TESTS (CONTINUED):

26.6 Each Selected Unit Shall Be Tested as Follows (Continued):

- Immediately after the above road test has been completed, the following hill-climbing test shall be performed.
- On each of these hill-climbing tests, apparatus shall start from rest, at a distance of approximately 50 feet from the header at the foot of the grade.
- Apparatus shall climb the hill on West 185th Street between Broadway and Wadsworth Avenue, Manhattan, in not more than twenty-five (25) seconds. Grade is approximately nine (9) percent.
- Both service and parking brakes shall separately be capable of securely holding the apparatus (in both directions), with a full load on West 185th Street and West 187th Street between Broadway and Wadsworth Avenue, Manhattan.

26.7 Tilt Table Testing: The apparatus “as built” shall meet or exceed the latest edition of NFPA 1900, Section 7.14.3 (and all related subsections) and SAE J2180. Each apparatus purchased shall be tested to meet the following “tilt table” procedures measuring the static rollover threshold for heavy trucks set forth by the current standards:

- Testing shall be performed by the apparatus manufacturer at their facility and certified by an authorized independent third party firm.
- The apparatus shall be tilted at a minimum of 27 degrees evaluating the level of lateral acceleration required to roll the apparatus over in a steady turning situation. Transient, vibratory, or dynamic rollover situations shall not be simulated by this test. The apparatus shall be loaded to the full GVWR and tested in both directions.
- In addition to receiving a Certificate of Compliance, FDNY also requires a wheel-end loading certification listing the weight on each wheel, with the apparatus on the tilt table.
- All tilt table testing shall exceed NFPA 1900, section 7.14.3 (and all related subsections). The results of the wheel-end loading shall certify the apparatus, at the time of its manufacture, is in compliance, with side-to-side weight distributions. The apparatus when loaded to its estimated in service weight, shall have a side-to-side tire load variation of no more than 5% of the total tire load for that axle.

NOTE: TEST RESULTS FOR EACH APPARATUS SHALL BE SUPPLIED UPON DELIVERY TO FDNY.

27. LADDER DEFLECTION TESTS:

- 27.1 Step #1: A two hundred and fifty (250) pound weight shall be secured to the tip of the fly ladder. Ladder shall be fully elevated, fully extended and rotated ninety (90) degrees, within one (1) minute.
- 27.2 Step #2: A two hundred fifty (250) pound weight shall be attached to the tip. With the ladder fully elevated, it shall be capable of being fully extended and rotated 360 degrees in no more than fifty (50) seconds.
- 27.3 Step #3: A two hundred and fifty (250) pound weight shall be secured to the tip of the fly section, nested ladder shall be elevated, fully, nested ladder shall be rotated, fully (360 degrees), clockwise and counter-clockwise, maximum time permitted for each 360-degree rotation - fifty (50) seconds, minimum time permitted for each 360-degree rotation - forty (40) seconds.
- 27.4 Step #4: Ladder shall be positioned at a sixty (60) degree angle to the ground; ladder shall be extended ninety percent (90%) of its length, out over the rear of the apparatus and at a fifteen (15) degree angle to the apparatus' centerline, a five hundred (500) pound weight shall be suspended from the top rung of the fly ladder, deflection from normal, at the tip of the ladder, shall not exceed twenty inches (20").
- 27.5 Step #5: The ladder shall be fully extended and measured. This measurement shall be a minimum of one hundred feet (100') from the top rung of the fly ladder to the ground.
- 27.6 Step #6: Ladder shall be swung to either side, as directed. Ladder shall be positioned at thirty (30) degrees to the centerline of apparatus. Ladder shall be extended, horizontally, eighty-five (85%) percent of its' length, a two hundred and fifty (250) pound weight shall be attached to the tip of the fly ladder; ladder shall be retracted, fully. During this test, ladder shall not:
- A) Experience any erratic movement
 - B) Develop any sliding section distortion
 - C) Require any major adjustment to its control

27. LADDER DEFLECTION TESTS (CONTINUED):

27.7 STEP #7: Nozzle Reaction Test, Part "A" shall be performed as follows:

- Mount ladder pipe (1 1/2" tip) on top rungs of ladder,
Position ladder at a sixty (60) degree angle to the ground,
Turn ladder at a ninety (90) degree angle to the apparatus' center line, extend ladder to ninety percent (90%) of its full length,
Stretch a maximum of 150' of 3 1/2" hose from the pumper to the ladder pipe, operate pumper at a discharge pressure of 125 P.S.I., for five (5) minutes in each direction, direct stream sideways, both to the left and to the right, ninety (90) degrees to the ladder.
- During, and as a result of, above tests, ladder shall not show any undue deflection, twist or set.

