Freehold Township
Fire District # 2
Freehold, N.J.

Specifications for a
Triple Combination Pumper

May 23, 2023

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1 Intent

It is the intent of this specification to describe a Triple Combination Pumper with enclosed seating for six (6) firefighters to be used by the Freehold Township Board of Fire Commissioners, District No. 2 at various locations throughout the Township of Freehold New Jersey and in regional responses as needed.

This will be a front line apparatus and subjected to extensive daily use, under severe operating conditions. This apparatus, its systems, and components shall be designed and engineered to work properly under the severe operating conditions demanded of fire apparatus and perform its mission with a minimum of down time. Additionally, this apparatus shall have the capability and capacity to carry a full complement of equipment and personnel in a safe and secure manner.

This is an engineer, design, construct, and deliver type specification and it is not the intention of the Freehold Township Board of Fire Commissioners, District No. 2 to write out any vendors or manufacturers of similar or equal equipment. This specification is written around the specific needs of this Fire District and the unique conditions of the municipality that the apparatus will serve. Because of this, price will not be the only consideration in the making of the award for contract. Contract award shall be given to the vendor whose HGAC or Sourcewell submission is most compliant to these specifications at the most competitive price.

Vendors' submissions received will be evaluated by the Freehold Township Fire District No. 2. This evaluation will be based on the response and the responsiveness of each vendor using the following criteria:

- Completeness of the proposal, i.e., the degree to which the vendor responds to all requirements and request for information contained herein.
- Manufacturing time and delivery date
- Vendor's past performance on similar projects
- Vendor's design and engineering reliability factors
- Vendor's logistical and service support
- Pricing

2 Bidding Requirements

Bidder Acknoldg.

2.1 There are two (2) types of check-off columns used in these specifications. Section 2 (Bidding Requirements) and Section 3 (General Requirements) use a single column titled “Bidder Acknoldg.” (Bidder Acknowledges), bidder shall clearly mark the column opposite each numbered or lettered requirement indicating they have read and understood each requirement.

2.1.1 All other specifications sections contain a check off column titled “Bid As” which is divided into two (2) sub columns titled “Spec.” (Specified) and “Equal” (Or Equal).

A) If the bidder’s proposal for the specification item(s) meets or exceeds the specification as written they shall clearly mark the column “Spec.” opposite each numbered or lettered requirement.

B) If the bidder is proposing an alternate to the specification item(s) that meets the intent and technical aspects of the specification item(s) as written but uses different products, construction methods, or materials, or the bidder is making a substitution of specification item(s) they shall clearly mark the “Equal” column opposite each numbered or lettered requirement.

2.2 Any and all “Or Equal” items and/or clarifications to any item(s) in these specifications shall be noted in the check off column and also detailed by specification number on a separate page, or pages titled “Clarifications”. This detailed list shall be attached to and become part of the final bid proposal submitted for consideration.

2.2.1 Bid submitted without the check off columns filled in completely and/or with the “Clarifications” pages missing or not being complete and accurate may result in the bid being considered non-responsive and disqualified.

2.2.2 The purchaser reserves the right to determine which (if any) deviations, or bidder proposed alterations to specification items is acceptable.

2.3 These specifications in their entirety shall be attached to and become part of the bid proposal submitted for consideration.

2.4 Bidders shall submit only one (1) bid, which meets or exceeds the specifications. These specifications are for the purchase of a new, not previously used apparatus. Bids submitted on alternate, stock or demonstrator units are not being solicited and shall be considered non-responsive and may be disqualified.

2.5 Each bid shall be accompanied by a "Contractor's Proposal" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract shall conform. The purchaser's specifications shall, in all cases, govern the construction of the apparatus, unless a properly documented “Or Equal” or a clarification was submitted with the bid response and accepted.

2.5.1 General or complete exceptions and clarifications to these specifications will result in the bid being considered non-responsive and the bid being disqualified.

2.6 For the successful bidder, substitutions, alterations, and/or changes not noted or detailed in the bid proposal will NOT be considered after the contract has been awarded.

2 Bidding Requirements

Bidder Acknoldg.

2.7 Any error, omission or inconsistency that is identified by the bidder shall be reported immediately to the purchaser for correction, prior to bidding.

2.7.1 If time to the bid response date does not allow for an “Addendum to Specifications” to be issued to all prospective bidders detailing any change then the identified error, omission or inconsistency shall be listed as such in the “Clarifications” and a proposal to meet the intent of the specifications shall be included.

2.7.2 For the purposes of this section the time frame for an Addendum to Specifications to be formulated and issued is ten (10) business days or more prior to the bid response date.

2.8 Any questions regarding the specifications prior to the opening of the bids shall be submitted in writing, via electronic mail (e-mail). Answers, clarifications or corrections to these specifications shall not be valid unless they are in written form and signed by the Freehold Township Fire District No. 2’s assigned authority. All questions, answers, clarifications and corrections will be done through e-mail.

2.8.1 In order for Freehold Township Fire District No. 2 to respond to all questions prior to the bid opening, questions must be received no later than seven (7) business days prior to the bid opening.

A) Questions should be submitted to: Dave Goldstein, Chairman Apparatus Committee at: davegoldstein@eastfreeholdfire.com

2.8.2 All submitted question(s) and their corresponding answer(s) will be distributed to each prospective bidder via e-mail. Source of the question will NOT be distributed just the question(s) and the appropriate answer(s)

2.8.3 It is the responsibility of the prospective bidder to notify Freehold Township Fire District No. 2 of any changes to the furnished contact information, change of personnel, change in contact phone numbers, change in email address(s).

2.9 Two (2) copies of the complete bid package shall be submitted. One (1) copy shall be clearly labeled “Original” and the second labeled “Copy”.

2.9.1 The bid marked Original shall contain the original paperwork for any of the municipal/fire district required bonds and other legal requirements.

2.10 A drawing specific to the proposed apparatus shall be submitted with the bid response showing the general design, and layout of the vehicle. The drawing minimum size shall be ANSI Engineering Drawing size “D”, 22” x 34”.

2.10.1 The bid drawing shall include views of the front, top, rear, left and right sides, showing major components, apparatus and compartment layout, body styles, operator locations, and cab interior seating arrangements.

2.10.2 A turning radius report including diagrams submitted.

2.10.3 A minimum of two (2) drawings of each shall be submitted with the bid.

2 Bidding Requirements

Bidder Acknoldg.

2.11 The successful bidder shall defend any and all suits and assume all liability for the use of any patented device, article forming part, any parts or appliance(s) and/or equipment furnished under these specifications.

2.12 These specifications are minimum standards that the manufacturer must meet. If the manufacturer's standard methods of construction and materials exceed these specifications, they are not to be altered, changed or the quality reduced to meet the minimum described.

2.13 The manufacturer(s) shall be solely responsible for the satisfactory design, construction and performance of the apparatus.

2.14 All items listed in the specifications are to be considered mandatory. Any person bidding on this project must agree to price and perform all work and furnish all equipment listed, including the options.

2.14.1 The purchaser will make the final decision on which option or options, if any, are to be included in the purchase of this apparatus.

2.15 The finished apparatus will be inspected upon delivery for compliance with specifications and previously authorized variations. Deviations from the original specification, unless they were originally listed in the bidder's proposal, and accepted or agreed to in written change orders during the construction process will not be tolerated and will be cause for rejection of apparatus.

2.16 No prototype or experimental apparatus will be accepted. The builder must demonstrate that he has successfully produced and sold apparatus, of the same design, and of the same material in the past five (5) years.

2.17 The manufacturer must be satisfactory to the Freehold Township Fire District No. 2 from the standpoint of experience, reliability and demonstrated ability to manufacture equipment, comparable as to size and type, as specified, for the past five (5) years.

2.17.1 A list of fire departments/districts, within a 75-mile radius that includes contact names and telephone numbers, who have purchased apparatus from the bidder over the past five years must be supplied along with the bid for evaluation.

2.18 The Freehold Township Fire District No. 2 reserves the right to reject any and/or all bids received, and accept any bid which, in its judgment, best serves the interest of the fire district or municipality.

2.19 No bid submitted may be withdrawn by the manufacturer or their vendor (dealer) for a period of sixty (60) calendar days, minimum, after the bid opening has taken place.

2.20 Freehold Township Fire District No. 2 is not responsible for the timely delivery of any bid that has been mailed. It is the responsibility of the bidder to make sure their bid arrives at the designated place by the published deadline.

2.21 The final page included with this specification document is not a numbered page and is titled "Bid Proposal". This page is to be filled out in its entirety and placed in your bid submittal as the first page or as the cover page.

3 General Requirements	Vendor Acknoldg.

3.1 The completed apparatus with its systems and components shall meet or exceed the latest edition National Fire Protection Association 1901 Standard for Automotive Fire Apparatus (NFPA 1901), Federal Motor Vehicle Safety Standards (FMVSS) New Jersey State and Local Laws, and or Regulations pertaining to commercial motor vehicles and fire apparatus.

3.2 If these specifications contradict, undermine, or are in conflict with any provisions of the latest edition NFPA 1901, FMVSS, DOT, ICC, New Jersey State and Local Laws, and/or Regulations pertaining to commercial motor vehicles and fire apparatus, the Standards, Laws, and/or Regulations shall be applied.

3.3 The unit proposed shall be manufacturer's latest, top-of the-line design, highest quality and modified where necessary to conform to these specifications.

3.3.1 The apparatus and its systems/components shall be designed and engineered to work properly under severe conditions and shall perform its mission reliably and with a minimum of downtime.

3.4 The following cab assemblies, listed in alphabetical order, are the design and type preferred by Freehold Township Fire District No. 2. This list is not an endorsement of or meant to indicate a preference for a particular unit. Each manufacturer should bid their cab and chassis assembly as listed and shall note any exceptions to the listed requirements.

- HME Ahrens-Fox AF1
- Pierce ArrowXT
- Rosenbauer Commander 4000
- Seagrave Marauder II
- Spartan Gladiator
- Sutphen Monarch

3.5 This apparatus will be subjected to the most severe service. It is required that the vendor and manufacturer(s) select the highest quality of materials and components for use in this vehicle known in the commercial motor vehicle and fire apparatus industries. The design, engineering and the assembly practices used shall be of the highest quality and best practices known to the commercial motor vehicle and fire apparatus industries.

3.6 Selection of components and materials shall not be made to just meet the minimum requirements of this specification, but be made to insure maximum performance, service, reliability, and safety.

3.7 All parts and components not specifically mentioned, which are necessary to furnish and complete the apparatus, shall conform to the best practices known to the commercial motor vehicle and fire apparatus industries in design, strength, quality of material and workmanship.

3.8 All parts and components not specifically mentioned, which are necessary to furnish and complete apparatus, shall be furnished and installed in compliance with latest edition NFPA 1901, FMVSS, DOT, ICC, or New Jersey State and Local Laws, and/or Regulations pertaining to commercial motor vehicles and fire apparatus.

3 General Requirements	Vendor Acknoldg.

3.9 The finished apparatus shall be designed to facilitate repairs, maintenance, servicing and lubrication. All surfaces shall be designed and manufactured to eliminate sharp edges and/or corners capable of producing an injury to personnel or damage to gear and equipment.

3.10 The entire apparatus, with all appurtenances new, complete and ready for operation, shall be furnished and delivered under this specification and shall satisfy all requirements, herein.

3.11 Brand names, manufacturer's names, components, fixtures, fittings, hardware, and methods of construction are specified because of proven experience with the product or methods. Use of these items or methods is believed to be in the best interests of the Freehold Township Fire District No. 2.

