

ENGINEERING BUILD SPECIFICATION

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to cover the furnishing and delivery of a complete fire apparatus. These detailed specifications cover the requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor. The manufacturer shall provide loose equipment only when specified by the customer. Otherwise, in accordance with the current edition of NFPA 1901 standards, the proposal shall specify whether the fire department or apparatus dealership shall provide required loose equipment.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 10 years. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built.

The bidder shall also show that the company is in position to render prompt service and to furnish replacement parts.

Each bid shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model, and make of all component parts and equipment.

GENERAL DESIGN AND CONSTRUCTION

The prime vehicle manufacturer shall be responsible for the overall design so that the cab, chassis, pump module, and body are all integrated and function together as a complete fire apparatus.

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

Special consideration shall be given to the following points: Accessibility of the various units, which require periodic maintenance, ease of operation (including both pumping and driving), and symmetrical proportions.

Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair.

The bidder shall make accurate statements as to the apparatus weight and dimensions.

The modular body design shall allow it being removed and remounted to a new chassis if desired.

ENGINEERING BUILD SPECIFICATION

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

General Aggregate Waived
Products/Completed Operations Aggregate \$2,000,000
Personal and Advertising Injury \$1,000,000
Each Occurrence \$1,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage. The policy shall include owner as an additional insured as their interest may appear.

The required limits can be provided by one or more policies provided all other insurance requirements are met.

COMMERCIAL AUTOMOBILE INSURANCE

The successful bidder shall, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile insurance:

Each Accident: \$500,000

Coverage shall be written on a Commercial Automobile form.

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: \$1,000,000
Each Occurrence: \$1,000,000

The policy shall be written on an occurrence basis and at a minimum provide the same coverage's as Bidder's General Liability, Automobile Liability and Employer's Liability policies. Owner shall be included as an additional insured on the General Liability and Automobile Liability policies as their interest may appear. The required limits can be provided by one or more policies provided all other insurance requirements are met.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverage listed above along with its bid. The certificate shall be made out to the purchaser and be an original, no photocopies shall be accepted. The Certificate of Insurance shall provide that owner be given 30 days advance notice of cancellation, nonrenewable, or material change in coverage.

ENGINEERING BUILD SPECIFICATION

WARD WARRANTY OVERVIEW

BASIC BODY WARRANTY

There shall be a basic one (1) year limited warranty provided with the completed apparatus. See included detailed warranty document.

STRUCTURAL WARRANTY

There shall be a structural ten (10) year limited warranty provided with the completed apparatus. See included detailed warranty document.

PAINT WARRANTY

There shall be a paint seven (7) year limited warranty provided with the completed apparatus. See included detailed warranty document.

ELECTRICAL WARRANTY

There shall be an electrical two (2) year limited warranty provided with the completed apparatus. See included detailed warranty document under structural.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating.

The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

Vehicle shall adhere to the following parameters:

- A) The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.
- B) The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.
- C) The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20mph on a level concrete highway. If equipped with an air brake system, it shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

ENGINEERING BUILD SPECIFICATION

PERFORMANCE TESTS AND REQUIREMENTS (Continued)

D) The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

FAILURE TO MEET TEST

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the bidder within 30 days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus.

NFPA 2016 STANDARDS

This apparatus specification includes a commercial chassis that has not been certified to meet the requirements of NFPA 1901 by the chassis manufacturer. Although this chassis may comply with certain aspects of the standard, has not received certification from this chassis manufacturer that all criteria have been met. The body as built by the manufacturer must comply with the NFPA standards effective January of 2016.

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

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points shall be identified on the customer approval print and are shown as approximate.

Actual location(s) shall be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers, or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack. A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating.

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

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

NFPA COMPLIANCY

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

15' CREW FORWARD RESCUE DUTCHESS COUNTY FIRE INVESTIGATION UNIT
ENGINEERING BUILD SPECIFICATION

PRE-CONSTRUCTION CONFERENCE

Ward Apparatus shall have a pre-construction conference prior to start of production. The purpose of this meeting is to finalize all construction details.

The conference shall be held at either the Ward Apparatus Manufacturing Facility or at the Office of Fire Investigation in Dutchess County, New York.

FINAL INSPECTION CONFERENCE

Ward Apparatus shall have a final inspection conference prior to delivery of the completed apparatus. The purpose of this meeting is to review all details of the completed vehicle and to approve delivery of the apparatus.

The conference shall be held at the Ward Apparatus Manufacturing Facility.

APPROVAL DRAWING

A drawing of the proposed apparatus shall be provided for approval before construction begins.

The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

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

APPARATUS COMPLETION

Construction of the apparatus shall be completed within 150 days after the receipt of the chassis at the manufacturer's facility.

INTERNATIONAL CV515 CHASSIS SPECIFICATIONS

The chassis shall be a 2022, International CV515, 4x4 2-Door Chassis supplied as to the attached specifications.

WHEELS

The Chassis supplied with Aluminum Wheels per the attached chassis specifications.

FRONT WHEEL LUG NUT COVERS:

The front wheel lug nuts shall have stainless steel lug nut covers installed.

REAR WHEEL HUB AND LUG NUT COVERS:

The rear wheel hub and lug nuts shall have stainless steel hub and lug nut covers installed.

ENGINEERING BUILD SPECIFICATION

CHASSIS RELATED ACCESSORIES

CAB CONTROL CONSOLE

There shall be one (1) cab control console installed in the chassis between the cab bucket seats. This console shall be fabricated from .125" aluminum and shall be as large as possible and bolted into place.

This console shall have a removable top cover plate, which shall be retained by stainless steel counter-sunk fasteners.

The console shall accommodate all required electrical connections, sirens, light controls, switch banks, multiplex control heads, and any other electrical equipment as specified. Storage for binders and maps to be provided based on available space, to be determined.

A storage area shall be provided at the front of the console for a Fire Investigation Supplied Apple I-Pad.

The console shall be coated with black splatter finish to aid in abrasion resistance.

CAB CONSOLE RADIO PROVISION

The Chassis Cab Center Console shall be designed with a mounting hole for a Fire Investigation Team Supplied APX 6500 Radio Head.

The radio amplifier shall be mounted by the Fire Investigation Team Radio Installer.

12-VOLT POWER LEADS

One (1) set of 12-volt power leads shall be installed on the apparatus. The power leads shall terminate inside the cab center console.

The power leads shall consist of One (1), 12ga. B+ power and One (1), 12ga. ground. Both leads shall be approx. 24.0" long and terminate with solder-less barrel type connectors. The leads shall be connected battery direct and be un-fused.

12-VOLT POWER POINT

One (1), 12-Volt power point shall be provided. The power point shall be cigar lighter type. The power point shall be wired to battery direct, and 15 amp fused.

The power points shall be on the cab center console.

12-VOLT POWER POINT - (USB DUAL PORT)

One (1), USB dual port 12-Volt, 3.1 Amp, power point shall be provided. The power point shall be a dual port USB type. The power point shall be wired to battery direct, and 5 Amp fused.

The power points shall be located on the cab center console.

ENGINEERING BUILD SPECIFICATION

USB-C PORT

A USB-"C" Socket shall be provided, in addition to the supplied 12-Volt Round Socket and the two (2) USB sockets.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light (located in the driving compartment) shall be illuminated automatically per the current edition of NFPA. The light shall be labeled "Do Not Move Apparatus If Light Is On".

This will be an indicator of a "Raised Telescoping Light Pole".

The same circuit that activates the "Do Not Move Apparatus" indicator shall activate a steady tone alarm when the parking brake is released.

BATTERY CONTROL SYSTEM, IGNITION SWITCH

Battery master control shall be through the chassis ignition switch. The chassis ignition key shall activate a heavy-duty relay to provide 12-volt battery power to the vehicle. Battery switch shall consist of a minimum 200-ampere, constant duty solenoid to feed from positive side of battery.

INFORMATION CENTER

All standard switching shall be provided. Neither a color display nor a vacuum florescent display shall be provided with the multiplex system installation.

"DOOR OPEN" WARNING LIGHT

A flashing red indicator light (located on the cab console) shall flash when any compartment door is open.

The same circuit that activates a steady tone alarm when the parking brake is released.