STEP #7: Nozzle Reaction Part "B" shall be performed as follows:

- Mount ladder pipe (1 1/2" tip) on top rungs of ladder,
Position ladder at sixty (60) degree angle to the ground,
Direct ladder ninety (90) degrees to the side of the chassis,
Extend ladder ninety percent (90%) of its' full length,
Stretch a maximum of 150' of 3 1/2" hose from the pumper to the ladder pipe, operate pumper at a discharge pressure of 250 P.S.I., direct stream forward, horizontally, execute sudden shut-down of discharge at the pumper.
- Under this test, ladder shall demonstrate adequate stability to withstand the above-described sudden shut down without any permanent distortion taking place.

27.8 After completion of these tests, ladder shall be capable of normal return to its' "bedded" position.

28. ENGINEERING CONFERENCES / INSPECTIONS:

- 28.1 Engineering inspections shall be performed by representatives of FDNY and the NYC Dept. of Citywide Administrative Services (DCAS). Inspections shall be performed at appropriate stages of production, as selected by FDNY. Within sixty (60) calendar days of contract award, the prime vendor shall deliver an accurate production schedule to FDNY.
- 28.2 This schedule may be modified at the discretion of FDNY.
- 28.3 FDNY / DCAS shall have the option to be present for the “AER” (or other mandatory testing).

SCHEDULE FOR INSPECTIONS AND CONFERENCES

THIS SCHEDULE MAY BE MODIFIED AT THE DISCRETION OF FDNY AND/OR DCAS

PRECONSTRUCTION CONFERENCE:

- A. WHERE: FDNY FLEET SERVICES: 48-58 35TH ST. LIC, NY 11101
- B. WHEN: IMMEDIATELY AFTER AWARD OF CONTRACT
- C. WHO: PRIME VENDOR, QUALIFIED ENGINEERS OF BODY, CHASSIS MANUFACTURER, FDNY AND DCAS PERSONNEL
- D. SUBJECT/AGENDA: ONE (1) DAY DISCUSSION OF CHASSIS, BODY AND ALL ACCESSORIES.

BUILD PROCESS INSPECTIONS:

- A. WHERE: BODY BUILDER'S OR PRIME VENDOR'S FACILITY
- B. WHEN: AT VARIOUS STAGES DURING THE BUILD PROCESS. ACTUAL INSPECTION ITEMS TO BE DETERMINED AT THE PRECONSTRUCTION CONFERENCE AND AS THE BUILD PROCESS PROGRESSES.
- C. WHO: PRIME VENDOR, BODY MANUFACTURER, FDNY & DCAS PERSONNEL.

NOTE: An inspection of both the cab and body skeletons shall be conducted at the OEM's facility.

- **At this time, the radio installation shall be complete and functional checks shall be conducted of the equipment installed.** In addition, full descriptive and illustrated material regarding apparatus operation, diagnosis, service, repair, wiring/circuits, air system, troubleshooting and parts listing/bill of material regarding all systems and components for the complete apparatus 'as built' shall be supplied at the pilot model inspection. This shall be used to facilitate and conduct the pilot model inspection of the apparatus. This shall be provided in electronic format, and also supplied in hardcopy format at the request of FDNY.

The prime vendor shall have the capability of conducting three dimensional remote inspections at FDNY request. This shall be accomplished using Matterport™ Pro 2, or equal, 360-degree 3D color camera system with a valid continuous subscription. The system shall have the capability of a "virtual walkaround" of the apparatus from all angles and views. In addition, any video and audio feed shall be available for future viewing by FDNY and/or DCAS personnel. This system shall be used to supplement in-person inspections. Further details shall be discussed at the Preconstruction Conference.

Note: If it is necessary to re-inspect the apparatus after a failed inspection, the total cost of the trip for FDNY and DCAS personnel shall be paid for by the vendor.

29. DELIVERY SCHEDULE / DELIVERY POINT:

GENERAL PLANS AND DATA.....	DAYS* 60
PILOT MODEL INSPECTION.....	DAYS* 600
PILOT MODEL DELIVERED.....	30 DAYS THEREAFTER
DELIVERY OF THE COMPLETED 2ND UNIT.....	45 DAYS AFTER DELIVERY OF THE PILOT MODEL.
DELIVERY OF SUBSEQUENT UNITS...30 DAYS THEREAFTER. 1 PER WEEK UNTIL COMPLETION OF PURCHASE ORDER.	