3.11.1 Vendor may submit variations, substitutions, and/or clarifications to any specification item as an "or equal". Supporting documentation and engineering reports may be required for components, appliances, parts, materials, or construction methods presented by bidders as equivalent, equal to or better than.

3.11.2 Manufacturer sales and/or advertising brochures are NOT considered proper supporting documentation.

3.11.3 All "or equal" submissions will be reviewed and investigated to make sure that the proposed "or equal" does meet or exceed the technical requirements of that item.

3.11.4 Freehold Township Board of Fire Commissioners, District No. 2 reserves the right to reject any proposal where the "or equal" submissions do not meet the technical requirements of these specifications.

3.12 The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles and between the right and left side of the apparatus, so that all specified equipment, including but not limited to a filled water tank, full complement ofpersonnel, fire hose, tools, and equipment shall be carried without damage to the apparatus.

3.12.1 Weight balance and distribution shall be in accordance with recommendations of NFPA 1901 (current edition) and current standard automotive practices of the commercial motor vehicle and fire apparatus industries.

3.12.2 Weight balance and distribution shall NOT create an overweight condition on either the front or rear axle, between the left and right sides of the apparatus, or on any single wheel point.

3.13 The manufacturer shall perform tool and equipment mounting to insure that weight is evenly distributed on the chassis and that no axles or the vehicle in its entirety are overloaded. If the specifications, equipment mounting or placement create weight problems the Freehold Township Board of Fire Commissioners, District No. 2, shall be advised so changes can be made.

3.14 The completed apparatus shall comply with the following dimensions:

	DIMENSION	MINIMUM	MAXIMUM
3.14.1	Height (lighting and other attached hardware included)		132 inches (11'0")
3.14.2	Cab Width, Skin to Skin	96 inches	99inches
3.14.3	Body Width, Skin to Skin	98 inches	101 inches
3.14.4	Overall Length		420inches
3.14.5	Wheelbase	216 inches	224 inches

3.14.6 Notwithstanding the bid specification the vendor shall ensure the proposed vehicle will fit inside ALL Freehold Township Fire District No. 2 stations without any modifications being made to the building(s) or their approach.

3.14.7 The vendor is responsible for measuring the fire station(s). NO EXCEPTIONS

3.14.8 If the unladen apparatus does not fit into the fire station(s) at delivery it will be cause for rejection of the apparatus.

3.15 Wherever there is a "to be determined" listed in the specifications for the final mounting location of a component or the final determination of which item will be used and how. These decisions will be made by Freehold Township Board of Fire Commissioners, District No. 2 during the pre-construction conference with the successful vendor.

3.16 The use of "pop" rivets and self-tapping screws is not acceptable. All fastening shall be done with bolts, nuts and washers. All hardware shall be properly "graded" for the application with self-locking nuts and/or caged nuts.

3.17 Any and all signage installed on the apparatus shall be of a permanent design and type; cast, engraved or molded.

3.18 A sign easily visible to the apparatus driver and officer while seated and belted shall be provided in the front cab area indicating the height of the apparatus, minimum lettering height on the sign to be ¾".

3.19 Approximate in this specification is defined as plus or minus 5%

3.20 Symbol ± used in the specifications means the manufacturers standard design dimension for that item that is CLOSEST to the specified dimension.

3.21 The angle of departure shall be equal to or greater than the angle of approach.

3.22 Tectyl®, Eck®, isolation coatings, Mylar barrier tape, rubber gaskets, or equivalent, shall be used wherever and/or whenever necessary to isolate dissimilar metals & prevent corrosion/electrolysis.

3.23 A pre-construction conference shall be scheduled a maximum of sixty (60) calendar days from the award of contract.

3 General Requirements	Vendor Acknoldg.

3.24 The acceptance date shall be defined as the date the apparatus is delivered to the Freehold Township Board of Fire Commissioners, District No. 2 and approved by the District, with all specified tool mounting complete, all specified factory training completed and the apparatus ready to be put in service OR the date the apparatus is placed into service, whichever occurs first.

3.25 Bidders shall include with the bid the projected number of calendar days, from the pre-construction conference, to manufacture and deliver the specified apparatus to the manufacturer's declared dealership and/or warranty service center.

3.25.1 This date as adjusted by contract change orders will constitute the delivery date.

3.26 The date of delivery shall be defined as the date the apparatus arrives at the manufacturer's declared dealership or warranty service center from the factory. All specified work and work detailed in change orders complete.

3.26.1 Work that was mutually agreed to by the customer, manufacturer, and dealership that the dealership would complete does not apply to this section.

3.27 On or prior the date of delivery the dealer representative shall notify the purchaser of the number of calendar days that they need to complete any work detailed in the specifications, tool mounting, radio installation, etc., not completed at the manufacturing facility.

3.28 A non-collusive bidding statement shall be furnished, signed, and submitted by each bidder. This document shall be attached to the "Bid Proposal" form and placed in the front for the bid submitted. NO EXCEPTIONS

3.29 The successful bidder must return a wet signed, fully executed contract to the Freehold Township Board of Fire Commissioners, District No. 2 in no more than ten (10) business days from the date a signed copy is received by the successful bidder from Freehold Township Board of Fire Commissioners, District No. 2

3.30 The apparatus price quoted in the vendor's proposal shall include any and all fees, administration costs, and/or processing fess required by HGAC or Sourcewell, perspective bidders may use either.

4 Frame, Front Bumper, and Tow Eyes

Proposed As:	
Spec.	Equal

4.1 Chassis shall be a model year 2023, or newer and have a maximum gross vehicle weight rating (GVWR) of 54,000 pounds.

4.2 The chassis shall be new, heavy-duty, all steel, custom built, and designed specifically for fire apparatus. All standard components and/or any components needed to furnish and deliver a complete unit not specified shall be furnished and installed.

4.2.1 The chassis shall be designed and manufactured by the manufacturer submitting a quote.

4.3 The chassis shall be designed and manufactured for heavy-duty service with adequate strength and capacity for all components, personnel, and equipment. The intended load is to be sustained without damage to chassis during the severe type of service required of fire apparatus.

4.4 Frame shall be fabricated using two (2) parallel “C” channel steel rails. Rails shall be 110,000 psi yield strength steel, minimum. Frame rails shall have minimum dimensions of 10.00” high x 3.0” deep flanges x .375” thick.

4.4.1 Frame shall be equipped with full length and full height “C” channel inner liners to form double frame rails.

4.4.2 Hot dipped galvanized chassis frame rails, crossmembers and chassis component mounting brackets are preferred. Frame and components that are hot dipped galvanized do not need to be painted.

4.4.3 If hot dipped galvanized is not available then the chassis frame rails both inner and outer and chassis component mounting brackets shall be powder coated and painted job color red.

A) Upon assembly, the frame rails shall be sealed with a poly-urethane compound to prevent water, road splash, road salts, and chemical deicing products from migrating between the rails and causing corrosion.

4.4.4 Resistance Bending Moment (RBM) of the combined chassis rail assembly shall be a minimum of 2,250,000 inch pounds.

4.5 The frame shall NOT be altered, cut, or notched any further back from the rearmost front spring hanger other than to accommodate installation of the engine or radiator.

4.6 Frame shall be adequately braced and reinforced with heavy-duty cross-members as required for loading and severe operating conditions. Vehicle components including but not limited to engine, transmission, fire pump shall NOT constitute a crossmember.

4.6.1 A minimum of five (5) cross-members shall be furnished and installed.

4.6.2 All cross-members bolted in place with Grade “8” hardware or “Huck® bolts”.

4.7 Any, notching, cutting, or relief areas required in the frame rails or crossmembers shall be angle cut with a radius at intersection points and edges ground smooth to prevent a stress focal point.

4 Frame, Front Bumper, and Tow Eyes

Proposed As:	
Spec.	Equal

4.8 Holes in the frame rails or crossmembers shall only be made for required, apparatus specific, components only. NO Swiss cheese type rails. Holes shall be confined to the neutral/middle area of the web.

4.9 The area between front axle and rear axle frontmost & rearmost suspension hangers shall be free of any welding, holes or fasteners in the frame flanges.

4.10 No welding shall be incorporated in the attachment of any frame mounted fixtures, components, or crossmembers. All mounting shall be done with grade 8 bolts or Huck® bolts.

4.11 The chassis frame rails shall be, measured, aligned, and cross checked for length and square.

4.12 Front bumper shall be 110,000-psi high tensile steel “C” channel, minimum dimensions of 10” high with 2” flanges and .25” thick, minimum. Designed to protect the front of the apparatus from, head-on & angled, impact loads. Bumper shall be securely bolted directly to frame members with correctly sized grade “8” hardware.

4.12.1 Bumper extension shall be a maximum of 21" from front of cab. Bumper extension shall be fabricated from steel matching the bumper in strength and durability.

4.12.2 Bumper support brackets (extensions) shall be attached directly to the chassis frame and have sufficient strength to withstand high impact. Bumper, extension and brackets shall be bolted in place.

4.12.3 Bumper extension assembly shall be able to support vehicle weight without bending or damage when vehicle has to be lifted by front for towing and be able to withstand towing abuse.

4.12.4 Adequate bumper clearance shall be provided for, so that bumper extensions, bumper returns, or gravel shield does not hit cab when lifted for towing, this is required to provide adequate cab to bumper clearance and eliminate the possibility of damage during towing or lifting.

4.12.5 Cutouts shall be provided for two (2) air horns, recessed behind the bumper and one (1) Federal Signal model BP200-EF compact 200 watt speaker driver, recessed mounted in the front bumper, right side.

4.12.6 All open areas between the front bumper and the cab shall be covered (filled) with NFPA compliant slip resistant aluminum diamond plate (gravel shield). Aluminum diamond plate shall be adequately braced and supported to allow it hold a 500 pound load, two firefighters in gear, without bending for flexing.

4.12.7 Top edge of the front, in its entirety to be overlaid with 1” stainless angle trim finished with red thermo-plastic coating, color: red matching job color as closely as possible.

A) Angle trim shall be overlaid on TOP of the gravel shield.

4.13 Two (2) front tow eyes, 3/4" (minimum), steel plate, chrome plated, shall be furnished and installed directly to the frame or frame extension of the vehicle, below the bumper with a minimum of four (4) grade # 8, 5/8" bolts each.

4.13.1 The front tow eyes are to be rated to allow picking up of the front of apparatus, capable of lift and tow operations.

A) Tow eyes shall not interfere with clearance needed to accept an “Under lift bar” from tow vehicle.

4.13.2 Front tow eyes shall have 2" (minimum) inside diameter holes, all edges cut with a small radius or chamfered to remove any sharpness and prevent the chaffing or cutting of rescue ropes.

4.13.3 Two (2) under lift tow bars receivers shall be furnished and installed on the frame, one (1) on each side of the frame to allow the apparatus to be picked up by a tow vehicle, if needed.

4.14 Two (2) rear tow eyes, 3/4" (minimum), steel plate, painted to match the chassis frame, shall be furnished and installed directly to the frame or frame extension of the vehicle, below the rear step with a minimum of four (4) grade # 8, 5/8" bolts each.

4.14.1 The rear tow eyes are to be rated to allow pulling, winching, or towing the full weight of the apparatus.

4.14.2 Rear two eyes shall be installed so that they can be accessed without, or with minimum interference of the rear body. Access door(s) will be furnished and installed if/as needed.

4.14.3 Rear tow eyes shall have 3" (minimum) inside diameter holes, all edges cut with a small radius or chamfered to remove any sharpness and prevent the chaffing or cutting of rescue ropes.