PRE-WIRED ANTENNA CABLES

There shall be two (2) RG58U coax cables pre-wired by the body builder from the chassis roof to the cab center console. Cables to be clearly labeled and secured within the console. Antenna bases to be protected by removable covers.

AIR RESTRICTION INDICATOR

To meet the NFPA requirement, the chassis shall have an air restriction indicator in the cab, visible to the driver.

ENGINEERING BUILD SPECIFICATION

AIR INTAKE EMBER SEPARATOR

The air inlet shall be equipped with a stainless-steel mesh to separate water and burning embers from the air intake system such that particulate matter larger than 0.039" (1.0 mm) in diameter cannot reach the air filter element.

This shall comply with NFPA 1901 and 1906 standards.

WARD NO-SMOKE EXHAUST FILTRATION SYSTEM

A Ward NoSmoke 2 Exhaust Filtration System shall be provided and installed prior to the body mounting.

EXHAUST PIPE EXTENSION

The chassis exhaust pipe shall be extended to the side of the apparatus body to direct exhaust fumes away from the unit. The extension shall maintain the same diameter as the original chassis pipe.

RUNNING BOARDS

Running boards shall be installed beneath the cab and crew area doors on both sides of the chassis. They shall be fabricated from aluminum diamond plate and be structurally reinforced for maximum strength.

The front of each running board shall have an integral splash guard provided.

CAB STEP LIGHTS

Two (2), TecNiq LED step lights shall be provided at chassis entry doors, one (1) each side of the cab.

The step lights shall be activated when the chassis transmission is placed in the "PARK" position.

BACK-UP CAMERA

One (1) Amp 7" color back up camera system, 8212-IR Camera Kit, shall be installed on the apparatus. The camera shall display the real time view of the area directly behind the apparatus. Monitor shall attach to the windshield in replacement of the chassis rear view mirror.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 requires a location for helmet storage be provided. There is no helmet storage on the apparatus as manufactured.

The fire department shall provide a location for storage of helmets.

VEHICLE DATA RECORDER (NOT PROVIDED)

NFPA 1901, 2016 edition, section 4.11.1 requires all apparatus be equipped with an on-board vehicle data recorder. The VDR is intended to be used by the fire department to monitor seat belt use as a tool for enforcing a seat belt policy that enhances the safety of apparatus occupants.

15' CREW FORWARD RESCUE DUTCHESS COUNTY FIRE INVESTIGATION UNIT
ENGINEERING BUILD SPECIFICATION

VEHICLE DATA RECORDER (NOT PROVIDED) (Continued)

The vehicle data recorder is not available as required from the commercial chassis manufacturer. Per Fire Department specification of a commercial chassis, there shall be no vehicle data recorder on the apparatus.

This apparatus shall be non-compliant to NFPA 1901 standards effective at time of contract execution.

Seat Belt Monitoring System (Not Provided)

NFPA 1901, 2016 edition, section 14.1.3.9 requires a seat belt warning system be provided. The seat belt warning device is intended to assist the driver or officer in determining whether all occupants are seated and belted before the vehicle is driven. Without this device, the driver must manually determine that all occupants are seated and belted before the apparatus is placed in motion.

The seat belt warning system is not available as required from the commercial chassis manufacturer, or not requested by the customer. Per Fire Department specification of a commercial chassis, there shall be no seat belt warning system on the apparatus. The purchasing authority is consciously choosing to accept an apparatus without a tool that the NFPA Technical Committee on Fire Department Apparatus believes all fire departments should use to promote and enforce seat belt compliance. This apparatus shall be non-compliant to NFPA 1901 standards effective at time of contract execution.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) DBA above surrounding environmental noise levels.

MAXIMUM SEATING CAPACITY

There shall be a label located in the driver's view specifying the maximum number of personnel the vehicle is designed to carry per NFPA standards.

REMAIN SEATED

There shall be a label located in the driver's view that states "Occupants Must Remain Seated While Vehicle is in Motion".

WHEEL CHOCKS

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

WHEEL CHOCK BRACKETS

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

ENGINEERING BUILD SPECIFICATION**WHEEL CHOCK BRACKETS (Continued)**

The brackets shall be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place.

The brackets shall be mounted in front and rear of the rear wheels under the Left (Road) Side of the apparatus body. (Per Drawing).

TIRE PRESSURE MONITORING DEVICES

The apparatus shall be equipped with an AirGuard LED tire alert pressure management system. When tire is properly inflated, the indicator inside the cap shall be clear.

The sensor shall activate an integral battery-operated LED when the pressure of that tire drops by 8 psi or more.

Valve stem extensions shall be included on outer rear wheels. Sensors to be shipped loose for installation by customer.

MUD FLAPS

Mud flaps shall be installed behind the FRONT and REAR wheels of the apparatus. A polished stainless steel Ward Apparatus logo will be on each rear mud flap.

HIGH IDLE SWITCH

A high idle activation switch shall be provided on the cab console.

TIRE CHAINS

There shall be a set of air operated, automatic tire chains provided and installed on the rear axle. The control for the tire chains shall be located in the apparatus cab and shall be easily accessible to the driver.

The chains shall be Onspot brand.

There shall be six (6) chain lengths approximately 13 inches long that shall be welded to a single steel ring at 60-degree intervals. Each length of chain shall contain up to 10 twisted style links that are square-cut to provide for maximum traction in forward and reverse modes.

There shall be one (1) driver's side and one (1) passenger side mounting bracket. The brackets shall attach utilizing certified grade 8 fasteners manufactured in accordance with SAE specifications.

A continuous duty solenoid shall be provided that, when activated, shall open and allow compressed air to flow to each chain unit. All hardware shall be grade 8 type and within SAE specifications.

ENGINEERING BUILD SPECIFICATION

AIR COMPRESSOR KIT

An On-Spot air kit shall be provided and installed to operate the On-Spot Tire Chains. The kit provides a 12 volt air compressor, automatic pressure regulator, storage tank and mounting brackets, all wire, hose and hardware needed.

The compressor shall be mounted in an area that protects it from corrosion and road debris.

CHASSIS EXHAUST HEAT SHIELD

The chassis exhaust system shall have heat shielding installed between the exhaust pipe and the bottom of the body.

OVERALL HEIGHT

There shall be a label located in the driver's view that states the overall height (in feet and inches) of the vehicle from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

OVERALL LENGTH

There shall be a label located in the driver's view that states the overall maximum length of the apparatus in feet and inches.

OVERALL WIDTH

There shall be a label located in the driver's view that states the overall maximum width of the apparatus in feet and inches.

REMAIN SEATED

There shall be a label located in the driver's view that states "Occupants Must Remain Seated While Vehicle is in Motion".

FASTEN SEATBELT

There shall be a label located in the cab that states "Occupants Must Fasten Seat Belts Before Vehicle is in Motion".

DO NOT RIDE

There shall be two (2) labels located on the rear of the apparatus, one on each side, that states "Danger: Do Not Ride on Rear Step While Vehicle is in Motion - Death or Serious Injury May Result".

ENGINEERING BUILD SPECIFICATION

DELIVERY REQUIREMENTS

VEHICLE ROAD AND SYSTEMS INTEGRITY TESTING

A complete and thorough road test and systems integrity test shall be conducted at the time of vehicle completion, and prior to delivery. The road-test portion shall encompass differing types of road conditions and terrain, including but not limited to hills, curves, rough roads, rural high-speed environments, urban stop and go environments, and other conditions to verify vehicle manufacturing and delivery integrity.

A systems integrity test shall be performed on the completed vehicle. In this test, the completed vehicle shall have all systems checked for proper operation and conformity to manufacturing specs.

This test shall include but not be limited to a full 12-volt electrical test, a full 120-volt electrical test, all doors shall be checked for proper closure, all doors, hatches, bellows, etc. shall have a water test performed to check for leaks, all roll out trays, tool boards, drawers, etc. shall be checked for proper opening and closing, tire chains (if included) shall be operated, and any system having a mechanical function shall be tested.

MANUALS

All manuals related to sub-system components for included optional equipment to be provided at the time of customer acceptance. In addition to the vendor provided paper manuals and instructions an electronic version of these items will be provided, (where possible) on a USB Flash Drive.

BODY DESIGN

The body shall be modular in design, capable of being removed and remounted on a new chassis. Body integrity and strength to be independent of chassis mounting.