*** CALENDAR DAYS OF THE PERFORATED DATE OF THE MULTI-PART CARBON INTERLEAFED PURCHASE ORDER OR, FOR ELECTRONIC SYSTEM-GENERATED PURCHASE ORDERS, THE PRINTED DATE THAT THE ORDER WAS ACCEPTED INTO THE CITY'S FINANCIAL MANAGEMENT SYSTEM (FMS).**

NOTE: IF THE VENDOR IS LATE IN DELIVERING THE APPARATUS, THIS ADDITIONAL TIME SHALL BE ADDED TO THE WARRANTY.

EXAMPLE: IF THE APPARATUS HAS A FIVE (5) YEAR WARRANTY AND IS DELIVERED THIRTY (30) DAYS LATE, THEN THE APPARATUS WARRANTY SHALL NOW BE FIVE (5) YEARS AND THIRTY (30) DAYS IN LENGTH.

NOTE: LIQUIDATED DAMAGES ARE IN EFFECT FOR ALL ITEMS OF THIS BID SCHEDULE:

TWO HUNDRED (\$200.00) DOLLARS PER DAY FOR EACH APPARATUS DELIVERED AFTER THE CONTRACT DELIVERY DUE DATE AS STATED ABOVE.

NOT WITHSTANDING ANY PROVISIONS CONTAINED IN THIS CONTRACT, THE NEW YORK CITY FIRE DEPARTMENT, IN CONJUNCTION WITH, AND THE APPROVAL OF THE CITY OF NEW YORK, DEPARTMENT OF CITYWIDE ADMINISTRATIVE SERVICES, MAY ADJUST THE DELIVERY SCHEDULE BASED ON PILOT INSPECTIONS OR CHANGES/AMPLIFICATIONS IN THE SPECIFICATIONS. THIS PROVISION SHALL ALSO APPLY TO ENGINEERING CHANGES REQUIRED FOR COMPLIANCE WITH APPLICABLE NFPA STANDARDS OR FEDERAL, STATE OR CITY MOTOR VEHICLE SAFETY STANDARDS.

NOTE: FINAL ACCEPTANCE BY FDNY AND/OR DCAS SHALL BE CONTINGENT UPON: 1) ACTUAL DELIVERY TO FDNY, 2) ALL INSPECTION DEFICIENCIES CORRECTED, AND 3) ALL REQUIRED EQUIPMENT PROVIDED BY THE VENDOR AS LISTED IN THIS SPECIFICATION. FINAL ACCEPTANCE WILL NOT BE CONSIDERED FOR INCOMPLETE VEHICLE DELIVERIES/ORDERS.

DELIVERY POINT:

DELIVERY POINT FOR THE APPARATUS (AND ALL RELATED DOCUMENTS) ORDERED UNDER THIS SPECIFICATION IS:

FIRE DEPARTMENT, CITY OF NEW YORK
FLEET SERVICES DIVISION
48-58 35TH STREET
LONG ISLAND CITY, NEW YORK 11101

NOTE: A COPY OF THE FINAL PLANS AND DRAWINGS SHALL BE SENT TO THE NYC DEPARTMENT OF CITYWIDE ADMINISTRATIVE SERVICES (DCAS), BUREAU OF QUALITY ASSURANCE (BQA).

30. REQUIRED DOCUMENTATION TIMELINES:

WITHIN THIRTY (30) DAYS AFTER AWARD OF CONTRACT:

- 1) BEGIN MONTHLY PROGRESS REPORTS THAT DETAIL PROGRESS ON THE PILOT MODEL AND INDICATE PERCENTAGE OF COMPLETION ON EACH OF THE SUCCEEDING UNITS.