4.15 There shall be one (1) hose trays fabricated and installed in the front bumper extension, center mounted, flush, polished treadplate cover matching the gravel shield. Treadplate cover fitted with one (1) bent “D” handle polished stainless-steel latch, and one (1) compressed gas door check to hold the cover in fully open and fully closed positions.

4.15.1 Tool tray shall be large enough to accommodate the following load:

A) 150’ of 1 ¾” double jacketed fire hose with nozzle attached.

B) Hose tray may be extended down lower than chassis rails if needed for storage. Keep extension to a minimum.

4.15.2 The interior of the hose tray shall be smooth aluminum with ¼”, minimum, weep holes drilled in all four corners.

A) Front bumper compartment floor to be lined with Versaflex, color red.

4.15.3 One (1) On Scene Solutions 18” Access LED strip light with cast aluminum installed on the lid, interior.

4.15.4 Cover shall be connected to the compartment door warning system, see 13.19.

A) Program the front bumper hose cover to have a five (5) second delay prior activating the compartment open alarm.

4.16 Furnish and install two (2) polished stainless steel guide poles, 42” ± in length, installed on the corners of the front bumper, one (1) each side.

4.16.1 Each pole shall be lighted at the top by an LED fixture, color amber.

A) Amber light activated with respective turn signal.

4.16.2 Plug type electrical connectors used on the base of the guide poles to allow for ease of removal and/or replacement.

5 Front Axle, Suspension, and Steering

Proposed As:	
Spec.	Equal

5.1 The front axle shall be a Meritor MFS-20 and shall have a rated capacity of 21,500 pounds, maximum. Gross Axle Weight Rating (GAWR) shall be certified by axle manufacturer.

5.1.1 Front axle wheel bearings shall be oil lubricated.

5.1.2 Two (2) double acting, gas compressed shock absorbers shall be installed on the front axle, one (1) each side with polyurethane bushings.

A) Shock absorbers shall be mounted in accordance with the shock absorber manufacturer's recommended angles.

5.2 Front axle shall be laser aligned, checked for square to the chassis, and toe-in and caster set on the front tires.

5.3 Front suspension weight rating shall be a maximum of 21,500 pounds.

5.3.1 Front springs shall be elliptical type with military type double wrapped front eye.

5.3.2 Spring pins and shackle pins shall be, non-rotating type, designed for ease of removal. All spring bushings shall be provided with spiral groves and a center circular groove to permit grease to penetrate around the pins completely. Serrated pins with nuts are NOT acceptable.

5.3.3 Access panels shall be provided in compartments or cab if/as necessary to facilitate access to shackle pins and hangers and to permit ready removal of springs.

5.4 The steering shall be hydraulic power assisted, using a TRW # TAS-85 steering box, or equivalent, minimum, and adequately sized for front axle loading.

5.4.1 Steering system will be equipped with a secondary power assisted hydraulic piston to make turning the wheels and controlling the vehicle easier on the operators.

5.4.2 The power steering pump shall be direct drive, Vickers V-20, or equivalent.

5.4.3 Capacity of power steering fluid reservoir shall be four (4) quarts, minimum, the power steering fill and dipstick shall be readily accessible and properly labeled.

5.4.4 There shall be a replaceable power steering fluid filter on the system either built into the fluid reservoir or a spin-on cartridge type filter.

A) Power steering fluid reservoir or spin-on type filter should be located so that it is easily accessible for maintenance and filter replacement.

5.4.5 All power steering hose shall be Parker or equivalent with wire braid jacket and reusable fittings.

5.5 The steering column shall be a Douglas Autotech, seven (7) position tilt, 2.25" telescoping travel type with an 18" padded steering wheel, or equal.

5.5.1 The tilt/telescoping controls shall be a single handle side mounted on the steering column.

5.5.2 The DOT required vehicle horn control shall be in the center section of the steering wheel.

5.5.3 The self-canceling turn signal switch shall be left side mounted on the steering column.

A) Headlight high beam adjustment (dimmer) shall be integral with the turn signal control.

5.5.4 Four-way hazard switch shall be integral to the steering column and labeled.

6 Rear Axle, Suspension, and Components

Proposed As:	
Spec.	Equal

6.1 The rear axle assembly shall be a Meritor Model RS-30-185 single rear axle with a minimum rated capacity of 31,500 pounds, final axle model and weight rating shall be determined by design loads of the apparatus proposed. Gross Axle Weight Rating (GAWR) shall be certified by the manufacturer.

6.1.1 The rear axle shall be single reduction differential, with a gear ratio to allow an approximate top speed of 68 mph at 2100 rpm.

A) Top speed shall be controlled by rear axle gear ratio, which will allow for better acceleration from stop. Electronic limiting of top speed shall NOT be done.

6.1.2 Rear axle equipped with a driver controlled differential lock (DCDL) with alarm.

6.1.3 Rear axles shall have oil lubricated rear wheel bearings.

6.1.4 Rear axle shall be laser aligned and checked for square to chassis.

6.2 Rear suspension Reyco Model 79 KB suspension with a weight rating of 31,500 minimum shall be furnished and installed. Suspension shall be of a multi-leaf, flat steel spring design.

6.2.1 Two (2) Bilstein heavy duty series, double acting, gas compressed shock absorbers shall be installed on the rear suspension, one (1) each side with polyurethane bushings.

A) Shock absorbers shall be mounted in accordance with the shock absorber manufacturer's recommended angles.

7 Brakes, Air System, and Electronic Stability Control

Proposed As:	
Spec.	Equal

7.1 The air brake system and related components including but not limited to: front and rear axle brake assemblies, anti-lock brake components, stability control, secondary braking system shall be designed, engineered, and installed meeting Federal Motor Vehicle Safety Standards (FMVSS) Standard No. 121 “Air Brake Systems”.

7.1.1 All brake and safety system(s) components shall be furnished and installed in compliance with applicable sections of Federal Motor Vehicle Safety Standards (FMVSS), Federal Motor Carrier Safety Administration (FMCSA), Federal Department of Transportation (DOT), Interstate Commerce Commission (ICC), New Jersey State regulations, and NFPA 1901 standards and requirements.

7.1.2 All brake and safety system(s) components are to be installed in accordance with the component manufacturer's instructions and recommendations.

7.2 If there should be any conflict with, FMVSS, FMCSA, DOT, ICC, State, or NFPA 1901 regulations in effect at the time of award of contract, appropriate standards and or regulations shall be complied with. Contractor, in their proposal, shall detail all departures from specifications which are necessary to comply with regulations.

7.3 A Meritor WABCO Two (2) axle, four (4) sensor, four (4) modulator anti-lock braking system with automatic traction control (ATC) shall be installed. Traction control shall apply brake on slipping wheel and drop electronic engine throttle back to prevent wheel spin while accelerating on a slippery surface.

7.3.1 A deep mud and snow switch for ATC system shall be provided. The switch shall have a spring load cover or be a locking type switch to prevent accidental engagement. The switch shall be mounted on the dash board within easy reach of the driver.

7.3.2 Anti-lock Brake System electronic control module shall be mounted in a location, or have a shielded cover to protect it from road spray.

7.4 Meritor WABCO Electronic Stability Control (ECS) system including but not limited to the follow components; lateral accelerometer, steer angle sensor and yaw rate sensor shall be furnished and installed according to manufacturer’s specifications.

7.4.1 ECS is to be engineered for a two (2) axle single piece truck chassis.

7.5 A direct drive, water-cooled, engine oil lubricated compressor, with an 18.7 cubic feet per minute (CFM) capacity, minimum, Wabco or equivalent, governed to a maximum air pressure of one hundred twenty-five (125) PSI shall be provided. Compressor equipped with a replaceable air filter.

7.5.1 An air governor shall be provided to control the cut-in (loaded) and cut-out (unloaded) pressure of the air compressor. Governor calibration shall meet FMVSS requirements.

7.6 Air brake system shall be equipped with an automatic air dryer, Bendix AD-9 heated desiccant type. Air dryer shall be installed before the primary (first) air tank. Filter installed in supply line as close to compressor as possible. This unit shall be mounted for ease of service.

7.6.1 A braided stainless steel covered Teflon line from compressor to air dryer shall be used.

7.7 Four (4) air brake/air system reservoirs shall be provided. A supply reservoir (wet tank), a primary brake reservoir, a secondary brake reservoir, and an additional air reservoir with a minimum total capacity of 4800 cubic inches of air for the brake system shall be furnished and installed.

7.7.1 A reservoir for rapid buildup, equipped with regulator valve, check valve and bypass, shall be provided.

7.7.2 One (1) auxiliary reservoir with a minimum capacity of 2400 cubic inches shall be furnished and installed for a total brake system air capacity of 7200 cubic inches, minimum.

7.7.3 The auxiliary reservoir shall supply operating air to the vehicle air horns, air accessory outlet, air pump shift, and other non-brake air operated devices.

A) Pressure protection valve(s) shall be installed so that the air operated accessories cannot drain air from the brake system when the system air pressure is below of 90 psi.

7.8 Heated automatic moisture ejectors shall be provided on ALL air system storage tanks.

7.9 Manual drains shall supplement the automatic moisture ejectors on all air tanks.

7.9.1 Manual air tank drains shall be plumbed to the area under the L-1 compartment and terminate in self-sealing, pull type valves. The valves shall be mounted to an aluminum backing plate painted job color red and have a ring attached to activate the drain function for each tank.

7.9.2 The backing plate shall be labeled with the air tank number and “Drain Weekly”.

7.10 All air brake tubing, shall meet or exceed the requirements of FMVSS 106, and be DOT approved. Nylon air brake tubing shall be used to connect the various chassis mounted air brake system components on both the primary and secondary braking systems, be color coded, and secured with DOT approved clamps.

7.10.1 To provide flexibility between frame & axle connections air brake tubing used to connect from the chassis mounted modulators to the wheel chambers shall be high pressure rubber hose with steel braided reinforcement and a rubber outer jacket.

7.11 Brake pedal (treadle valve) shall be floor mount type, Bendix or equal.

7.12 Maxi Brake (parking brake) control valve is to be mounted in the manufacturer’s standard location.

7.13 The Maxi Brake (parking brake) system control valve shall be Bendix or equal, YELLOW handle.

7.13.1 Maxi Brake (parking brake) system control valve shall operate as follows:

A) "PULL" to apply the Maxi (parking) brake.

B) "PUSH" to release the Maxi (parking) brake.

7.14 Brake system to be equipped with quick release system and Bendix R-14, or equal, anti-compound valve.

7.15 A dual air pressure gauges, one to indicated primary brake system pressure and one to indicate secondary system pressure, shall be provided on the cab dashboard, and be labeled.

7.15.1 Gauge(s) may be a combination gauge using a single dial face with separate indicators.

7.16 A heavy-duty low air pressure alarm buzzer with RED warning light, in parallel, shall be provided on the chauffeur side of the cab dashboard.

7.17 Front axle shall be equipped with Meritor EX 225 H extreme duty air disc brakes with 17” vented rotors and integral slack adjusters.

7.17.1 Front wheel air brake chambers shall be type 24 long stroke.

7.17.2 Heavy duty, non-asbestos brake pads, rated for fire service applications shall be supplied.

7.18 Rear axle shall be equipped with Meritor Q-Plus S cam style brakes with 16.5” x 8 5/8” heavy duty, non-asbestos brake shoe linings, rated for fire service applications with PlatinumShield™ III coating shall be furnished.