Body is specifically designed to enable custom layout of interior compartments.

BODY MATERIALS

The following shall be the minimum acceptable materials, gauge, and finish used:

Aluminum Sheeting - All exterior panels shall be 5052-H32 aluminum of .125" thickness.

Aluminum Diamond Plate - All diamond plate shall be 3003-H14 aluminum of .125" thickness.

Body Mounting - All body mounting bolts to be minimum Grade 5.

Exterior Fasteners – All exterior nuts, bolts, and screws shall be stainless steel.

ENGINEERING BUILD SPECIFICATION**CORROSION PROTECTION**

Electrolysis Corrosion Kontrol (ECK) shall be used to prevent dissimilar metal corrosion. ECK shall be used for door latches, door hinges, trim plates, fenderettes, etc. ECK shall be applied to every external fastener hole prior to component mounting.

BODY SUPER-STRUCTURE

The body super-structure shall be constructed of square aluminum tubing and custom extrusions. All framing and supports shall be welded to create a fully enclosed structure. This construction technique provides high strength and durability and enables custom design of interior compartments.

The side wall structure shall be constructed of 2.0" x 2.0" x .125" 6063-T52 alloy square aluminum tubing, the side wall structure shall be welded and gusseted to the sub structure.

The roof structure shall be constructed of 2.0" x 2.0" x .125" 6063-T52 alloy aluminum tubing in a lateral pattern, maximum 20-inch spacing. The roof structure shall be welded to the side-wall structure.

All side walls shall be surfaced using a .125" aluminum sheet, welded and bonded to body side wall structure. The body roof shall be surfaced using .125" aluminum diamond plate.

A side body impact rail manufactured of 6063-T52 alloy extruded aluminum shall be welded to the apparatus side wall structure. It shall receive the body side sheet by means of a groove, which runs continually fore to aft of the side wall structure.

BODY CORNERS, EXTRUDED

The exterior body corners and roof perimeter shall be capped with a radiused (2.44") custom aluminum extrusion and welded to the wall and roof structure.

Body corners create additional protection from physical and environmental damage to the super-structure.

BODY FLOOR CONSTRUCTION

The sub structure shall be constructed of 2.0" x 2.0" x 1.250" and .250" 6063-T52 alloy square aluminum tubing, welded and gusseted to the side-wall structure for maximum strength and durability.

Two (2) mounting rails of full-length 1.0" x 3.0" 6061-T6 alloy solid aluminum flat-bar shall be welded to the sub structure, the mounting rails to align with the chassis frame rails for mounting of the body to the chassis.

UNDERCOATING

The underside of the vehicle including all metal work shall be sprayed with PPG Corashield P8001 automotive undercoating.

ENGINEERING BUILD SPECIFICATION**UNDERCOATING (Continued)**

The Corashield product is designed to prevent chipping, cracking, or marring of painted and unpainted surfaces after exposure to high impact sand, gravel, and other abrasive materials. This undercoating shall aid in preventing corrosion and will provide a sound and vapor barrier to the aluminum body structure.

BODY FRONT SHEETING

The front body sheet shall be fabricated of .125" smooth aluminum and painted job color.

STONE GUARDS

The front body corners shall have .125" aluminum diamond plate protective guards. The stone guards shall be bolted to the body and provide coverage at a minimum of 24" high from the base of the body.

BODY REAR SHEETING

The rear body sheet shall be fabricated of .125" smooth aluminum sheeting and prepared for the NFPA required Chevron Stripping. (No Painting required).

There shall be a kick plate fabricated of .125" aluminum diamond plate, located below the rear opening.

COMPARTMENT TOPS SHEETING

The compartments tops sheeting shall be fabricated of .125" aluminum diamond plate and shall be fully welded in place.

PPG PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character.

The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons.

ENGINEERING BUILD SPECIFICATION**PPG PAINT SPECIFICATIONS (Continued)**

The products shall have no adverse effects on the health nor present any unusual hazard to personnel when used according to manufacturer's recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the bid.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Safety Data Sheet".

The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications.

Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials). BMS 10-72A (Boeing Material Specifications).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body will be painted in a down draft type paint booth to reduce dust, dirt, or impurities in the finish paint.

The painted surfaces shall have a finish with no runs, sags, craters, pinholes, or other defects. The coating will meet the following test performance properties as a minimum standard.

DRIP RAILS

There shall be polished aluminum rain gutters installed on the side and rear of the body, the rain gutters shall be fastened to the body and removable in case of damage.

Rain gutters that are an integral part of the roof radius will not be acceptable due to the difficulty in replacing if damaged.

RUB RAILS

A two (2) part impact and rub rail system shall be used for body side protection. A polished aluminum rub rail .75" thick x 3" wide shall be bolted to the body "impact" rail to aid in collision protection.

The outside vertical edges shall be chamfered for an aesthetic appearance and to reduce the chance of personnel injury.

Black Scotchlite reflective striping to be applied to the recessed center of rub rail to provide additional body side illumination. An additional four (4) reflectors to be installed, two (2) each side of body.

ENGINEERING BUILD SPECIFICATION

WHEEL WELL LINERS

Bolted, removeable aluminum inner liners shall be provided at both rear wheel wells.

WHEEL WELL SURROUND - PANELS PAINTED

The body panels that surround the wheel wells shall be painted with no trim overlaid on the body panel.

FENDERETTES

The wheel well openings shall be trimmed with polished stainless steel fenderettes, bolted into place.

BODY MOUNTING

The body shall be mounted to the chassis frame at not less than six (6) locations, three (3) on each side. The mounts shall secure the 1.0" x 3.0" 6061-T6 alloy solid aluminum flat-bar of the floor sub-frame to the chassis frame.

Neoprene pads shall be furnished and installed between the body and the mounts to prevent electrolysis and to minimize noise transfer.

BODY COMPARTMENT CONSTRUCTION

The body compartment shall be enclosed with .125" aluminum sheet. Each compartment floor shall be covered with .188" aluminum sheet for added weight carrying capability, with all seams fully sealed.

The body compartments shall be of a sweep-out design and include a stainless-steel door sill to protect the lower door opening area. The door sill configuration shall have a raised peak to reduce water intrusion under the door when in the closed position.

Wiring channels shall be provided where necessary and shall be screwed in place for ease of access.

BODY COMPARTMENT COATING

All body compartments shall be fully coated with durable multi-tone "RED DOT" splatter finish to aid in abrasion resistance. A sample shall be provided for customer approval.

BODY COMPARTMENT VENTING

Each compartment that extends below the chassis frame shall have a removable louvered vent panel with a replaceable filter.

ADJUSTABLE SHELF CHANNEL

Vertically mounted Uni-Strut channel shall be provided and installed in all exterior compartments where necessary for the installation of infinitely adjustable shelving and trays.

The channels shall be of such design to allow square type spring loaded, self-tightening nuts to be attached inside of the channel.

ENGINEERING BUILD SPECIFICATION

ROLL-UP DOOR CONSTRUCTION, HANSEN

The compartments shall be equipped with custom-built Hansen International Inc. roll-up doors.

Hansen International is an ISO-9001 certified company and the doors are manufactured in the United States. The door design has been tested to at least 100,000 cycles. Each door shall have a serial number label and shall carry warranty of ten (10) years.

A 24-hour replacement part service program is available.

Door Construction-Smooth:

Each door shall be constructed of double walled and concave hard-anodized aluminum extrusion laths with a smooth exterior surface. The interlocking joint extrusion design shall have an integral synthetic spacer seal to reduce noise and prevent weather or debris intrusion in a closed position. Each door lath shall have inter-locking, nested, and replaceable polymer slide guides.

Sides of the door openings shall be of hard anodized aluminum extruded guide channels.

Operating Components:

The easy opening doors shall be equipped with a 4" counterbalance spring in the roller assembly to assist in lifting and help prevent the accidental closing. A full width lift bar shall secure each door.

Door Handle and Latching-Handle Bar:

The latch bar shall consist of a full width .750" diameter stainless steel tube handle with centrally located knurled anti-slip sections and 1.25" hand clearance between handle and the door surface. The lift handlebar assembly shall have four (4) roller wheels to reduce friction and ease opening of door.