AT THE PRECONSTRUCTION CONFERENCE:

- 1) GENERAL SHOP DRAWING SHOWING ALL KEY DIMENSIONS INCLUDING TURNING RADIUS.
- 2) LINE LOADING DIAGRAM WITH BENDING MOMENT AND SHEAR CURVE.
- 3) COMPLETE SCHEMATIC OF BRAKE SYSTEM ARRANGEMENT.
- 4) WRITTEN CERTIFICATION OF ALL APPROVED FUELS.
- 5) COMPUTER GENERATED DIAGRAM OF DRIVE LINE, ENGINE, TRANSMISSION AND ALL RESPECTIVE ANGLES.
- 6) CERTIFIED CHARGING CURVE.
- 7) COMPLETE ELECTRICAL SYSTEM LOAD CALCULATION.
- 8) PROPOSED ELECTRICAL SYSTEM LAYOUT SHOWING ALL CIRCUITS AND BREAKERS.
- 9) DETAILED ENGINEERING DRAWINGS OF THE CAB SHOWING POWER PLANT ARRANGEMENT AND CAB MOUNTING CONFIGURATION.
- 10) A SCHEMATIC OF ALL HYDRAULIC ARRANGEMENTS.
- 11) FULL CONCEPTUAL DRAWINGS OF THE ENGINE ENCLOSURE.
- 12) DETAILED BLUEPRINTS THE AERIAL LADDER AND RELATED MOUNTING.
- 13) FIVE (5) COPIES OF THREE-VIEW DIMENSION DRAWINGS SHOWING THE COMPLETE CHASSIS WITH THE BODY AND EQUIPMENT MOUNTED.
- 14) DESCRIPTIVE LITERATURE FOR CHASSIS, ENGINE, TRANSMISSION, BODY, AND ALL AUXILIARY EQUIPMENT.
- 15) DETAILED MULTI-VIEW DRAWINGS, ENGINEERING DRAWINGS AND/OR PICTURES OF COMPLETE UNIT THAT THE VENDOR IS BIDDING.
- 16) DETAILED WEIGHT DISTRIBUTION CHART/DRAWING.
- 17) DETAILED WELDMENT PRINTS AND DIAGRAMS
- 18) WRITTEN CERTIFICATION FOR FIRE SERVICE USE FOR CHASSIS FRAME, ENGINE, TRANSMISSION, DRIVELINE RETARDER, AXLES, SUSPENSION, AERIAL LADDER, STEERING GEAR, BRAKES, TIRES, AND OTHER ITEMS UPON FDNY REQUEST.
- 19) CERTIFICATION THAT ENGINE COMPLIES WITH ALL APPLICABLE REQUIREMENTS.

AT THE PILOT MODEL INSPECTION:

FULL DESCRIPTIVE AND ILLUSTRATED MATERIAL REGARDING APPARATUS OPERATION, DIAGNOSIS, SERVICE, REPAIR, AIR SYSTEM, WIRING/CIRCUITS, TROUBLESHOOTING AND PARTS LISTING/BILL OF MATERIAL REGARDING ALL SYSTEMS AND COMPONENTS FOR THE COMPLETE APPARATUS 'AS BUILT' IN USB FLASH DRIVE FORMAT.

30. REQUIRED DOCUMENTATION TIMELINES (CONTINUED):

UPON DELIVERY OF EACH APPARATUS:

- 1) WRITTEN CHECK-OFF LIST OF PREVENTIVE MAINTENANCE INSPECTION SIGNED BY THE INSPECTOR.
- 2) CERTIFICATION OF COMPLIANCE FOR THE VEHICLE'S SIDE-TO-SIDE WEIGHT DISTRIBUTIONS
- 3) WHEEL-END LOADING CERTIFICATION LISTING THE WEIGHT ON EACH WHEEL WITH THE APPARATUS ON THE TILT TABLE.
- 4) TILT TABLE TEST RESULTS.
- 5) THIRD PARTY CERTIFICATION FOR THE AERIAL LADDER AS BUILT.
- 6) OEM CERTIFICATION OF ANY MODIFICATIONS DESIGNED TO INCREASE HORSEPOWER.
- 7) PERFORMANCE "SCAAN" AND "AER" OR OTHER APPLICABLE TESTING DOCUMENTATION.
- 8) CODED WIRING DIAGRAMS AND COMPLETE SCHEMATICS FOR COMPLETE APPARATUS, AS BUILT.
- 9) TWO (2) SCREW-IN, THREADED EYES, AND BOLTS TO COVER THE BOLT EYE HOLES FOR THE MANUAL CAB TILT.
- 10) ONE (1) PINT OF RED AND ONE (1) PINT OF WHITE TOUCH UP PAINT. EACH BOTTLE SHALL HAVE A BUILT IN BRUSH APPLICATOR.
- 11) APPARATUS MANUFACTURER'S CERTIFICATE FOR THE BUMPER-TO-BUMPER WARRANTY.
- 12) CERTIFICATE ON EMERGENCY LIGHTS AS PER NFPA 1900 AS THEY PERTAIN TO THIS SPECIFICATION.
- 13) CERTIFICATE ON ELECTRICAL LOAD TEST AS PER NFPA 1900 AS THEY PERTAIN TO SPEC.
- 14) ORIGINAL EQUIPMENT MANUFACTURER CERTIFICATES FOR ANY COMPONENT IN ORDER TO MEET OR EXCEED THE BUMPER-TO-BUMPER WARRANTY REQUIREMENTS.
- 15) CERTIFICATE OF COMPLIANCE WITH APPLICABLE PROVISIONS OF ANSI 92.2, 2001.
- 16) AERIAL LADDER CERTIFICATION AS PER NFPA1900 AND NFPA1914 AS THEY PERTAIN TO THIS SPEC.
- 17) CERTIFICATE OF COMPLIANCE WITH OTHER NFPA REGULATIONS AS THEY PERTAIN TO THIS SPECIFICATION.
- 18) "AS BUILT" LINE SHEETS LISTING ALL MODEL/PART NUMBERS FOR COMPONENTS.
- 19) ORIGINAL OEM APPROVAL FOR ENGINE, TRANSMISSION, DRIVELINE RETARDER, AXLES, AND SUSPENSION.
- 20) MANUFACTURER'S CERTIFICATION THAT ANY MODIFICATIONS TO THE FRAME RAIL DO NOT AFFECT RIGIDITY.
- 21) ALL ACCESSORIES, EQUIPMENT, WARRANTY FORMS, WARRANTY DELAY START FORMS, BOOKS, MANUALS, AND SPARE PARTS.

31. LINE ITEMS:

31.1 Books, Manuals and Diagnostic Equipment

●Electronic Diagnostic Media, Manuals and Books: The vendor shall supply **both** hard copy and electronic parts, service, and diagnostic/troubleshooting information. All books and manuals must be original printings. Photostat or fax copies are not acceptable. Hard copy manuals shall be in three (3) ring binder format for ease of updating. USB flash drive format shall be provided in addition to hardcopy manuals, and both formats shall be provided. If a requested format is not available, then the vendor shall supply an FDNY approved substitute.

●Operators Manual: Shall be separate from service and parts manuals. Provide two (2) with **each apparatus purchased**. Manuals shall include but not be limited to:

- Operational instructions for **all** modes of operation.
- Operational instructions for **all** systems and accessories.
- Safety procedures for **all** modes of operation / accessories.
- Description of **all** controls, switches, levers, gauges.
- Description of **all** indicator lights, warning lights and alarms.
- Description of daily operational checks.
- Complete list of fluid types, levels, and capacities.
- Explanation of “emergency jump start” system.
- Complete diagram and part number list of all bulbs.

●Service Manuals: If a service manual refers to another manual to aid in aforesaid procedures, these manuals shall also be supplied.

- Apparatus service manuals shall cover in complete detail all aspects of service, maintenance, troubleshooting, and overhaul procedures shall be provided with each purchase order. They shall include but not be limited to: frame, chassis, abs brakes and air system, drive train, driveline retarder, radiator and cooling system, P/S system, cab, HVAC system, body, doors, glass, electrical, charging system, wiring, hydraulic systems, ladder systems and related items.
- Engine service manuals shall cover in complete detail all aspects of service, maintenance, troubleshooting, and overhaul of engine and related items.
- Transmission service manuals shall cover in complete detail all aspects of service, maintenance, troubleshooting, and overhaul of transmission and related items.

31. **LINE ITEMS (CONTINUED):**

31.1 Books, Manuals and Diagnostic Equipment (Continued):

● Parts Manuals: Shall provide complete parts information, part numbers, part diagrams with exploded views, and any other information related to obtaining replacement parts, including an interchange between the manufacturer's part numbers and the supplier's part numbers as well as a list of replacement part numbers, and their commercial equal if available, for all filters, belts, hoses and light bulbs used on the apparatus. A parts price list shall also be provided. **Parts manuals shall cover the entire apparatus, including every accessory.**

● Schematics: They shall be **"as built"**, and identify in complete detail, every aspect of the system it is representing.

- Wiring schematics that identifies **every** electrical device, circuit, and all wiring of the **entire** apparatus.
- Air system schematics and fuel system schematics.
- Hydraulic and ladder system schematics.
- Laminated hose legend cards shall be provided detailing hose type, diameter, length, and fitting type/size for ease of identification when replacement is needed.