7.18.1 All Q-Plus brake assemblies shall be equipped with Haldex automatic slack adjusters.

7.18.2 Rear axle shall be equipped with type 30/36 long stroke air brake chambers at each wheel.

7.18.3 Brake drums shall be “screw off” design that allows the brake drums to be removed without removing the axle shafts.

7.19 One (1) Kussmaul 120 volt AC air compressor Model # 091-9HP-AD with automatic pressure monitoring and on/off controls, filter separator, and automatic moisture drain shall be furnished and installed to monitor pressure in the vehicle air brake system and maintain system pressure as needed.

7.19.1 Air compressor mounted horizontally behind the officer seat, plugged into a single, 15-amp, 120-volt outlet. Outlet wired to the Kussmaul Super Auto Eject 20-amp plug shared with Kussmaul Battery Charger.

7.20 Vehicle to be equipped with Universal Life Safety Products, LLC automatic reverse braking system, Backstop®. Two (2) rubber bumpers mount on the rear step outboard

of the pull-out step, one (1) each side and will activate vehicle braking system when either bumper comes in contact with people or objects.

7.20.1 Activation will require low pressure contact.

7.20.2 Backstop to operate with the transmission in reverse only.

8 Wheels and Tires

Proposed As:	
Spec.	Equal

8.1 Tires and tire capacities shall meet, or exceed, all applicable NFPA 1901, FMVSS, FMCSA, DOT, ICC, and New Jersey State regulations and standards.

8.2 Front wheels shall be polished aluminum, ten (10) bolt, hub piloted, Aloca finished with Dura Bright ®.

8.2.1 Front wheels shall be properly sized for tires and front axle load rating.

8.2.2 Wheels shall be fitted with polished stainless steel open face center trim rings and lug nut covers.

8.3 The front tires shall be Michelin XZY3, steel belted, radial tires with highway style ribbed tread pattern and rated for regional application in the steer position.

8.3.1 The tires shall be 425/65R22.5, load range “L” and shall have a minimum GAWR of 22,800 pounds.

A) Front tires shall be properly sized for front axle load rating.

8.4 Rear wheels shall be polished aluminum, ten (10) bolt, hub piloted, Aloca finished with Dura Bright ®.

8.4.1 Rear wheels shall be properly sized for tires and rear axle load rating.

8.4.2 Rear wheel shall be mounted with a plastic spacer between wheels to prevent metal to metal contact and electrolytic action.

A) Rear wheels shall be mounted to position tire valves at ninety degrees (90°) to each other.

8.4.3 Wheels shall be fitted with polished stainless-steel, high-hat type center covers for axle hubs and lug nut covers.

8.5 Four (4) rear tires shall be Michelin XDN-2 Grip, steel belted, radial tires with mud and snow tread, rated for drive axle application.

8.5.1 The tires shall be 315/80R22.5, load range L and shall have a GAWR of exceeding 31,000 pounds.

A) Rear tires shall be properly sized for rear axle load rating.

8.6 All wheel and tire assemblies shall be spun balanced prior to mounting on vehicle.

8.7 NFPA compliant tire pressure indicators shall be furnished and installed on all vehicle tires. Inflation indicators shall be furnished once the in-service weight of the vehicle and actual load on each axle is determined.

8.7.1 Apparatus dealer shall be responsible for weighing the apparatus after tools and equipment is mounted, and the apparatus loaded to it’s in service weight, determining the correct tire pressure, and installing the inflation indicators.

8.7.2 Front tires shall be equipped with Real Wheels AirGuard® inflation indicators.

8.7.3 Rear tires shall be equipped with Real Wheels AirGuard® inflation indicators.

8.8 Appropriate tire air pressure signage shall be installed in the driver's area of the cab. This signage shall be placed as to be easily read. Signage shall be of permanent type, engraved or cast, decals are not acceptable.

8.8.1 Apparatus dealer shall be responsible for furnishing and installing the tire air pressure signage after the apparatus has been weighed and it's in service weight is known determining the correct tire pressure.

8.9 Heavy duty mud flaps shall be provided at each wheel location. Mud flaps shall be of anti-sail design.

8.9.1 Front mud flaps shall be mounted at the rear of each front wheel as not to obstruct or be damaged by the turning of each wheel. Front flaps shall be a minimum of 16" wide.

8.9.2 Rear mud flaps shall be mounted at the rear of the rear pair of dual wheels. Rear mud flaps a minimum of 24" wide.

8.9.3 All mud flaps shall cover the entire width of the tire or tires they are mounted behind to minimize splashing and road spray.

8.10 Behind the rear axle assembly a full body width ant-sail type mud flap to be furnished and installed. Full width mud flap will be fitted with a full width stainless steel lip, minimum 6" high with reflective chevrons matching the rear of the apparatus applied.

9 Engine, Cooling System, Exhaust System and Fuel System

Bid As:	
Spec.	Equal

9.1 Engine shall be a model year 2023 (or later) Cummins Diesel Model ISL9 (9 liter), emission compliant motor similar to those normally offered for commercial truck, over-the-road applications and appropriate for use with # 2 ultra-low sulfur diesel fuel. Engine shall comply with all applicable NFPA 1901, Federal, DOT, ICC, State, and Local noise level standards.

9.1.1 Engine shall develop a minimum of:

A) 1250 foot-pounds, minimum, gross torque at a maximum of 1400 RPMs.

B) 450 gross horsepower, minimum

9.1.2 Engine shall be turbocharged using the Holset Variable Geometry Turbocharger (VGT™) by Cummins.

9.1.3 Engine shall be equipped with a three (3) speed compression braking system by Jacobs Engine Brake. All engine systems and components shall by manufactured, supplied by, specified by or approved by Cummins Diesel as being appropriate for this engine.

A) Engine compression brake shall be operated by two (2) switched mounted on the vehicle dashboard, one (1) On-Off switch and one (1) High/Medium/Low switch.

B) Switches shall be clearly labeled with function and be back lit.

C) Switches to be within easy reach of the driver while seated and belted.

9.1.4 Engine starter shall be a heavy duty Delco-Remy Model 35MT. All starter motor and solenoid wiring, switches, relays, terminals, and connectors shall be rated for a minimum of 125% of the designed electrical load.

A) Engine shall be equipped with a safety circuit to prevent engaging the starter motor while engine is running.

9.1.5 Engine shall be governed to prevent overspeed.

9.1.6 Accelerator shall be a Williams WM-526-series, or equivalent, floor mounted, and installed per engine manufacturer's requirements.

9.1.7 Engine mounts shall be heavy-duty polyurethane type, Atro, or equivalent.

9.1.8 Engine shall be equipped with On Board Diagnostics (OBD). OBD system will monitor all engine functions/systems during operation and also monitor the emission system. OBD will alert to apparatus operator to any deficiencies or trouble codes the use of dashboard mounted indicator lamps.

A) OBD will be complaint with requirements of the Environmental Protection Agency (EPA).

9.1.9 Primary Engine Shut Down shall be electronic, a dash mounted switch terminating engine operation through the engine electronic control unit. Primary

engine shut down switch shall be readily identifiable, back lit, clearly and permanently labeled.

A) Primary engine shut down switch shall be readily accessible to the operator while seated and belted.

9.2 A full flow spin-on type oil filter shall be furnished and installed as part of the engine's lubrication system. Oil filter shall be readily accessible to facilitate servicing.

9.2.1 The engine crankcase oil dipstick and fill tube shall be accessible without tilting the cab.

A) Engine oil dipstick and fill tube shall be properly labeled.

9.2.2 Drain plug for oil pan drain shall be magnetic type.

9.3 Cooling system shall have sufficient capacity to meet extended periods of full load operation and fire pumping operations in local ambient temperatures and maintain engine and transmission at temperatures not to exceed maximum or minimum operating temperatures as recommended by Cummins Diesel and Allison Transmission.

9.3.1 Vehicle shall be delivered with the cooling system protected to a minimum of minus thirty-four degrees Fahrenheit (-34°F) with an engine manufacturer approved, extended life coolant. Coolant life shall be five (5) year minimum.

A) Additive shall be added, if necessary, to cooling system to provide proper PH factor.

9.3.2 Nalcool™, or equivalent, spin-on type coolant filter approved by Cummins for the ISL9 motor shall be furnished and installed.

9.3.3 Radiator shall be suitable and approved for heavy-duty truck application and:

A) Removable without removing cab.

B) The filler neck shall be welded in.

C) Adequate for all operating conditions.

D) Approved by engine manufacturer.

E) A low coolant level indicator (sight glass) shall be installed in radiator.

9.3.4 Particular attention shall be directed to the adequacy of radiator mounts and frame supports. Mounts shall be heavy-duty polyurethane type. Radiator frame shall be gusseted in four (4) corners and/or have a system to adequately support and protect radiator from movement and vibration damage.

9.3.5 All radiator, heater, and other cooling system hoses shall be high grade silicone rubber, except those routed through the interior of the cab. Only hoses that feed/return coolant for cab heater(s) and defroster cores may be routed into or through the cab crew area.

A) Coolant hoses routed through the cab crew area shall be extra heavy duty, two (2) ply, EPDM rubber hose with a woven synthetic reinforcement, Gates Firewall® heater hose or equal.

9.3.6 Oetiker all stainless-steel hose clamps or equivalent shall be used on all silicone hoses to prevent cold-water leaks. If not available due to size, stainless steel liner clamps shall be used.

A) Standard worm style all stainless-steel hose clamps may be used on EPDM type heater hoses.

9.3.7 All coolant drain valves shall be “petcock” type, not mounted below frame cross member.

9.3.8 A low coolant light and buzzer alarm system shall be installed in cab and in a visible location on the pump operator’s panel, final device locations to be determined.

9.3.9 Engine cooling fan shall be a Horton variable speed, clutch drive unit, or equal.

9.4 The engine shall be equipped with a high flow air filter. The air filter shall be dry type with a replaceable canister, or filter element.

9.4.1 Air filter shall have outside air intake and be located as to protect it from rain, flooding, and other elements that may get sucked into the intake when operating in severe weather and/or flooding conditions.

9.4.2 Air cleaner should be mounted as to provide easy serviceability.

9.4.3 There shall be an instrument panel air restriction indicator to show when the air cleaner element requires replacement.

9.5 Engine shall be equipped with an Environmental Protection Agency (EPA) complaint, selective catalytic reduction system, be equipped with diesel particulate filter. Engine shall meet or exceed all current on-highway diesel engine emission levels established by the EPA.

9.5.1 Exhaust system shall be designed and approved by Cummins for use with the ISL 9 liter series of motor.

9.5.2 Exhaust system shall be installed according to Cummins current specifications and standards. Exhaust system installation shall be approved by Cummins.
A) Engine exhaust piping and flex tubing shall be stainless steel.

9.5.3 The exhaust system shall be insulated or shielded where necessary to prevent heat transfer to, but not limited to: air compressor, wiring, fuel & air lines, chassis, batteries, radio cables or through cab floor.

9.5.4 Thermal exhaust insulation, wrap around type, aluminized cloth cover capable of withstanding temperatures in excess of 1200º F shall cover exhaust piping beginning after turbocharger extend to where exhaust piping routes below the frame rail.

9.5.5 Adequate heat deflector shield and insulation shall be installed under the crew cab, tool compartment floor, and in pump compartment area to prevent exhaust heat from migrating into those areas.

9.5.6 Exhaust pipe shall terminate with a chrome plated diffuser style tip that will induct fresh air into the exhaust discharge keeping the exhaust temperature below 851° Fahrenheit.

A) Exhaust termination to be compatible with a Plymovent extraction system with a drop tailpipe.