Compartment Lighting Switch:

The compartment lights and door-ajar light system shall be activated by an 8-amp rated magnetic switch assembly mounted to the right pennant plate at the top of the door roller area with a permanently installed magnet installed in the top lath. If the bar is not properly closed, it shall activate the "Door Open" light in the cab.

Weather Resistance:

The top door drip rail shall be a hard-anodized aluminum extrusion and shall contain a full width strip of weather seal to minimize water ingress along the top of the door. The top door seal shall be of a two (2) piece 'non-contacting design' to prevent damage to graphics, logos or reflective striping.

Guide channel seals shall be replaceable and constructed of UV resistant rubber with automotive style flocking material for smoothness of operation. The bottom of the door curtain shall have an additional full width UV resistant rubber seal.

Each door shall also be provided with a keyed lock assembly. The body and the roll-up door tracks shall be provided with holes for the roll-up door lock rods to engage.

Shutter door assembly shall be manufactured and assembled in the United States, no exceptions.

ENGINEERING BUILD SPECIFICATION

PAINTED ROLL-UP DOORS – INCLUDING THE DOOR TRIM

The roll-up doors and door trim assemblies shall be finished painted to match the apparatus body color.

EXTERIOR COMPARTMENT SPECIFICATIONS

DRIVER'S SIDE

The compartment over the rear wheels on the driver's side, L1, shall have a clear opening of 50 1/4" H x 41" W transverse across to compartment R2 with a roll-up door.

The driver's side compartment behind the rear wheels, L2, shall have a clear opening of 69 1/2" H x 31" W x 21" D with a roll-up door. (The floor area will be 18" deep due to restrictions of the fuel tank fill hose).

OFFICER'S SIDE

A painted aluminum hinged door (R1) shall be provided at the center right side of the body for interior access of the body. The door shall hinge up and shall have two (2) gas stay rods.

The compartment over the rear wheels on the driver's side, R2, shall have a clear opening of 50 1/4" H x 41" W transverse across to compartment L1 with a roll-up door.

The driver's side compartment behind the rear wheels, R3, shall have a clear opening of 69 1/2" H x 31" W x 21" D with a roll-up door.

REAR

There shall be a compartment located at the rear of the body, RR1, which shall have a clear opening of 59" H x 42.0" W x 37 3/4" D with a roll-up door.

COMPARTMENT L1 SHALL CONTAIN

SLIDE OUT TRAY – HALF DEPTH

A SlideMaster SM3-MP 100% extension slide out tray shall be provided and installed. The tray shall be constructed from 3/16" DA finished smooth aluminum and have a 3" lip on all four sides.

The tray shall have a capacity of 600-pounds and shall be mounted on SlideMaster steel slides.

An IMS push/pull red ball latch on the front of the slide shall lock the tray in the "in" or "out" position.

ADJUSTABLE SHELF

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides.

The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

12-VOLT POWER TAP

A covered 12-volt power tap shall be provided at the upper front wall of this compartment.

ENGINEERING BUILD SPECIFICATION

COMPARTMENT R1 SHALL CONTAIN

SLIDE OUT TRAY – HALF DEPTH

A SlideMaster SM3-MP 100% extension slide out tray shall be provided and installed. The tray shall be constructed from 3/16" DA finished smooth aluminum and have a 3" lip on all four sides.

The tray shall have a capacity of 600-pounds and shall be mounted on SlideMaster steel slides.

An IMS push/pull red ball latch on the front of the slide shall lock the tray in the "in" or "out" position.

ADJUSTABLE SHELF

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides.

The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

12-VOLT POWER TAP

A covered 12-volt power tap shall be provided at the upper front wall of this compartment.

120-VOLT POWER STRIP

A six (6) outlet 120-volt heavy duty power strip shall be provided and installed horizontally at the top of the front side wall.

COMPARTMENT L2 SHALL CONTAIN

ADJUSTABLE SHELVES

Three (3) adjustable shelves shall be fabricated and installed. Each shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides.

The shelves shall be vertically adjustable by mounting to the Uni-Strut channels provided.

DUALOCK DRAWER SET

A custom locking DuaLock drawer unit shall be provided and installed. Aluminum roll-out drawers to have a 300 lb. mobile capacity and 500 lb. static capacity for each drawer. Each drawer shall have a permanent one-way divider and removable dividers in the opposite direction.

Each drawer shall have a single action latch assembly with locking mechanisms on both ends. Drawers latch in the open and in the closed position.

All drawer edges shall be hemmed and constructed of .090-inch thick, 3003-H14 grade aluminum.

The Dualock Drawer Set shall be provided and installed with:

One (1) 6" Drawer, One (1) 5" Drawer, Three (3) 3" Drawers.

ENGINEERING BUILD SPECIFICATION

120-VOLT POWER STRIP

A six (6) outlet 120-volt heavy duty power strip shall be provided and installed horizontally at the rear wall of the compartment just above the tool box location.

NOTE: The lower section of this compartment will be approximately 18" deep to the rear mounted fuel tank and the fuel line connections to the wheel well fuel fill.

COMPARTMENT R2 SHALL CONTAIN

SLIDE OUT TOOL BOARDS

Two (2) Full Height DA finished aluminum pull-out tool boards shall be provided and installed

Each tool board shall be attached to unistrut material mounted on the floor and ceiling of the compartment, extending perpendicular to the rear wall, allowing for horizontal adjustment from front to rear.

The tool board shall be mounted utilizing slides with a locking device at the bottom to keep the board in the stored and extended positions.

COMPARTMENT RR1 SHALL CONTAIN

SLIDE OUT TRAY

A SlideMaster SM3-HD 100% extension slide out tray shall be provided and installed. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides.

The tray shall have a capacity of 2,000-pounds and shall be mounted on SlideMaster Slides. An IMS push/pull red ball latch on the front of the slide shall lock the tray in the "in" or "out" position.

ADJUSTABLE SHELF

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides.

The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

ELECTRIC CABLE REEL

An electric cable reel with roller assembly will be mounted at the top right of this compartment. The reel shall be listed later in these specifications.

POWER STRIPS

Three (3) 120-volt AC six (6) outlet power strips shall be provided. The power strips shall be connected to the hydraulic generator. An automatic transfer switch shall be provided to allow the shoreline connection to charge the power strips when the truck is not in use.

Final mounting locations are to be One (1) under the bench seat at the interior of the body, one (1) in Compartment L2, and one (1) in Compartment R1.

ENGINEERING BUILD SPECIFICATION

12-VOLT POWER TAPS

Two (2) covered 12-volt power taps shall be provided as specified in the compartment specifications.

FORWARD BODY CREW AREA

INSULATION

The body side entry door, body roof, walls, and floor of the crew area shall be insulated with a minimum of 2" polystyrene foam insulation.

INTERIOR FLOOR:

The top of the floor/steps shall be covered with .125" smooth aluminum. The entryway steps, risers and side panels shall be covered with slip-resistant aluminum diamond plate.

The interior floor shall be covered with a heavy duty pebble grain cushioned vinyl material. This material shall also be mounted on the lower six (6)" of the interior walls where they meet the floor. The color of this material shall be a medium gray.

INTERIOR WALLS

The interior of the apparatus interior body shall have a durable, maintenance free, and easy to clean finish. Interior walls to be covered in panels of .125" aluminum with Ward-Tone poly coating and matte finish.

Panels shall be installed on the front wall, and interior side walls. Installation via flush-mount fasteners.

INTERIOR CEILING

The ceiling of the apparatus interior body shall have a durable, maintenance free, and easy to clean finish.

White .090 FRP (Kemply Type) wall board shall be used.

The seams at the ceiling to walls shall be covered with polished stainless steel strips.

STREETSIDE BODY WINDOW, SLIDING, EGRESS:

There shall be one (1) side body window(s) provided and installed on the street side of the body. The window shall be a 22" H x 40" W sliding egress style window. The window shall be "DARK" tinted Solar Gray safety glass encased in a black extruded aluminum frame.

CURBSIDE BODY WINDOW:

There shall be one (1) side body window(s) provided and installed on the curb side of the body. The window shall be a 22" H x 40" W sliding egress style window. The window shall be "DARK" tinted Solar Gray safety glass encased in a black extruded aluminum frame.