NOTE: Schematics / diagrams shall be scalable and properly sized to print correctly on the current in use FDNY Fleet Services plotter printer so that they can be readily replicated as needed. Further details shall be discussed at the Preconstruction Conference.

● Illustrated Light Bulb Chart / Schematic: A complete, 'as built', illustrated light schematic / layout chart in the operator's manual. The information contained shall include, but not be limited to:

- The light's location and function on the apparatus.
- The manufacturer of the lighting device.
- The industry trade number and / or manufacturer's part number of the replacement bulb and / or fixture. In addition, the vendor shall supply two (2) large laminated versions of these same documents for use by fleet maintenance personnel. All charts shall be subject to FDNY approval.

31. **LINE ITEMS (CONTINUED):**

31.1 Books, Manuals and Diagnostic Equipment (Continued):

- “Blue Print Style” Electrical Schematics: As built, complete continuous electrical schematics. The schematics shall show all circuits in a continuous manner from the front of the apparatus to the rear, and show the entire apparatus on one sheet. All termination and junction points/connections shall also be shown. Final size, design and layout shall be approved by FDNY.
- Electrical Component Locator: Shall show a pictorial representation of the apparatus along with a descriptive location of all electrical components. Final design shall be approved by FDNY.
- A complete listing of all belts, hoses, filters, bulbs and light heads used on the apparatus shall be provided.
- Schematics, parts lists, and other service / reference literature shall be laminated as directed by FDNY so that they endure repeated use, handling and maintain legibility. New documentation shall be provided for any updates. All updated documents shall be laminated.
- Provide a training video that shall cover the operation of the entire apparatus. Video chapters shall cover individual systems of the apparatus. Video layout and format shall be approved by FDNY.
- Diagnostic Equipment: Supply all appropriate OEM software, interface adapters, and cables for engine, transmission and abs systems diagnosis, troubleshooting and repair. All software shall be the most up to date model/edition at time of apparatus delivery, and include all necessary pin #s and / or activation codes, compatible with Panasonic Tough Book model # FZ40-EZ-0ABM or latest updated model. **Updates and subscriptions shall be supplied for the duration of the apparatus warranty. Software shall be full feature, full capability versions. “Lite” versions of software programs are not acceptable.**

It shall be the vendor’s responsibility to keep FDNY up to date with the latest subscriptions, revision/updates and software programs. In addition, the vendor shall also be responsible for maintaining an updated, on demand database detailing all expiration dates of subscriptions and software programs. Further details shall be discussed at the Preconstruction Conference.

31. LINE ITEMS (CONTINUED):

31.2 Training:

The prime vendor shall develop a plan to provide, comprehensive, hands-on OEM drive train diagnostic and repair, training. Prime vendor shall furnish, FDNY approved, comprehensive training sessions within forty-five (45) days of FDNY request. All training shall be conducted at an FDNY designated facility. FDNY shall have the option to videotape and record all training sessions at the FDNY facility.

The prime vendor shall provide OEM drive train system manuals, part listings, diagnostic methods, typical and complex repairs, and a step-based repair methodology. Prime vendor shall furnish workbooks and training manuals at the commencement of each course.

All course instructors shall have teaching experience and firsthand knowledge of the curriculum. Any instructor who, in the opinion of FDNY is not performing satisfactorily shall be removed from service under the contract within two (2) business days, pursuant to oral notification by FDNY. In such an event, the prime vendor shall supply a replacement instructor who has qualifications to perform the required tasks. The instructor may utilize a short film or video to supplement training. However, the medium shall not be used as a substitute for instructor training and hands-on demonstrations

The following training shall be provided for each apparatus purchased:

- A. Two (2) hours minimum – proficient use of the laptop and related software for operation, trouble-shooting, system diagnostics, adjustments of all electronic systems including the location of all components.
- B. Two (2) hours minimum - operation, trouble-shooting, system diagnostics, adjustments of the charging, power/load management systems.
- C. Two (2) hours, minimum - operation, trouble-shooting, system diagnostics, adjustments of the electro-hydraulic systems.
- D. Two (2) hours, minimum - operation, trouble-shooting, system diagnostics, adjustments of: the electrical and mechanical systems of driveline retarder and ABS.