9.6 A steel fuel tank with a capacity of 65 U.S. gallons, minimum shall be furnished and installed. Fuel tank shall be all welded construction, safety type and include a minimum of one (1) internal baffle plate. Fuel tank shall have a sump on the bottom for the collection and removal of sediment. Sump shall have a ½" socket type drain plug.

9.6.1 Fuel tank exterior finished with thermo-plastic coating Line-X, Rhinoliner or equal to give maximum protection from corrosion, color: black..

9.6.2 Fuel tank mounting shall be designed to provide ease of removal. Mounting hardware, mounting straps, and related parts shall be stainless steel, finished painted to match the apparatus chassis and isolated from direct contact with the tank by rubber strips.

9.6.3 Fuel lines shall be Parker, or equivalent, with braided wire jacket and crimp on or reusable fittings, push to connect fittings not acceptable.

A) Fuel tank supply and return flexible lines shall be extended in length six feet (6') minimum to allow the fuel tank to be lowered from the chassis without the need to remove the fuel lines.

9.6.4 Fuel tank fill pipe shall be securely mounted and suitably protected against damage from skid chains or road debris. Fill pipe shall NOT be routed through body side compartments.

9.6.5 Fuel fill tube/pipe fitted with the manufacturer's standard safety fuel cap.

9.6.6 Access panel provided in the compartment body if/as needed to allow access for service or repair of fuel tank, fuel lines & fuel level sending unit.

9.6.7 Stainless Steel or Cast Aluminum fuel door shall be installed in the compartment body, interior conspicuously and permanently labeled "DIESEL FUEL".

9.6.8 Fleetguard Diesel Pro FH236 Series fuel filter, approved by Cummins for use on the ISL Series engine shall be furnished and installed. Unit shall be a diesel fuel filter/water separator with thermostatically controlled heater, water-in-fuel indicator light, properly secured and plumbed into fuel system.

A) Filter heater shall be wired on a separate electrical circuit.

9.6.9 Fuel filter shall be accessible from under the vehicle, for inspection and servicing. The fuel filter/separator unit shall be located on the opposite side of the vehicle from exhaust piping.

A) Fuel filter/separator shall have ¼ turn shut off valves on both the inlet and output.

9.7 Apparatus shall be equipped with a Diesel Exhaust Fluid (DEF) with a minimum usable capacity equal to at least 10% of the fuel tank.

9.7.1 DEF tank shall be heated to prevent freezing of exhaust fluid during winter operations, DEF tank heating to be thermostatically controlled.

A) DEF tank heat shall be sufficient to thaw a full tank that becomes frozen.

B) DEF tank shall have an expansion capacity so that it does not split or become damaged should the DEF freeze.

9.7.2 DEF tank shall be mounted on the same side of the apparatus as the diesel fuel fill BUT shall not be mounted near or next to the diesel fuel fill.

A) DEF tank mounting shall not be in any tool compartments or cause the loss of any body compartment space.

9.7.3 If the DEF is mounted below the chassis frame rails the tank shall be protected by a metal skid plate and forward facing stone guard to prevent accidental damage to the tank from road debris or ground contact.

9.7.4 DEF tank fill shall be color coded industry standard blue and clearly labeled with a permanent engraved sign.

9.7.5 DEF tank fill shall be accessible without tilting the apparatus cab.

9.7.6 DEF tank fill shall be sized so that it will not accept any bulk product dispensing nozzles for any product other than Diesel Exhaust Fluid.

9.7.7 DEF tank fill shall be fitted with a splash guard.

9.8 Two (2) audible alarms with visible warning lights to alert the operator of potentially dangerous engine operating conditions shall be furnished and installed. This will included include but not limited to, low engine oil pressure, high engine operation temperature, and engine overspeed. One (1) set of audible and visual indicators on the cab dashboard and one (1) set on the pump operator's panel. The engine shall not shut down with the activation of any alarms alarm, final device locations to be determined.

10 Automatic Transmission and Power Take Off

Bid As:	
Spec.	Equal

10.1 Transmission shall be Allison Model 3000 Emergency Vehicle Series (EVS) with Generation V all electronic controls.

10.1.1 The transmission gear ratios shall be:

Gear	Ratio
1st.	3.49:1
2nd.	1.86:1
3rd.	1.41:1
4th.	1.00:1
5th.	0.75:1
6th.	0.65:1
Reverse	-5.03:1

10.1.2 The transmission shall be filled with Castrol "Transynd" or an equivalent synthetic transmission fluid.

A) The transmission shall have two (2) internal oil filters.

10.1.3 The transmission dipstick and dipstick tube shall be OEM from Allison and not altered by vehicle manufacturer.

A) The transmission dipstick shall be properly labeled.

10.1.4 Polyurethane type transmission mounts shall be used.

10.2 Transmission shifting shall be done through a pressure sensitive range selector touch pad compatible with Allison Generation V electronics. The pad shall be surface mounted to right of the driver on the engine doghouse and be backlight for night use.

10.2.1 The touch pad shall be compatible with Allison Transmission's "Prognostics" programming and Prognostics features shall be active and programmed by the vehicle manufacturer according to Allison guidelines and recommendations.

10.2.2 Transmission shall be programmed so that the "Economy mode" is omitted, 6th gear is permanently locked out and 5th gear will work only through the mode button. When "D" or drive is selected by the apparatus operator the transmission will operate in 1st through 4th gears.

A) 5th gear will be available through the mode button.

10.2.3 An accelerator inhibitor shall be programmed into the unit to prevent the throttle pedal from being utilized when the vehicle is in the Pump Mode, 4th gear lock-up.

10.3 Transmission shall have an "auto-neutral" function that will place the transmission in neutral if the maxi brake (parking brake) is applied when the transmission is in any gear other than neutral.

10.3.1 Auto-neutral function shall work if any transmission drive gear is selected, forward or reverse.

10.3.2 Once the auto-neutral function has been engaged the apparatus operator shall have to reselect the drive gear once the maxi-brake is released.

10.4 Transmission will automatically select a downshift to second gear when the accelerator pedal is released and the auxiliary braking system is active.

10.5 All hydraulic hoses shall be Parker™ braided hose or equivalent, with reusable fittings for all medium pressure, or high pressure applications on the automatic transmission and the transmission cooler components.

10.6 The transmission shall be plumbed to an internal transmission oil cooler in the radiator, to insure adequate cooling.

10.6.1 Transmission cooling system shall have sufficient capacity to meet extended periods of full load operations, capacity pumping operations with generator in use, and other fire ground operations in local ambient temperatures and maintain transmission at temperatures not to exceed maximum or minimum operating temperatures as recommended by AllisonTransmission.

10.7 Two (2) high transmission oil temperature audible alarms and visual indicators shall be installed. One (1) on the cab dashboard, and one (1) on the Pump Operators' Panel, final device locations to be determined.

10.8 Transmission shall be equipped with one (1) Chelsea Power Take Off unit (PTO). PTO shall be a heavy-duty, pressure lubricated and cooled unit for extended operations and have a continuous duty rating.

10.8.1 PTO shall be equipped with electronic overspeed protection.

10.8.2 PTO for the hydraulic generator shall be of hot shift design, allowing it to be engaged or disengaged while the vehicle is driving or in pump mode for firefighting operations.

10.8.3 Redundant controls for the hydraulic generator PTO one (1) set mounted in the L-1 compartment next to the load center. The generator shall be able to be turned on or off from either location.

11 Driveline

Bid As:	
Spec.	Equal

11.1 Drivelines shall be in compliance with all applicable FMVSS, FMCSA, DOT, ICC, State, Local, and NFPA 1901 standards and regulations.

11.2 Drivelines/Shafts shall be heavy duty and adequate for the vehicle specified, Spicer # 1710 Series, or equivalent, minimum, splined slip joint is to be provided in each shaft assembly.

11.2.1 The drive shaft angles and installation shall comply with fire pump, axle, transmission, and drive line component manufacturer requirements and recommendations.

11.2.2 All splined slip joints on all driveshafts shall be coated with Glide Coat®.

11.3 All drive shafts (each section) shall have suitable guards with catch brackets to prevent damage in event of failure of shaft or universal.

11.3.1 Brackets shall be installed on the forward portion of each section of driveshaft.

11.4 Universal Joints shall be half yolk (mechanic type) U-joints to facilitate removal, replacement and/or repair of the driveshaft and its components.

11.4.1 Grease splatter shields shall be fabricated and installed above each universal joint and slip joint in the driveline.

11.5 All drive shafts to be weighted and balanced.

12 Cab

Proposed As:	
Spec.	Equal

12.1 The cab shall be new, heavy-duty, all aluminum, custom designed and built specifically for fire apparatus, and be the bidding manufacturer's latest model, top of the line. Four (4) door, full tilt, cab forward configuration, designed to protect occupants from impacts due to motor vehicle accidents, rollover, and/or falling debris.

12.1.1 Supplemental Restraint System (SRS) Airbag System designed to improve occupant protection and supplement the seatbelt devices shall be furnished and installed in the apparatus cab. System shall be manufacturer's standard and automatically deploy in the event of a collision or rollover event.

12.1.2 SRS air bag system in its design, installation, activation, and deployment shall comply with all applicable NFPA, Federal Motor Vehicle Safety Standards and Federal Motor Carrier Safety Administration standards for supplemental restraint systems and occupant protection.

12.2 The cab shall have been submitted for and passed (survived) the following crash testing to ensure occupant safety:

12.2.1 The crash test standard shall be the United Nations Economic Commission for Europe (ECE) Addendum 28: Regulation 29 (ECE-29), Revision 1, Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants of the cab of a commercial vehicle.

12.2.2 Testing done in compliance with the Society of Automotive Engineers (SAE) procedures outlined in:

A) SAE J2420 COE Frontal Strength Evaluation

B) SAE J2422 Cab Roof Strength Evaluation

12.3 The following cab assemblies, listed in alphabetical order, are the design and type preferred by Freehold Township Fire District No. 2. This list is not an endorsement of or meant to indicate a preference for a particular unit. Each manufacturer should bid their cab and chassis assembly as listed and shall note any exceptions to the listed requirements.

- HME Ahrens-Fox AF1
- Pierce ArrowXT
- Rosenbauer Commander 4000
- Seagrave Marauder II
- Spartan Gladiator
- Sutphen Monarch

12.4 Cab construction shall be extruded aluminum frame fabricated from 6061-T6 aluminum extrusions, with marine grade 5052-H32 aluminum sheet metal overlay.

12.4.1 Cab exterior sheet metal (skin) shall be 1/8", minimum, 5052-H32 marine grade aluminum. There shall be no plastic or fiberglass used in the cab skin, or fascia.

A) Escutcheons, trim, and enclosures used around headlights, warning lights, and other add-on fixtures may be plastic or fiberglass.

12.4.2 Extruded stainless-steel framing and stainless-steel sheet metal overlay construction may be substituted for aluminum.

12.5 Rear cab wall to center of front axle measurement shall be 68”±.

12.6 Cab shall be of raised roof design and in addition to the construction required for structural stability the roof shall be adequately braced to support the weight of firefighters walking on or accessing the roof without any bending or flexing between framing members.

12.6.1 The raised section of the roof rise shall be 18” ±, manufacturer’s standard dimensions.

A) No glazing in the front section of the raised roof’

B) Glazing in the raised section of the roof shall be on the sides and in crew compartment door ONLY. No front or rear windows in the raised section or the roof.

C) Side windows, manufacturer’s standard dimensions, fixed, standard automotive window glazing, tempered, and tinted.

12.6.2 The right and left sides of the roof shall be provided with a "J" shaped drip molding, molded rain channel, or manufacturer’s standard rain gutter.