ENGINEERING BUILD SPECIFICATION

CURBSIDE ENTRY DOOR CONSTRUCTION

The curb side entry door shall be constructed of reinforced .125" aluminum sheeting and shall be approximately 2" thick. THE USE OF EXTRUSIONS IN THE CONSTRUCTION OF THE DOORS SHALL NOT BE ALLOWED.

The interior of the door shall be insulated to matching the interior side walls.

The door shall be mounted on a full length polished stainless-steel hinge with a minimum of .250" stainless steel pins. The hinges are bolted to the body and doors every four (4) inches.

The door jambs shall have gaskets on all four sides. The inner door panel shall be constructed of 16-gauge brushed stainless steel and shall be bolted to the outer skin of the door.

EXTERIOR BODY HANDRAIL WITH LED LIGHTING

A 30" Hansen backlit body handrail using 1.25" diameter aluminum extrusion shall be provided and installed. The rail shall have a provision to prevent handrail rotation and provide a knurled gripping surface that runs laterally down the length of the extrusion. The handrail shall meet applicable NFPA standards for fire apparatus.

The underside of the railing shall be equipped with a recessed Hansen Model LED 6MM brilliant "RED" LED light.

NOTE: One (1) handrail to be provided on the curb SIDE exterior of the body at the side entry door.

STEP LIGHTS

Two (2), TecNiq LED step lights shall be provided at the door entry area to the apparatus body.

The step lights shall be activated when the chassis transmission is placed in the "PARK" position and the door is open.

HEAD PROTECTOR:

A padded head protector to be provided above the doorway. The bumper shall be made of padded foam and covered with color coordinated vinyl.

WINDOW IN DOOR

One (1) window shall be installed in the upper portion of the door. A 15" H x 30" W stationary window shall be installed. Window shall be "DARK" tinted Solar Gray safety glass encased in a black extruded aluminum frame.

ENGINEERING BUILD SPECIFICATION**POWER DOOR LATCHES - LOCKABLE**

The door latch shall have a stainless-steel recessed pan with "D" handle. Latch to activate rotary locks via a threaded zinc-coated steel rod with yoke end. There shall be a turnbuckle installed on the rod for easy adjustment. The rotary lock shall be mounted on the top and bottom of a vertical door, on both sides of a horizontal door, and shall be mounted within the door pan. Latch to engage in two (2) locations.

The lock on this door shall be power activated with the chassis provided power locking system.

The interior switch panel shall have a switch to control the locking and unlocking of this door.

Interior door handles shall be "Eberhard" series paddle type. The handles shall be constructed of stainless steel and be capable of being locked. The handles shall actuate an "Eberhard" series rotary latch via a threaded zinc-coated steel rod with yoke end. Latch to engage in two (2) locations. There shall be a turnbuckle installed on the rod for easy adjustment.

The door shall be equipped with a Cleveland-style spring loaded door closure. When a door is open, the spring shall hold the door open at 90-degrees to the body. The door closure shall allow the door to be closed by means of one hand.

IF POSSIBLE -This door shall have a lock keyed to match the cab door locks.

GRAB HANDLES

Two (2) knurled type, non-slip, aluminum grab handles with chrome stanchions shall be installed. The grab handle shall be the Hansen knurled non-rotating type, with chrome stanchions.

The two (2) provided handrails shall be non-lighted and shall be mounted as follows:

One (1) shall be mounted on the interior entry right hand wall on an angle to aid in entry to the body

The second hand rail shall be horizontally mounted on the interior box pan of the entry door just under the entry door window.

CEILING DOME LIGHTS, LED, RED/CLEAR

Four (4) Whelen 60CREGCS shall be provided and installed. The lamps shall be 6" round low-profile surface mounted LED dome lights. The dome lights shall have six (6) white and six (6) red diode LEDs. The lights to turn on/off with door open/close or otherwise be controlled by on/off switch on the light head.

DESK

A desk work surface shall be provided that is approximately 28 ½" high, 50" wide and 24" deep. The Desk assembly shall be constructed from 3/16" smooth aluminum and finished to match the interior walls.

The desk surface shall be provided with removable 1/8" thick clear Lexan.

The under side of the desk surface shall be provided with a slide out drawer.

ENGINEERING BUILD SPECIFICATION

DESK (Continued)

A six (6) outlet power strip shall be provided at rear wall of this desk area.

A flexible neck LED 12 volt light assembly shall be provided at the CENTER REAR of the desk.

DESK "L" EXTENSION

The road side interior wall shall be provided with a working surface that will attached to the Main Desk above forming an "L" type extension.

This area shall be approximately 63" long and 18" deep and the same height as the main desk.

The surface of this area shall be provided with 1/8" clear Lexan to match the main desk surface

A 120-volt six (6) outlet power strip shall be provided and shall be CENTER located at the on the wall above this work area.

12-VOLT POWER POINT - (USB DUAL PORT)

Two (2), USB dual port 12-Volt, 3.1 Amp, power points shall be provided. Each power point shall be a dual port USB type. The power points shall be wired to battery direct, and 5 Amp fused.

One set of power points shall be located at the CENTER desk area on the wall in front of the desk. The second set of power points shall be located at CENTER of the "L" Desk on the wall in front of this area.

DESK CHAIR

A heavy duty 4-roller high back chair with arm rests shall be provided. The chair will have black cushions and related hardware.

When not in use the chair shall store under the desk assembly with retaining straps.

RECESSED CABINET

A recessed cabinet shall be provided at the upper rear wall above the interior work deck on the road side of the interior. The dimensions will be approximately 43" wide x 24" deep and 13" high.

The cabinet will have sliding clear Lexan doors.

A six (6) outlet power strip shall be provided in this compartment. The strip shall be located at the top rear wall of this cabinet.

FILE CABINET

A Heavy-Duty 18" deep dual drawer lateral file cabinet shall be provided and installed under the "L" Desk.

ENGINEERING BUILD SPECIFICATION

DRY ERASE BOARD

A 2' x 3' metal framed white dry erase board shall be provided and installed at a pre-con determined location inside the body.

ENTRY SWITCH PANEL

A switch console shall be provided at the door entry to the interior of the body. This console shall control the interior lighting as well as the HVAC System.

SECOND RADIO INSTALLATION

The Fire Investigation Team provided second radio head shall be mounted in an enclosure at the front left of the apparatus body.

12-VOLT POWER LEADS

One (1) set of 12-volt power leads shall be provided for the RADIO INSTALLATION in the body.

The power leads shall consist of One (1), 12ga. B+ power and One (1), 12ga. ground. Both leads shall be approx. 24.0" long and terminate with solder-less barrel type connectors.

The leads shall be connected battery direct through an appropriately rated circuit protection device.

HVAC SYSTEM

A Dometic Penguin II (651816HXX1C0-01) rooftop HVAC unit shall be provided. This unit shall provide Air Conditioning and Heating of the interior work area of the apparatus body.

The unit shall be controlled via a control module at the entry way of the body door.

The unit shall be protected with a 1/8" aluminum treadplate enclosure.

AIR FILTRATION SYSTEM

An air filtration system with two (2) HEPA™ rated air filters will be installed in the interview area of the body. The system shall be activated through a switch at the entry door area switch panel.

The location of this device shall be at the upper front wall of the interior body on a white painted aluminum pedestal. An electrical outlet shall be provided at this location to power the device.

BENCH SEAT

There shall be a two (2) passenger bench seat located in the interior. Each seated position shall include a three-point seat belt. The black padded seat shall be hinged along the back edge and lift up for access to storage underneath.

ENGINEERING BUILD SPECIFICATION**BENCH SEAT (Continued)**

The hinge for the padded seat to be placed approximately six-inches (6") from the rear wall to provide a minimum 90-degree opening of the hinged seat. The heavy-duty vinyl black seat cushion and black vinyl seat back shall have three-inch (3") thick closed cell foam padding laminated to a plywood base.

The area under the seat shall have strip white LED lighting switched either by lifting up the seat base or by opening the body access door.

The under seat storage area shall be provided with a six (6) outlet 120-volt heavy duty power strip. This strip shall be installed horizontally at the top front interior wall of this area.

INTERIOR BODY ACCESS DOOR

The area under the seat shall have access to the exterior of the apparatus through an exterior body door.