32. F.D.N.Y. BIDDERS CERTIFICATE

THE DATA CONTAINED HEREIN IS FOR THE PURPOSE OF EVALUATING THE BIDDER'S INTENT TO MEET THE REQUIREMENTS OF THE SPECIFICATION. THE BIDDER CERTIFIES THAT THE PRODUCTS AND ITEMS SPECIFIED HEREIN ARE THE MINIMUM THAT WILL BE SUPPLIED. ACCEPTANCE OF THIS BIDDER CERTIFICATE DOES NOT RELIEVE THE VENDOR OF HIS OBLIGATION TO MEET REQUIREMENTS OF THE SPECIFICATION. ALL INFORMATION SUPPLIED HEREIN SHALL BE FROM CURRENT MANUFACTURER' LITERATURE.

BIDDER SHALL COMPLY WITH ALL MATERIAL REQUIREMENTS OF THE SPECIFICATIONS.

DO NOT LEAVE ANY BLANK SPACES

SERVICE FACILITY DESCRIPTION:

NUMBER OF EMPLOYEES: _____

NUMBER OF ROAD SERVICE EMPLOYEES _____

NUMBER OF ROAD SERVICE VEHICLES: _____

DOLLAR AMOUNT OF RELATED INVENTORY ON HAND: _____

NUMBER OF APPARATUS / VEHICLES THAT CAN BE STORED INSIDE:

LOCATION OF SERVICE FACILITY: _____

NOTE: IN ADDITION TO THE ABOVE MENTIONED INFORMATION, AT THE TIME OF BID SUBMISSION, THE VENDOR MUST HAVE A CURRENTLY OPERATING ROAD SERVICE FACILITY AND PROPERLY TRAINED PERSONNEL.

THE VENDOR SHALL SUPPLY A DETAILED ROAD SERVICE PLAN WITH THEIR BID SUBMISSION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: FACILITY DESCRIPTION AND CAPABILITIES, YEARS IN OPERATION, EMPLOYEE QUALIFICATIONS AND EMPLOYEE EXPERIENCE.

CHASSIS:

MAKE _____ MODEL _____ CAB TYPE _____

GROSS VEHICLE WEIGHT RATING (GVWR) _____

COMPLETED APPARATUS DIMENSIONS (INCHES):

OVERALL HEIGHT _____ OVERALL WIDTH _____

OVERALL LENGTH _____ WHEELBASE _____

CA _____ AC _____ BBC _____ TURNING RADIUS _____

ANGLE OF APPROACH _____ ANGLE OF DEPARTURE _____

GROUND CLEARANCE _____

(THE VENDOR SHALL PROVIDE A TURNING RADIUS CHART SHOWING ALL ASPECTS OF THE TURNING RADIUS WITH THEIR BID SUBMISSION. IN ADDITION, SHOP DRAWINGS SHOWING ALL KEY DIMENSIONS, INCLUDING COMPARTMENT DIMENSIONS SHALL ALSO BE PROVIDED WITH THE VENDOR'S BID).

FRAME:

TYPE OF STEEL _____ MINIMUM YIELD STRENGTH _____

RESISTING BENDING MOMENT _____ INCH -LBS.

TYPE OF REINFORCEMENT _____

COMBINED RESISTING BENDING MOMENT _____ INCH LBS

TERMINATING POINTS OF REINFORCEMENT: FRONT _____ TO _____

(THE VENDOR SHALL PROVIDE A LINE LOADING DIAGRAM WITH BENDING MOMENT AND SHEAR CURVE DATA WITH THEIR BID)

ENGINE:

MAKE _____ MODEL _____ LITERS / CUBIC INCHES _____

GROSS HORSEPOWER _____ @ RPM _____

GROSS TORQUE _____ @ RPM _____

(THE VENDOR SHALL SUPPLY ENGINE INFORMATION WITH THEIR BID SUBMISSION)**TRANSMISSION:**

MAKE _____ MODEL _____ # SPEEDS _____

MAXIMUM HP RATING _____ GROSS TORQUE RATING _____

(THE VENDOR SHALL SUPPLY TRANSMISSION INFORMATION WITH THEIR BID SUBMISSION)**ALTERNATOR: LIST ALL OUTPUT RATINGS AT ENGINE RPM**