12.7 Cab doors shall be manufacturer’s standard, full height, double panel design with metal inner panels.

12.7.1 Cab doors are to be carried on heavy-duty stainless-steel piano type hinges.

A) The door hinges of the cab doors and crew cab doors shall NOT be welded to doors or to the cab, they shall be bolted.

12.7.2 Cab doors are to be equipped with double latching safety catches meeting all applicable safety standards. Cab door latches shall be heavy duty type, designed for a high duty cycle. Doors shall be lockable from the interior.

A) Doors shall only be lockable from the exterior with the use of a key. Door latches which allow the latches to be locked when the door is open and remain locked when the doors are closed are NOT acceptable.

12.7.3 Interior and exterior door handles shall be heavy duty, all metal construction. Exterior handles shall be chrome plated or polished stainless steel with scuff plates.

12.7.4 Cab door interiors shall have single panel design, removable to service, repair or replace internal parts.

12.7.5 Cab doors shall be constructed so that the glass window regulator assembly and inner door hardware are assembled as a unit and readily replaceable.

12.7.6 Heavy duty rubber door weather-stripping shall be installed on all doors.

12.7.7 All doors shall be equipped with one (1) 5", minimum, nylon woven belt type door travel restrictors to prevent door from swinging open beyond a one hundred degree (100°) opening. Minimum door opening shall be eighty-five degrees (85°)

12.7.8 All doors shall have brushed stainless steel windowsills. Edges shall be filed, and corners radius cut to eliminate any sharp surfaces.

12.7.9 Cab door interiors shall be finished to match cab interior and have bright aluminum tread plate overlay on the bottom ¼, of the door, full width.

12.8 All cab doors equipped with electrically operating windows, operated from the door it is installed in and from a window control panel located at the vehicle driver's position.

12.8.1 Manufacturer's standard door glazing to be provided, all door glass shall be tempered, and tinted.

A) Driver's and Officer's door and tinted manufacturer's standard green automotive tint, allowing approximately 75% ± light transmittance.

B) Cab crew doors tinted manufacturer's standard dark gray automotive tint, allowing approximately 45% ± light transmittance.

12.8.3 Upper extension of the rear doors include fixed, tinted glazing. Tint manufacturer's standard dark green or gray automotive tint, allowing approximately 45% ± light transmittance.

12.9 Cab windshield manufacturer's standard design utilizing automotive safety glazing, DOT approved for use as windshields, and tinted automotive green, allowing approximately 75% ± light transmittance.

12.9.1 Two (2) adjustable Lexan sun visors shall be installed, one (1) on each side of cab interior.

12.10 The cab shall have crew cab side windows, one (1) each side of the cab located between the front and rear doors, manufacturer's standard dimensions. Standard automotive safety window glazing to be provided, all glass shall be tempered, and tinted, manufacturer's standard dark gray automotive tint, allowing approximately 45% ± light transmittance.

12.10.1 Crew cab side windows shall be fixed, non-operating.

12.11 The cab shall be equipped with heavy duty, high duty cycle, wet arm, windshield wiper system with integrated windshield washer function. Wipers shall be two-speed, minimum, with intermittent timing control.

12.11.1 Washer fluid reservoir shall be able to be checked and filled without tilting the cab.

12.12 The following DOT approved mirrors shall be furnished and installed on the cab exterior. Maximum allowable width from outside mirror to outside mirror to be one hundred

eighteen inches (118”). Mirror housings, brackets, and mount hardware are to be metal, chrome plated or polished stainless steel.

12.12.1 Two (2), aero-dynamic west coast style, door mounted, side view mirrors with integral convex mirror, Retrac Model 613425, with marker light, or equal, shall be furnished and installed, one (1) on each cab front door utilizing standard mirror brackets with swing away design. `

A) Both the flat glass and convex glass mirrors in each mirror shall be heated and electrically adjustable, side to side and up/down.

B) Mirror controls are to be clearly labeled and mounted within easy reach of the vehicle driver while seated and belted.

12.12.2 An 8” diameter, minimum, “look down” mirror Retrac Model 610775, Signal Stat, Model 7073, or equal, polished stainless convex mirror with a three (3) arm polished stainless steel adjustable stainless steel with bracket assembly shall be installed for viewing front of apparatus from cab interior.

A) Located on the right front corner of the cab and positioned so that the vehicle driver can see the bumper across the front of the cab, final mount location subject to Freehold Township Fire District No. 2 approval.

12.13 Grab railings shall be installed to facilitate entry into and exit from cab and crew cab areas. Grab railings, handles, and hardware shall be NFPA compliant, aluminum, non-slip style. Grab railings shall NOT interfere with the operation of door handles latches, window controls, spotlights and other fixtures.

12.13.1 Exterior grab railings shall be Hansen 4000 LED lighted, color: white, series Anti Slip Grab Rail 18” in length, minimum, with red reflective inserts, or equivalent. Grab rail LED lighting shall be interfaced with the apparatus Maxi (parking) brake so that LED automatically come on when the Maxi brake is set and shut off when the Maxi brake is released.

A) Exterior grab rails shall be located next to each cab door, on the latch side spaced so that there is clearance between a gloved hand holding the grab rail and the edge of the door.

B) All Hansen 4000 Series grab rails to feature red reflective material.

C) All Hansen 4000 Series LED activation on with maxi brake set and off with maxi brake released.

12.13.2 Front interior grab railings shall be located on the drivers’ and officers’ interior door panel at the top and on the door “A” post, inside the cab.

A) Two (2), 9” door mounted grab handles, Hansen 3200 series, or equal, bolted to each door, color: yellow, one (1) mounted horizontally, one (1) mounted vertically, furnished and installed on the driver’s and officer’s door, interior. Manufacturer’s standard mounting locations.

Proposed As:	
Spec.	Equal

B) "A" post grab rails shall be Hansen G930 series Entry Assist minimum of 11" long, or equal.

12.13.3 Rear interior grab rails shall be manufacturer's standard, installed horizontally across the window opening on the rear doors approximately 4" above the window sill, color: black.

A) Secondary interior grab rails angle mounted on all cab door interiors shall be furnished and installed. Grab rails shall be mounted low on the latch side of the door and high on the hinge side, color: yellow

12.13.4 Two (2) 24" LED lighted exterior grab rails shall be furnished and installed, on the rear wall of the cab outboard, one (1) each side, final mount locations to be determined at mid process inspection.

12.34.5 Two (2) additional 36" LED lighted exterior grab rails shall be furnished and installed, final mount locations to be determined.

12.34.6 Two (2) 7" polished stainless steel, suitcase style grab handles furnished and installed on the front face of the cab, above the headlight bezels, one (1) each side.

12.14 Cab entry/exit steps shall be provided at each cab door with NFPA compliant non-slip surfaces. There shall be a minimum of two steps from the cab to the ground.

12.14.1 Spacing between the steps shall not exceed 14.0 inches. Spacing between the bottom step and ground level shall not exceed 22".

12.14.2 If exposed to the weather the step shall be of a non-corrosive metal, open grate design to prevent snow, ice and slush from accumulating on the step surface, and be slip resistant.

12.14.3 All vertical scuff areas inside the cab steps shall be protected with polished aluminum treadplate scuff panels.

12.15 Polished stainless steel fenderettes shall be installed in the front wheel openings. Fender shall be sufficiently wide to completely cover the outside of the front tire, in the straight forward position and reduce wheel splash along the sides of the cab and body.

12.15.1 Outside edge of fenderette, at the wheel opening, shall be rolled inward or filed and polished to eliminate any sharp edges and avoid personnel injury or damage to equipment when cleaning apparatus.

12.15.2 A full width rubber welt shall be placed between the fenderette and cab mounting surfaces.

A) Outside edge of welting shall form a bead between fenderette and cab side face to prevent moisture from entering, inside edge shall have a small, raised bead.

Proposed As:	
Spec.	Equal

12.15.3 A liberal coating of Tectyl®, Eck®, isolation coatings, or equivalent, non-hardening rust proof compound shall be applied to fenderette and wheel opening flange during the assembly process.

12.16 Full semi-circular aluminum inner liners shall be provided in each wheel housing, liners shall be bolted in place, so they may be removed if damaged. Self-tapping sheet metal screws, and/or pop rivets are NOT acceptable.

12.17 Cab tilt mechanism shall be a 12-volt motor driven pump with a self-contained hydraulic reservoir used to raise and achieve at least a 80° cab tilt, and to lower the cab. Cab lift shall be done with dual hydraulic lift cylinders. Tilt mechanism shall NOT operate when the maxi (parking) brake is released.

12.17.1 Cab shall be equipped with automatic latching devices to lock the cab in the fully raised and in the bedded or fully lowered position.

A) Latches to hold the cab in the bedded position shall engage (lock) when the maxi (parking) brake is released.

12.17.2 An integral, manual pump shall be provided to lift the cab, in the event of power loss.

12.17.3 Cab raise and lower control shall be hardwired and mounted behind the right side pump panel, accessed through a hinged door, in a location that allows the operator to stand clear of the moving cab while raising or lowering it.

A) Cab tilt locking device release shall be clearly labeled and allow the operator to stand in a safe zone when releasing it to lower the cab.

12.18 The interior of the entire crew cab shall be properly insulated to achieve high levels of noise reduction and superior levels of thermal insulation. The thermal insulation shall protect against both hot and cold weather conditions and also from engine, transmission, and exhaust system heat being transferred to the cab interior.

12.18.1 Interior insulation, ceiling, walls, and exposed cab structural framing shall be covered with covered with metal panels, upholstery panels, plastic or metal trim, as needed to cover and protect wiring, climate control components, insulation materials, and for esthetics, color: medium gray.

12.18.2 All headliner(s), upholstery panels, metal, panels, and trim shall be easily removable to facilitate maintenance and repairs.

12.18.3 All interior panels below the headliner, not made of metal shall be upholstered with seat matching Durawear™, ballistic nylon, or other high abrasion resistant material.

A) Headliners shall be manufacturer's standard.

12.19 Special attention shall be paid to the insulation of the engine enclosure (doghouse). Type of insulation and installation shall assure a minimum of engine heat and noise infiltrating the cab interior.

12.19.1 The engine cover shall be of sound deadening construction with a heavily insulated underside (engine compartment) of multi-layer heat resistant foam with a foil cover and retention pins.

12.19.2 The interior top and sides of the engine enclosure (doghouse) shall be overlaid with a heavy duty rubber or poly-urethane matting with a backing of heat resistant foam insulation, and a textured surface, same as cab floor.

12.19.3 If the engine enclosure has an access door or other means to permit for the routine checking of engine fluids. The cover shall be of sound deadening construction using the same materials as other components of the engine enclosure.

12.20 The entire floor area of the cab shall be covered with a heavy duty rubber or poly-urethane matting, with a backing of heat resistant foam insulation, and heat reflective foil with a slip resistant textured surface, color: black.

12.20.1 Outside corner seams and high scuff/wear spots shall be protected with a slip resistant metal trim overlay.

12.21 The openings in the cab roof, fire wall, or floor shall be fitted with rubber enclosures or grommets, caulk sealed as needed to provide weather and sound proofing.

12.22 Cab interior and dash shall be manufacturer's heavy duty or extreme duty package with all metal interior construction. This shall include but not be limited to interior door panels, seat risers, engine doghouse, dashboard in front of the driver's and officer's position, center console (center section of dash), and glove compartment. All cab interior metal surfaces shall be finished with a thermos-plastic coating Rhino Liner, Line-X or equal, color: black.