The lift-up pan-style door shall be constructed of reinforced .125" aluminum sheeting and shall be approximately 2" thick.

The latch shall be a stainless steel "D" Ring style.

The door shall be mounted on a full length polished stainless-steel hinge with a minimum of .250" stainless steel pins. The hinge is bolted to the body and doors every four (4) inches. The doorjamb shall have gaskets on all four sides.

The door shall be equipped with pneumatic struts to hold the door open 90 degrees to the body.

CREW AREA SEAT BELTS

Seat belts shall be three-point inertia-locking and retractable. Each belt to be NFPA red and meet FMVSS guidelines.

BODY HANDRAILS - LIGHTED

Three (3) Hansen lighted handrails shall be provided. Each handrail has 1 1/4" extruded aluminum non-rotating knurled tubing with chrome plated end stanchions. The stanchion shall have body gaskets to prevent dissimilar metal corrosion.

Two (2) handrails shall be provided at the rear of the apparatus, one (1) each side of the rear compartment.

One (1) handrail shall be provided at the right side body entry door.

Each stanchion shall be bolted into place for ease of removal or replacement.

HEAVY-DUTY "J" HOOKS

Four (4) heavy duty polished stainless steel "J" hooks shall be provided at the front curb side wall for the hanging of coats and jackets. Two (2) shall be mounted high and two (2) mounted low.

ENGINEERING BUILD SPECIFICATION**FUEL FILL DOOR**

A flush mounted fuel filler guard with a hinged door shall be installed over the fuel fill ports.

The door shall be a Cast Products Incorporated or similar. The door shall have a label for FUEL FILL. The labels shall be a product of Innovative Concepts Inc.

Additionally, DIESEL FUEL ONLY engraved plates shall be installed inside the door on a permanently attached label above or near each fill site.

ELECTRICAL SYSTEM – BASE

All wiring and electrical equipment to be compliant with any applicable NFPA 1901 criteria for Special Service Fire Apparatus and SAE standards. All lighting and reflectors shall meet Federal Motor Vehicle Standards. A master warning device switch that energizes all optical warning devices shall be provided.

The warning system on the apparatus shall be capable of two separate signaling modes during emergency operations.

One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right of way.

The other mode shall signal that the apparatus is stopped and is blocking the right of way.

Switching to sense the position of the park position of an automatic transmission. When the master warning system switch is closed, and the parking brake released or the automatic transmission is not in park, the warning devices signaling the call for right of way shall be energized. When the master optical warning system switch is closed, and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of right of way shall be energized. The system shall be permitted to have a method of modifying the two signaling modes.

The warning devices shall be constructed or arranged to avoid the projection of light either directly or through mirrors into any driving or crew compartment(s).

Electromagnetic interference suppression shall be in accordance with SAE J551, performance levels, and methods of measurement of electromagnetic radiation from vehicles and devices (30-1000 MHZ).

Wiring grommets shall be provided through all panels for automotive type wiring with coated automotive type loom. Insulation shall be in accordance with SAE J1128, low tension primary cable, type SXL or GXL, and wired to SAE J1292, Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach wiring for such loading at the potential employed. All wiring installed by the Apparatus Manufacturer shall be stranded copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected.

Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. Wiring shall be color and function coded the entire length with insulated bolted-down type hold-down clamps and mechanically secured connections.

ENGINEERING BUILD SPECIFICATION**ELECTRICAL SYSTEM – BASE (Continued)**

Overall covering of conductors shall be 280 degrees F. Minimum flame retardant, moisture resistant loom.

Hydraulic lines, air system tubing, control cables, and electrical lines shall be clipped to the frame or body structure of the apparatus and shall be furnished with metal protective looms or grommets at each point where they pass through body panels or structural members. Where any through-the-frame connector is provided, any such connector and wiring shall also be protected from shear or tear.

Wiring shall be provided with properly rated low voltage over current automatic resetting protective devices. Such devices shall be readily accessible and protected against excessive heat, damage, and water spray. Switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. All electrical components shall be protected against corrosion, heat, vibration, and moisture.

There shall be a minimum of two (2) spare wires installed in each loom running to the body of the vehicle.

ELECTRICAL SYSTEM – WHELEN CARBIDE

A Whelen Carbide CCSRNT5 Electrical System shall be provided and installed. The system shall consist of all solid-state components contained inside aluminum module. The system shall consist off eighteen (18) output channels and twelve (12) input channels. All inputs and outputs shall be configured into a scale-able electrical harness utilizing plug-in connectors.

The system is expandable and shall be capable of performing the following functions: load management sequencing, switch loads, and receive digital and analog signals.

The complete system shall eliminate the need for the following separate components or devices: load manager, load sequencer, warning lamp flasher, headlamp flasher, door open notification system, interlock modules, separate voltmeter, ammeter, and temperature monitor.

A Whelen CANport OBDII Interface cable shall be included for connection to the vehicle CAN bus system.

In an application where this system is unable to provide the necessary switching then Carling rocker type switches with function labels shall be provided and installed on the center console.

POWER DISTRIBUTION QUARTERS

The vehicle shall be equipped with a Power Distribution Quarters (PDQ) to provide a protected environment for the electrical systems interface to the apparatus body. The PDQ shall have a service access door that is removable via two (2) recessed positive type door latches.

12v lighting shall automatically activate with the removal of the access door. The compartment and access door shall be fabricated from 5052-H32 aluminum alloy, finished to match with interior compartments, and include venting for heat dissipation.

ENGINEERING BUILD SPECIFICATION**POWER DISTRIBUTION QUARTERS (Continued)**

The design shall provide a standardized platform for reliable and repeatable hard-wired or multiplexed electrical systems that can be documented and easily serviced and maintained.

The internal wiring terminals shall be machine or torque-tool crimped to the wire ends and splices shall be protected with heat shrink material.

All body harnesses entering and exiting the distribution panel shall pass through a protected wiring channel directly into the PDQ.

The electrical distribution panel shall incorporate wiring harnesses that meet or exceed NFPA standards while providing a central location for body wiring harnesses.

The distribution panel, including all circuits, shall be documented and made part of the records available at time of delivery.

The location of this box will be under the "L" extension desk along the road side interior wall.

AUTOMATIC TRANSFER SWITCH

There shall be an automatic transfer switch provided and installed to transmit 120-volt power from either the generator or the shoreline. An exclusivity relay shall be installed to protect overlapping circuits and potential feedback problems. The relay shall be an automatic type, circumventing potential operator error.

BATTERY CHARGER

A Kussmaul Auto Charge Low Profile LPC 20 Series Model #091-207-12-194B shall be installed for a single battery system. The charger shall include a status display mounted on the cab console.

Charger to be built in an aluminum enclosure and include an auxiliary 15-amp output circuit with power source selector for operating accessory loads, and front panel connections for a remote display.

Charger output shall pose no interference with other electronic systems on the vehicle.

KUSSMAUL 120-VOLT SUPER AUTO EJECT

Kussmaul Super Auto Eject, model 091-55-20-120, 20-amp, automatic shoreline disconnect will be provided for the on board, 120-volt battery charging system.

The disconnect will be equipped with a NEMA 5-20P male receptacle, which will automatically eject the shoreline when the vehicle starter is energized.

The connection will be equipped with a weatherproof cover. A label will be provided indicating voltage and amperage ratings.

The location of the auto-eject will be at the front lower left side of the apparatus body.

ENGINEERING BUILD SPECIFICATION

COMPARTMENT STRIP LIGHTING

Hansen International "Brilliant White" LED modular compartment lighting shall be installed all compartments to provide even, full height lighting for the compartment without interference from shelves or equipment.

Protected strip to be installed on both sides of the opening and shall run the full height of the compartment. Lights shall be activated by a magnet switch when opening the compartment door.

This lighting system to employ 12V D.C. solid state operation with 24" connective pigtail, 120 lumens per foot, rated at 50,000 hours, waterproof to IP66 rating, and be shock and vibration resistant. Lighting shall snap-in for easy installation and service if necessary, be manufactured in the USA, exceed NFPA 1901 current edition, and be white in color.