MAKE _____ MODEL _____ MAXIMUM AMPS _____ @ RPM _____

RATED OUTPUT TEMPERATURE RANGE _____ °F - _____ °F

_____ AMPS @ 800 RPM _____ AMPS @ 1500 RPM _____ AMPS @ 2500 RPM

(VENDOR SHALL SUPPLY ALTERNATOR INFORMATION AND A CERTIFIED CHARGING CURVE WITH THEIR BID).**ELECTRICAL:**

BATTERY CCA _____ RESERVE CAPACITY _____ MINS

BATTERY MANUFACTURER _____ MODEL _____

FRONT AXLE:

MAKE _____ MODEL _____ OEM RATED CAPACITY _____ LBS

OEM DATA BOOK OPTION # _____

FRONT SUSPENSION:

RATED CAPACITY _____ LBS - TYPE SPRING _____

OEM DATA BOOK OPTION # _____

REAR AXLE(S):

MAKE _____ MODEL _____

OEM RATED CAPACITY _____ LBS.

SINGLE OR DOUBLE REDUCTION _____ RATIO (S) _____

OEM DATA BOOK OPTION # _____

REAR SUSPENSION:

RATED CAPACITY _____ LBS – TYPE SPRING _____

HELPER SPRINGS CAPACITY _____ LBS – TYPE SPRING _____

OEM DATA BOOK OPTION #(S) _____

(THE VENDOR SHALL SUPPLY REAR SUSPENSION INFORMATION WITH THEIR BID SUBMISSION).

TIRES:

MANUFACTURER (FRONT/REAR) _____ SIZE (FRONT/REAR) _____

TREAD TYPE: _____ FRONT _____ REAR _____

LOAD RANGE/PLY RATING (FRONT/REAR) _____ RIM OFFSET (F/R) _____

RIM MODEL/PART NUMBER: FRONT _____ REAR _____

MAXIMUM LOAD FRONT _____ LBS. AT _____ PSI

MAXIMUM LOAD REAR _____ LBS. AT _____ PSI

(THE VENDOR SHALL SUPPLY TIRE INFORMATION WITH THEIR BID SUBMISSION)

GENERATOR:

MANUFACTURER_____ MODEL_____

CAPACITY_____ LENGTH_____ WIDTH_____ HEIGHT_____

(THE VENDOR SHALL SUPPLY GENERATOR INFORMATION WITH THEIR BID SUBMISSION)

BRAKES:

FRONT: MAKE_____ TYPE_____ SIZE_____

REAR: MAKE_____ TYPE_____ SIZE_____

ANTI-LOCK SYSTEM _____

CAB

MAKE_____ MODEL_____

LENGTH_____ WIDTH_____

TYPE MATERIAL _____ FIXED OR TILT TYPE _____

(THE VENDOR SHALL ATTACH DETAILED CAB LITERATURE WITH THEIR BID).

AERIAL LADDER BODY:

MAKE_____ MODEL_____

TYPE MATERIAL _____ LENGTH _____

WIDTH _____ INSTALLED OVERALL HEIGHT _____

(THE VENDOR SHALL ATTACH DETAILED BODY LITERATURE WITH THEIR BID).

AERIAL LADDER

MAKE_____ MODEL _____

WEIGHT CAPACITY_____ WORKING HEIGHT _____

(THE VENDOR SHALL ATTACH DETAILED AERIAL LADDER LITERATURE WITH THEIR BID).

APPARATUS WEIGHT:

CURB WEIGHT FRONT _____ LBS.

CURB WEIGHT REAR _____ LBS.

AVAILABLE PAYLOAD CAPACITY _____ LBS

(THE VENDOR SHALL SUPPLY WEIGHT DISTRIBUTION DRAWING WITH THEIR BID)

NOTE: WHERE ANY PORTIONS OF THE COMPLETE APPARATUS IS TO BE INSTALLED BY OTHER THAN THE BIDDER OR CHASSIS MANUFACTURER (OEM), THE BIDDER SHALL INDICATE BELOW THE NAMES OF THE ENTITY/SUBCONTRACTOR PERFORMING SUCH INSTALLATION AND THE LOCATION OF THEIR FACILITY. (USE SEPARATE SHEET IF NECESSARY TO LIST **ALL** SUBCONTRACTORS)

NAME OF BIDDER FIRM

SUBCONTRACTOR FIRM

ADDRESS

ADDRESS

ADDRESS

ADDRESS

()
TELEPHONE #

()
TELEPHONE #

PRINT NAME OF AUTHORIZED
REPRESENTATIVE

PRINT NAME OF AUTHORIZED
REPRESENTATIVE

SIGNATURE

SIGNATURE

TITLE

TITLE