12.22.1 The cab dash shall be low profile in design for maximum driver and officer visibility.

12.22.2 There shall be four (4), cupholders, one (1) for the driver, one (1) one for the officer, and two (2) for the crew area, fabricated from aluminum. Final mounting location to be determined.

12.23 A climate control system shall be furnished and installed in the cab and shall consist of a minimum of 50,000 BTU/hour of air conditioning (cooling), and a minimum of 60,000 BTU/hour of heat. The climate control air handler including air conditioning evaporator and heater core shall be ceiling mounted in the cab, using the cab manufacturer's standard configuration.

12.23.1 The climate control system is to have one (1), engine mounted, belt driven, air conditioning compressor plumbed to a heavy-duty truck type condenser to provide the compressed refrigerant to the system. The air conditioning system shall use R134A Freon

A) The compressor shall cycle every time the vehicle is started, time duration is to be determined.

Proposed As:	
Spec.	Equal

12.23.2 Single condenser with dual (2) fans shall be center mounted on the forward section cab roof. The condensing unit shall have a protective covering, painted to match the color of the cab roof. Condenser fan(s) are to come on when air conditioning is activated.

12.23.3 There shall be an extended life filter receiver/dryer with a pressure relief valve installed to protect the system from contaminates, moisture, and high pressure.

A) Refrigerant plumbing shall have a sight glass for visual inspection.

12.23.4 All climate control plumbing including but limited to air condition high and low pressure lines, heater and defroster core supply and return lines, condensate drains shall be routed in enclosed areas.

12.23.5 Engine coolant supply and return lines to the heater core(s) and/or defroster core routed through the cab shall be ridged piped.

12.23.6 Each engine coolant supply and return line to the heater core(s) and/or defroster core shall have a ¼ turn shutoff valve. Supply line shut-off valves shall be located near the engine port or on the engine block. Shut off controls shall be clearly labeled with permanent type signage.

A) Shut off controls shall be arranged so that any one of the heat/defrost cores can have the water supply shut off to it without affecting any other core(s).

12.23.7 Air conditioning condensate drain lines shall be gravity drain and plumbed to discharge below the bottom of the chassis rails. Condensate drain system utilizing electric pumps or venturi drain are NOT acceptable.

12.23.8 Air conditioning and heating/defrost system air handler(s) shall be equipped with direction vents to control and direct air flow. Care should be taken to assure the system supplies adequate heat to the foot and floor areas of the cab.

A) The air handler or air handlers depend on system design for the climate control system in cab shall each have a minimum of three speed (3-speed) blowers.

12.23.9 Operational controls for the climate control system shall be manufacturer's standard within easy reach of the vehicle driver while seated and belted.

A) Climate system controls shall NOT be incorporated into the V-Mux system.

12.23.10 Two (2) individually switched, all metal construction, two speed (2-speed), six-inch (6") diameter air circulation fans, tilt and swivel adjustable, furnished and installed in the cab. Final mounting location to be determined.

A) Fans shall be switched from the cab center dash utilizing a three (3) position switch, off, low, high.

12.23.11 Sentinel 300, 12-volt DC, air purification unit furnished and installed in cab, mounting location to be determined. Unit wired to the Kussmaul battery charger to remove any parasitic load from the vehicle batteries and set for a one (1) hour run time.

12.24 Cab shall be furnished with seating for six (6) firefighters. All seat positions shall be equipped with three-point (3-point) seat belts utilizing the All Belts To Seat (ABTS) option, seat belt color: red. Seat belts are to be extra-long and able to fit a firefighter dressed in full turn out gear. All seats shall be upholstered with Durawear™, color: black and include a custom logo of the East Freehold Fire Department patch. Note: Bostrom has the seat logo on file.

12.24.1 Driver seat: Shall be H.O Bostrom Model Sierra. Seat shall have 5” of height travel and be 8-way, electrically adjustable.

12.24.2 Officer’s seat: Shall be H.O. Bostrom Model Tanker 550, 2-way manually adjustable set, and auto pivot headrest. This seat shall be equipped with the IMMI SmartDock Locking System for 30-minute SCBA cylinders.

A) The driver’s and officer’s seats shall be installed on full width, enclosed seat pedestals. Enclosed seat pedestals shall have access for storage and be equipped with self-latching doors.

12.24.3 Crew seating two (2), rear facing, shall be mounted in the outboard positions, directly behind the driver’s and officer’s seats, mounted approximately 2” rearward. Seats shall be H.O. Bostrom Model Tanker 500 with a flip-up seat that stays in either the up or down position, and auto pivot headrest. Equipped with the IMMI SmartDock Locking System for 30-minute SCBA cylinders.

A) The rear facing seat seats shall be mounted on open pedestals.

12.24.4 Crew seating two (2), forward facing, shall be mounted in the inboard position, against the rear wall of the cab, approximately 6” apart. Seat shall be H.O. Bostrom Model Tanker 500 with a flip-up seat that stays in either the up or down position, and auto pivot headrest. Equipped with the IMMI SmartDock Locking System for 30-minute SCBA cylinders.

A) The forward facing rear seat(s) shall be installed on a full width, enclosed seat pedestals. Enclosed seat pedestals shall have access for storage and be equipped with self-latching doors.

B) Seat frame access to exterior cab compartments provided.

12.25 The engine doghouse top surface shall be fitted with 3/16” smooth aluminum deck for mounting of tools and equipment as needed. This deck shall be hinged at the rear and spaced off the doghouse one inch (1”).

12.25.1 The deck shall have formed returns on all side and held down by a minimum of four (4), minimum ¼” #3 Phillips flat head screws. Deck finished with a thermo-plastic coating color: black.

12.26 A map/book rack constructed of metal shall be installed on the engine doghouse. This rack shall hold three (3) 3” 3-ring binders and maps. Rack shall have wide Velcro strap to retain the binders. Final design and mounting location to be determined.

12.26.1 Exterior of the rack shall be finished with thermo-plastic coating, color: black, interior shall be smooth aluminum.

12.27 Rear wall of the cab, exterior shall be overlaid with 1/8” polished aluminum treadplate, full height and full width.

12.28 Interior rear wall of the cab, both the left (Driver’s) and right (Officer’s) side shall be fitted with a full height PAC-Trac Series 7000 single sided tool board, mounted using PAC-Trac “Z” mount brackets along all sides, between the interior corner and the forward facing seat.

12.29 Exterior storage compartments installed on each side of the cab, along the rear corner post, full height. Compartments made as large as possible with the approximate dimensions of 78” high, 11” wide, 24” deep in the lower section, 8” deep in the upper section, and lit by a single strip of On Scene Solutions Access LED lighting that runs the full height of the compartment and is mounted in the hinge side door jamb.

12.29.1 Compartment interiors finished with a thermo-plastic coating Rhino Liner, Line-X or equal, color: medium gray.

12.29.2 Compartment doors double box pan design, constructed of same aluminum alloy as the cab, and reversed hinged. Door exterior finished to match the cab.

A) Doors equipped with Eberhard polished stainless-steel bent “D” ring double latching, slam to lock door hardware, or equivalent.

B) Doors shall be carried on full height or width stainless steel piano style hinges, mounted on the trailing (rear) edge of the doors. Hinges are to be bolted to the door and to the cab body. Welding is not acceptable.

C) Doors shall be equipped with a single gas compressed shock absorber style door check to hold the door in the fully open or fully closed position.

D) Door switches that activate the compartment lighting and the compartment open alarm.

12.29.3 The rear wall of the upper compartment section fitted with a single sided, PAC® Trac tool board mounted using “Z” brackets around the entire perimeter of the board.

12.30 Rear corners of the cab, full height to be protected by a polished stainless steel edge guard, approximately 2” X 2”.

13 12 Volt Electrical System

Proposed As:	
Spec.	Equal

13.1 All vehicle electrical systems including but not limited to; starting, charging, accessories, etc., shall be twelve (12) volt, negative (–) ground, using the most current materials and techniques available to the industry.

13.1.1 At minimum, the electrical system and its equipment shall comply with all applicable FMVSS requirements, DOT, ICC, and Federal Motor Carrier Safety Regulations (FMCSR).

13.1.2 The vehicle electrical system shall also conform to all applicable SAE recommended standards and practices, whether or not specifically referenced in this document. Including but not limited to; Low Tension Primary Cable, Heavy Duty Wiring Systems for On Highway Trucks.

13.1.3 The vehicle electrical system shall be designed and installed following the highest practices in material and workmanship known to the fire apparatus and commercial motor vehicle manufacturing industries.

13.2 Wiring shall be stranded copper with high temperature GXL, or equivalent insulating jacket, color coded and imprinted with circuit number & function every 4 inches (4”) for ease of tracing & troubleshooting.

13.2.1 The number code shall be accurately and completely referenced in a detailed wiring schematic provided with the vehicle.

13.2.2 Wiring circuit numbers and function descriptions that are paper or plastic, which are glued or otherwise attached to the wire, are not considered as permanent and will NOT be accepted.

13.3 All vehicle electrical system components including but not limited to; wiring, switches, relays terminals, and connectors shall be rated for a minimum of 125% of the designed electrical load of the circuit it is installed on.

13.3.1 Voltage between the power source and end of line device shall not drop more than 10%.

13.4 All electrical and electronic components shall be selected to minimize electrical loads.

13.5 All grounding to be done according to chassis manufacturers and component manufacturers recommendations. There shall be a minimum of two (2) ground straps installed between each body section; ie: cab, pump enclosure, compartment body, aerial device structure and the chassis.

13.5.1 Parallel ground straps are designed to be redundant in nature and therefore shall NOT share common connection points.

13.5.2 On apparatus with tilt cabs the ground straps have to be installed around the cab pivot point.

13.5.3 All grounding straps and/or grounding wires shall be either un-insulated or black in color. No wires other than the ground wires shall be colored black.

13.5.4 To ensure a strong ground path and reduce voltage drops, all ground wires shall be of the same wire gauge or larger than the power feed wire required for the circuit.

A) Each body to chassis ground strap shall be rated to carry a minimum of 125% of the electrical load for the vehicle section it is attached to.

13.5.5 Separate ground straps needed for various appliances or electrical components will be furnished and installed as needed.

13.5.6 All ground wires in the cab area shall terminate in a common ground buss strip. The ground buss shall be located near the master electrical distribution panel.

A) The random grounding of wires, where convenient for the manufacturer, is NOT acceptable. Note: This does NOT apply to radio equipment grounding.

13.5.7 The grounding network shall be bonded (wired) directly back to the negative battery terminals. The apparatus manufacturer's electrical engineers shall be consulted so that the grounding network does not cause any electro-mechanical interference.

13.5.8 Wherever/whenever a ground strap connection or attachment point is located on a painted surface the paint shall be removed to the bare metal the ground strap(s) installed and the connection point sealed with a marine grade electrical sealer.

13.5.9 Upon vehicle completion the battery ground cable to frame connection points shall be checked to make sure they are clean and tight. Check between the frame ground points and the negative to battery cable terminal with an ohm meter to make sure that there is little or no resistance.

13.6 All high current electrical components including but not limited to electronic control units, relays, and diodes shall be heat sink mounted.

13.7 All vehicle wiring shall be routed along chassis rails and body members in a neat fashion and positioned to minimize damage from road debris, chaffing, and heat generated by other vehicle components.

13.7.1 All wiring shall be enclosed in a protective loom or sheathing and protected by rubber grommets or edge guard where passing through, over, or around any metal.

A) Edge guard or abrasion sleeve shall be installed wherever wiring passes over or around a metal edge.