ELECTRONIC SIREN

The Whelen Siren Amplifier shall be part of the Whelen Carbide system. A Whelen CANCTL7 remote mounted control head shall be provided and installed in the cab console. This control head shall include functions: wail, yelp, manual, hands-free, piercer tones, PA, and radio-rebroadcast.

The siren shall have the ability to drive a 100-watt output. Control to be backlit with soft LED non-glare lighting.

The operating controls will consist of a power switch, manual button, PA volume switch, horn button, lighting controls, and a microphone.

SPEAKER SYSTEM

There shall be one (1) Whelen SA315P Series siren speaker recessed into the front bumper. Speaker to be polished aluminum, 100-watt, wired to the siren head.

FRONT LIGHT BAR:

Whelen Edge Ultra Freedom F4N0VLED LED NFPA light bar shall be provided and installed on the vehicle.

The light bar shall be 60" long and include:

Two (2) front corner "RED", four (4) front linear, two (2) "RED" and two (2) "WHITE", two (2) rear corner "RED".

FRONT LOWER WARNING LIGHTS:

There shall be Whelen M2 series Super LED lights with chrome bezels installed.

Two (2) warning lights shall be mounted in the grille.

The warning lights shall be Red LEDs with clear lenses.

ENGINEERING BUILD SPECIFICATION

SIDE UPPER WARNING LIGHTS

There shall be Whelen M7 series Super LED upper warning lights with chrome bezels installed.

Two (2) warning lights shall be mounted on the left upper body panel.

Two (2) warning lights shall be mounted on the right upper body panel.

The warning lights shall be Red LEDs with clear lenses.

SIDE LOWER WARNING LIGHTS

There shall be Whelen M7 series Super LED lower warning lights with chrome bezels installed on the vehicle.

Two (2) lights installed, one (1) on each front fender of the chassis.

Two (2) lights installed, one (1) each rear wheel well.

Two (2) lights installed, one (1) at each side of bumper tail.

The warning lights shall be Red LEDs with clear lenses.

REAR LOWER WARNING LIGHTS

There shall be Whelen M6 series Super LED rear upper warning lights with chrome bezels installed.

Two (2) lights shall be mounted in the lower position in the taillight module., one (1) each side.

The left side warning light shall be Blue LEDs with clear lenses.

The right-side warning light shall be Red LEDs with clear lenses.

REAR UPPER WARNING LIGHTS

There shall be Whelen M7 series Super LED rear upper warning lights with chrome bezels installed.

Two (2) lights shall be mounted, one (1) in each upper rear corner.

The left side warning light shall be Blue LEDs with clear lenses.

The right-side warning light shall be Red LEDs with clear lenses.

UPPER BODY SCENE LIGHTS

There shall be Whelen M7 LED series clear scene lights installed.

Two (2) lights shall be mounted with chrome bezels on the upper street side of the body.

Two (2) lights shall be mounted with chrome bezels on the upper curb side of the body.

The scene lights shall be controlled in pairs at the cab console.

ENGINEERING BUILD SPECIFICATION

REAR BODY SCENE LIGHTS

There shall be Whelen M7 LED series clear scene lights installed.

Two (2) lights shall be mounted with chrome bezels on the rear upper body.

The scene lights shall be controlled in pairs at the cab console.

REVERSE ACTIVATED REAR SCENE LIGHTS

The rear scene lights to automatically activate whenever the apparatus transmission is in reverse mode.

REAR D.O.T. QUAD CLUSTER W/WARNING LIGHT - SPECIAL

A four (4) light vertical cluster with chrome bezel shall be mounted on the rear of the body, one (1) each side. The cluster will utilize Whelen M6 series LED lights:

Model #M6BTT LED red combination stop/taillight.

Model #M6T LED amber turn signal.

Model #M6BUW LED white back-up light.

LEFT SIDE Model #M6BC LED "BLUE" warning light.

RIGHT SIDE Model #M6RC LED "RED" warning light.

LED CLEARANCE LIGHTS

Eleven (11) TecNiq S17-0C001 Series LED Low Amp Draw Marker Lamps, seven (7) Red and Four (4) Amber shall be installed to meet ICC, FMVSS, and other applicable regulations.

LED UNDERBODY LIGHTS

There shall be eight (8) TecNiq Series E10-WS00-1 LED underbody lights mounted on stainless steel brackets. The lights shall activate when the transmission is placed in park and the marker lights are on.

Two (2) under the cab entry doors, one (1) each side.

Two (2) under the front body compartments, one (1) each side.

Two (2) under the rear body compartments, one (1) each side.

Two (2) under the rear bumper, one (1) each side.

STEP LIGHTS

Two (2), TecNiq LED step lights shall be provided at the rear of the apparatus body. The lights shall be located.

The step lights shall be activated when the chassis transmission is placed in the "PARK" position.

ENGINEERING BUILD SPECIFICATION

BODY PERIMETER SCENE LIGHTS

There shall be two (2) TecNiq E96-WS00-1 LED surface mount spotlights provided at the rear wheel well areas of the body. Each light shall be mounted tilted down, one (1) each side shining to the rear.

The perimeter scene lights shall be activated when the apparatus is placed in reverse gear.

LICENSE PLATE BRACKET WITH LIGHT:

There shall be a license plate bracket with light supplied and mounted at the rear of the apparatus. A stainless steel light shield shall be provided over the light to direct illumination downward.

LED TELESCOPING SCENE LIGHTS

Four (4) Fire Research Spectra LED Scene Light model SPA530-K20 side mount push up telescopic light shall be installed.

Each light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360-degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 2 3/4" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

Fire Research Spectra LED Scene Light model SPA100-Q15 lamp heads shall be provided. The lamp head mounting arm shall terminate in 3/4" NPT threads. Wiring shall extend from the lamp head mounting arm bottom. The lamp head shall have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spotlight beam pattern. It shall operate at 12/24 volts DC, draw 13/6.5 amps, and generate 20,000 lumens of light. The lamp head shall have a unique lens that directs flood lighting onto the work area and focuses the spotlight beam into the distance.

The lamp head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob.

The lamp head shall be no more than 5 3/8" high by 14" wide by 3 3/4" deep and have a heat resistant handle. The lamp head and mounting arm shall be powder coated. The LED scene light shall be for fire service use.

The telescoping lights shall be mounted as follows:

One (1) on each side of the front of the apparatus body.

One (1) on each side of the compartment door on the rear wall of the apparatus body

Each light shall activate as it is raised up.

SMART POWER HYDRAULICALLY DRIVEN GENERATOR – 6KW

A 6,000 Watt Smart Power model HR 120/240VAC, 60Hz, 1-phase hydraulic generator shall be provided.

The generator tray assembly, including reservoir, shall be delivered in a one-piece module with the cooler/fan assembly mounted such that the hot air is exhausted straight up through the walking grate.

ENGINEERING BUILD SPECIFICATION

SMART POWER HYDRAULICALLY DRIVEN GENERATOR – 6KW (Continued)

The unit shall come complete with generator tray assembly (which includes the generator, hydraulic motor, cooler/fan assembly, electronics package, 10 micron spin-on fluid filter and reservoir), axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses.

The CCC shall be an interactive operator control center, equipped with smart touch solid-state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics. Standard electronics package shall include smart start engagement to reduce mechanical stress (enables generator startup at any RPM), precise voltage and frequency control to maintain frequency control within a 0.2 Hz range, cold start protection system, automatic load and temperature compensation, integrated diagnostics system, and other automated control features to protect system, vehicle and operator.

The generator shall be a commercial type with 2 heavy-duty bearings to ensure exact rotor alignment and of brush-less design to ensure low maintenance. The integrated reservoir shall be equipped with an oil level sight gauge, fill cap and electronic fluid level sensor, which will display a low oil level condition on the CCC display.

The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO). The system shall be capable of producing the full rated power when driven from the vehicle PTO from idle to maximum engine speed. Generator shall make full rated power while vehicle is stationary or in motion.

The system shall be capable of normal operation using a commonly available ATF fluid, such as Dexron III or equivalent.

GENERATOR MOUNTING – RECESSED IN UPPER BODY

The generator shall be recess mounted in the upper body superstructure to the rear of the interior section at the curb side of the apparatus body. See drawing for location.

This recessed area shall be fully welded at each seam and shall have TWO (2) drain tubes in the floor area to the underside of the apparatus body.

UL TESTING 110/220-VOLT & GENERATOR

The apparatus electrical and generator system shall be tested and UL, LLC certified.

HOT SHIFT PTO

The hydraulic generator shall be driven by a "hot shift" PTO installed on the chassis transmission. The PTO shall remain 'engaged' to keep fluid circulating through the system.

ENGINEERING BUILD SPECIFICATION

HOT SHIFT PTO (Continued)

A guarded switch, labeled "GENERATOR EMERGENCY STOP", shall be located on the cab dash or other operator accessible area in the cab. The switch shall be used to disconnect the PTO from the transmission in the event of hydraulic failure (broken hose, etc) during operation or while checking the transmission fluid level.

A second switch with an indicator light shall be provided to excite the generator. The switch shall be labeled "GENERATOR EXCITE".

BREAKER BOX

An electrical load center shall be provided and installed in a protected environment on the apparatus. The load center shall have provisions for eight (8) manual reset type circuit breakers.

BREAKER BOX LOCATION

The load center shall be surface mounted to the upper forward wall of the Compartment L1.

RECEPTACLE POWER

The previously described 120 volt electrical outlets shall be powered by the shoreline connection or the on board AC generator.

An automatic transfer switch shall provide power from the shoreline connection when the apparatus is housed at the station or from the generator when the generator is engaged/excited.

ELECTRAIL CABLE REEL

One (1) Hannay model #ECR series cord reel shall be installed in Compartment R3 of the apparatus as specified earlier.

The reel shall come equipped with 150 feet of yellow 10-4 electrical cord. There shall also be a cord stop supplied with the reel.

The cord shall terminate in a NEMA L14-30R receptacle end.

JUNCTION BOX

A Circle D remote power distribution box with four (4) NEMA 5-15 single receptacles shall be provided for the reel.

The distribution box shall be wired to a 12.00 inch long 4 conductor pigtail with the corresponding NEMA L14-30 series cord end that is supplied for the cord reel.

ENGINEERING BUILD SPECIFICATION

JUNCTION BOX (Continued)

The distribution box shall be stored in a mounting bracket when not in use. The box shall be equipped with a light to indicate when distribution box is energized.

The distribution box shall be equipped with the following receptacles:

Position 1: NEMA 5-15 R

Position 2: NEMA 5-15 R

Position 3: NEMA 5-20 R

Position 4: NEMA 5-20 R

THE STORAGE LOCATION OF THE JUNCTION BOX SHALL BE DETERMINED AT THE FINAL INSPECTION.

CABLE REEL REWIND

A weather resistant push button switch to activate the reel rewind shall be located at the rear road side of the apparatus body in the left side of the tail light module. See drawing.

The switch shall be labeled "CORD REEL".

GUIDE ASSEMBLY

A fixed roller or guide assembly supplied by the reel manufacturer shall be installed. The assembly shall be fastened to the reel frame to guide the cord on and off the spool.

REAR STEP AND BUMPER

The rear bumper and step assembly shall extend full width of the body.

The bumper structure shall be attached to the chassis frame rails using a minimum of 3" structural channel. The bumper and step assembly shall extend beyond the rear of the modular body a minimum twelve inches (9") to protect the body from damage.

The rear step shall be constructed of 1/8" embossed aluminum tread plate material.

REAR TRAILER HITCH

TRAILER HITCH CLASS IV

The apparatus shall be equipped with a receiver hitch installed at the rear of the apparatus mounted directly to the chassis frame rails and below the apparatus in the center.

The receiver shall be classified as a Class IV receiver hitch with a 2.50-inch hitch box opening.

The maximum towing capacity shall be 7500 pounds (3400 kg) with a tongue weight of 750 pounds (340 kg) or 12000 pounds (5443 kg) towing capacity with an approved distributed trailer load.

ENGINEERING BUILD SPECIFICATION

TRAILER LIGHT CONNECTOR

A weather-proof covered combination 7-pin/4-pin trailer plug connector wired to the taillights shall be installed.

TOW EYES - REAR

There shall be two (2) black tow eyes mounted directly to the chassis rear bumper framework.

MUD FLAPS - REAR

There shall be black rubber mud flaps installed for the rear wheels.

WARNING LABELS AND INFORMATION PLATES

All operator controls and switches shall have the appropriate label and corresponding bezel such as pump discharge controls, electrical connections, fuel/DEF fill and exterior switches, etc.

REAR RETRO-REFLECTIVE CHEVRON STRIPING

A minimum of 50 percent of the rear-facing vertical surface, visible from the rear of the apparatus, shall be equipped with Diamond Grade, retro-reflective striping in a chevron pattern, sloping downward and away from the centerline of the vehicle at an angle of 45-degrees.

The stripe shall be 6.00 inches (152.40 mm) wide alternating in colors in compliance with (NFPA) 1901, Standard for Automotive Fire Apparatus.

The color of the reflective chevron will be lime green over red.

REFLECTIVE STRIPING

A four-inch (4") wide white reflective stripe with a one-inch (1") stripe above and below the four-inch (4") stripe, shall be affixed to the sides of the rescue vehicle in a "Z" pattern.

NOTE: Exact design TBD to match the Dutchess County Fire Investigation existing designs

SIDE BODY ENTRY DOOR REFLECTIVE TRIM

White reflective trim shall be installed on the inside of side body entry door. The reflective trim shall be installed as to not be seen or disruptive from the inside of the door while the door is closed but shall provide additional notification to oncoming traffic when the door is open.

CAB DOOR REFLECTIVE TRIM

White reflective trim shall be installed on the inside of each cab door. The reflective trim shall be installed as to not be seen or disruptive from the inside of the cab while the doors are closed but shall provide additional notification to oncoming traffic when the door is open.

This interior door reflective trim shall meet NFPA 1901.

ENGINEERING BUILD SPECIFICATION**LETTERING**

There shall be up to one hundred (100) three inch (3") simulated gold leaf letters applied to the vehicle as directed. The letters shall have black shading.

NOTE: Exact design TBD to match the Dutchess County Fire Investigation existing designs

EQUIPMENT AND EQUIPMENT MOUNTING

The following equipment shall be supplied and installed in the completed apparatus. Final locations shall be discussed at the pre-construction meeting.

1. Six (6) Fiberglass Long Handle Shovels
2. Six (6) Fiberglass Short Handle Shovels.
3. Six (6) Fiberglass Long Handle Square Shovels.
4. Six (6) Fiberglass Short Handle Square Shovels.
5. Four (4) Fiberglass Long Handle Iron Rakes.
6. Four (4) Fiberglass Long Handle Push Brooms Synthetic.
7. Two (2) 6ft. Hooks.
8. Two (2) 8ft. Hooks.
9. Two (2) Closet hooks.
10. Two (2) Sets Irons combo.
11. Two (2) Pick Head Axes, Fiberglass Handles.
12. Two (2) 2 ½ Gallon Pressurized Water Extinguishers.
13. One (1) 20Lb CO2 Fire Extinguisher.
14. One (1) 20Lb ABC Dry Powder Fire Extinguisher.
15. Two (2) Heavy Duty Measuring Wheels.
16. One (1) 12lb Sledgehammer, Fiberglass handle.
17. One (1) 4lb Sledgehammer, Fiberglass handle.
18. Two (2) 24" Wrecking bars.
19. Two (2) 48' Gooseneck wrecking bar.
- 20 One (1) Mattock Pick with fiberglass handle.
21. Six (6) Streamlight Fire Vulcan LED Lanterns #44451.
22. One (1) Little Giant Foldable ladder mounted in transverse compartment.
23. One (1) DC Powered fan.
24. Milwaukee M18 Dual Bay Rapid Charger #48-59-1802 Mounted on slide out shelf with tools.
25. Milwaukee M18 Fuel Super Sawzall # 2722-20 w/ HO XC5.0 Battery Pack #48-11-1850.
26. Milwaukee M18 Fuel ½" Hammer Drill/Driver # 2704-20 w/ HO XC5.0 Battery Pack # 48-11-1850.

DRI-DECK

Red Dri-Deck shall be provided and installed on all compartment floors, trays, and shelves.

RADIO MOUNTING

Dutchess County shall supply a Motorola APX6500 2-Way Radio with Cab and Body control heads to be installed in the completed apparatus.