13.7.2 All wiring shall be securely fastened with insulated metal wire clamps permanently secured to cab, body or chassis as needed.

13.7.3 Extreme care shall be taken in the installation of all wiring and electrical system components in and around the engine, exhaust manifold, exhaust piping, DPF

and catalytic converter that could expose the wiring to severe overheating during long periods of operation.

A) Additional insulation and/or heat deflection panels shall be installed if/as needed.

13.7.4 Wiring routed to avoid road splash and installed in a manner that will ensure no deterioration due to road salts or weather conditions.

13.7.5 No wiring shall be exposed inside of apparatus cab or compartment body.

13.7.6 All 12-volt wiring to the compartment body shall be routed down each side of the exterior body compartments, in electrical wire chases.

A) Wiring in body compartments shall be routed over the exterior compartment doors or installed in enclosed electrical raceways to protect wiring from damage.

13.8 All wire junctions shall be made in weather tight connections designed specifically for use in the automotive industry and have triple seal between the male and female plugs. Deutch gold tip connectors, or equal.

13.8.1 All connecting pin attachments shall be made with the proper crimping tool and done according to connector manufacture's standards.

13.9 Circuit connections shall be made on barrier style terminal blocks utilizing binding post and nuts, barrier style terminal blocks with recessed screw connectors, or J Blocks to ensure positive mechanical connection.

13.9.1 All exposed connection/terminations shall be protected with a marine grade electrical sealer.

13.9.2 No connections shall be made with wire nuts either twist on or crimp style or made by twisting wires together.

13.10 All electrical junction connectors, junction boxes circuit breakers, terminal strips, distribution panels and other electrical systems components shall be located so that they are easily accessible for service and repair work.

13.10.1 All electrical system components shall be clearly labeled with their circuit(s) and function.

13.11 Connections to chassis wiring shall only be made at points recommended by OEM Chassis Builder.

13.12 All wires ends connected to a replaceable device shall have 6 inch pigtails, minimum.

13.13 No splices shall be permitted except for connections at the "end of the line" and for the connection of OEM pigtail type devices. Butt splices are permitted for these connections, only.

13.13.1 Butt splices shall be soldered or made with the proper mechanical double crimp tool.

13.13.2 Self-sealing butt splices will be acceptable at “end of the line” or for the connection of a pigtail device such as a light fixture only if necessary, soldering and heat shrink preferred.

13.13.3 The use of insulation displacement type connectors, such as “scotch lock” type fasteners is NOT acceptable.

13.13.4 All wire butt type connections/terminations shall be covered with sealer type heat shrink tubing or marine grade electrical connection sealer.

13.14 All electronic devices and equipment installed which produces radio frequency interference (RFI) shall have the proper filters, suppressors or shielding to prevent electromagnetic radiation and resulting interference to radios and other electronics.

13.14.1 In addition, all sub-systems including but not limited to chassis component electronic control units, emergency warning light and siren systems, 120-volt electrical system shall be electromagnetic radiation suppressed, filtered, or shielded to prevent interference to radio and telemetry equipment aboard the vehicle and surrounding area.

13.15 Six (6) 12 volt, group 31 low maintenance batteries with a minimum of 900 CCA (cold cranking amps) and 180 amp reserve capacity shall be supplied and installed.

13.15.1 Battery mounting location shall on the chassis frame rails, outboard, under the crew cab step area.

13.15.2 Battery enclosures, battery enclosure covers, all mounting hardware, and cover latches shall be powder coated steel for corrosion resistance, color: black.

13.15.3 Bottom of enclosure/tray lined with Versaflex color red and adequate drain holes provided.

13.15.4 A stainless steel sliding tray shall be provided if/as necessary for easy service access to batteries.

13.15.5 Electronic engine/transmission system shall be powered through chassis batteries. A dedicated battery and isolator is NOT acceptable.

13.15.6 Battery Cables shall be triple 0 gauge (000), minimum. Positive (+) cable shall be red in color, negative (-) cable shall be black in color.

A) Battery cables shall have a protective loom or abrasion guard to protect them from damage as needed.

13.16 One (1), pad mount, C. E. Neihoff, model C531 360 amp alternator, self-exciting, with fan guard, or equivalent, shall be furnished and installed.

13.16.1 The alternator shall produce a minimum of 180 amps at idle.

13.16.2 The belt drive system shall be serpentine Gates Fleet Runner series, or equal.

A) If a V-belt drive it used it must be at least a dual belt drive.

13.16.3 External Voltage regulator, if used, shall be completely accessible for service and replacement.

13.17 A Weldon V-Mux or equal, NFPA compliant, peer to peer multiplex system to control apparatus electrical system and functions shall be furnished and installed. Multiplex system shall interface with chassis electronic control modules (ECMs) including but not limited to engine ECM, transmission ECM, brake system ECM.

13.17.1 Dual multiplex control panel/screens shall be installed on the dash center console, one (1) for the driver and one (1) for the officer. Control panels shall be in clear, unobstructed view and within easy reach of both the driver and officer while seated and belted.

13.17.2 Programming of the features and functions for each screen will be reviewed at the pre-construction conference and final programming must be approved by East Freehold Fire District.

A) The driver's screen shall have a sleep switch for the officer's screen.

13.17.3 NFPA compliant electrical load manager function shall be part of the multiplex system. Load manager shall monitor vehicle electrical system for proper voltage.

A) The load manager system shall sound an audible alarm in the cab and at the pump panel for both low and high voltage conditions.

B) If a low voltage condition is detected the first function shall be for the load manager to engage the automatic high idle, a programmed increase in idle speed to increase alternator output.

C) The "high idle" function shall be interlocked with neutral transmission position, Maxi (parking) brake applied, to permit automatic operation.

D) The load manager shall also be interlocked with the fire pump transmission if fire pump mode is engaged the automatic high idle function shall be disabled so it does not interfere with fire ground operations.

E) High idle may be selected manually by a virtual switch on multiplex control panel. Manual high idle shall engage whether or not a low voltage condition exists, functioning independent of the load manager.

F) If high idle does not correct the condition the system will "shed" or shut off circuits according to a pre-determined program. Load shedding sequence shall be finalized during the pre-construction conference.

13.17.4 Vehicle Data Recorder and Seat Belt Monitoring functions shall be integrated into the multiplex system.

A) Seat belt warning function shall be designed and installed to be tamper resistant. Seat belt warning function shall provide a visual and audible indicator to the apparatus operator of any seat that is occupied, and the seat occupant is not properly belted.

B) System shall report when a seat is occupied, and seat belt is not fastened.

C) System shall also report when a seat belt was fastened prior to the seat being occupied.

13.17.5 Vehicle data recorder shall record the following data once per second and store it in a minimum of a 48-hour loop:

A) Date & Time

B) Vehicle Speed

C) Vehicle Acceleration & Deceleration

D) Engine Throttle Position

E) Engine Speed

F) ABS (anti-lock braking system) event(s).

G) Seat Occupied Status & Seat Belt Status

H) Master Optical Warning Device Switch

13.17.6 The vehicle data recorder shall record the following data once per minute and have memory to store it for a minimum of 100 engine hours:

A) Date & Time

B) Maximum Vehicle Speed

C) Maximum Acceleration & Maximum Deceleration

D) Maximum Engine Throttle Position

E) Maximum Engine Speed

F) ABS (anti-lock brake) Event

G) Seat Occupied with Seat Belt Unbuckled

H) Master Optical Warning Device Switch

13.17.7 Vehicle Data Recorder and Seat Belt Monitoring system information shall be field downloadable with an IBM format Personal Computer using a hardwired interface.

A) Hardware and Software needed to interface a personal computer and to process data reported shall be furnished, installed and/or supplied with apparatus.

13.17.8 Additional features and functions as specified in other sections of shall be included in the multiplex system.

13.18 Rocker switch panel installed either in dash center console and contain a minimum of eight (8) switches, six (6) in the dash center panel and two (2) in the dash right side panel.

13.18.1 All cab switches will be backlit, have pilot lights that illuminates when the switch is in the on position, and be properly labeled. All switches shall be wired through continuous duty relays rated for the circuit load applied plus 25%.

13.18.2 All cab switches shall be heavy duty, high duty cycle, Cole-Hersee or equivalent.

13.18.3 All cab switches shall have four (4) inches, minimum, of slack on wiring leads.

13.19 Cab Door Open, Compartment Door Open, Air Bottle Compartment Open and Equipment Not Stowed Warning System shall be installed utilizing both visual and audible warning.

13.19.1 A Tomar MicroLED flashing light, amber in color, mounted on the roof of the cab between the driver and officer seats.

13.19.2 A continuous sounding audible alarm (buzzer) shall be furnished and installed in the cab.

A) Audible alarm shall have a silence feature so that the operator can temporarily turn the audible alarm off. The silence feature shall automatically cycle to the “on” (normal operation) when the battery master switched it turned off.

13.19.3 System shall alert the apparatus operator when, at a minimum any of the following conditions exist; cab door opened, compartment door opened, air bottle storage door opened, pump operators stand extended, scene lighting poles not retracted.

A) Other vehicle fixtures or equipment as determined at the pre-construction conference not properly closed or stowed.

13.19.4 System shall only go into alarm when the Maxi (parking) brake is released.

A) An alarm override virtual switch programmed into the V-Mux system shall silence the audible alarm and shut-off the flashing light. Alarm override will default to on when the battery switch is cycled.

13.20 Mounting for radio equipment shall be provided beneath the right front (officer’s) seat. Access to this compartment shall be gained through a side mounted lift up door. The compartment and the compartment door shall be as large as possible.

13.20.1 A three (3) stud buss bar wired to the vehicle electrical system shall be provided in the radio compartment to provide a 12 volt feed for two-way radio equipment.

A) The studs shall consist of a 12 volt, 40 amp direct to battery stud, 12 volt 40 amp stud, switched through the master disconnect switch, 12 volt 20 amp stud switched through the ignition switch.

13.20.2 A separate ground stud for the radio communications equipment shall be installed and grounded direct to the frame of vehicle using No. 6 AWG stranded copper cable, minimum.

13.20.3 All electrical studs shall be clearly and permanently labeled.

13.21 The main/master electrical disconnect switch shall be located at the driver's seating position and shall be easily reached by the apparatus operator while seated and belted.

13.21.1 The master disconnect shall be either: a high amperage Cole Hersee, or equal, rotating switch, or an electrical switch wired through a relay and a high amperage solenoid.

13.21.2 When the master disconnect switch is in the OFF position it shall terminate electrical power to all vehicle circuits, except those specifically designed to be always hot.

13.21.3 When the master disconnect switch is in the ON position all vehicle circuits, except the ignition/starter circuit(s) shall be hot.

13.21.4 The master disconnect switch must be ON in order for the ignition switch to receive power.

13.22 One (1) heavy duty ignition switch similar to the master switch, shall be furnished and installed adjacent to the master switch.

13.22.1 The ignition switch shall control power to ignition/starter circuits and will only be able to energize those circuits when both the master disconnect switch and ignition switch are in the ON position. If the master switch is ON and the ignition switch OFF the engine starter will not engage nor will the engine start if the start button is pressed.

13.22.2 The starter load shall NOT be wired through the master solenoid circuit.

13.22.3 All ignition wiring shall be wired on separate and dedicated circuits.

13.23 One (1) high duty cycle Cole Hersee, or equal, spring loaded, push button starter switch shall be furnished and installed adjacent to the master and ignition switches.

13.23.1 Starter switch shall be locking type or have a protective shoulder ring to prevent accidental engagement.

13.23.2 Starter switch shall be circuit limited to prevent the starter from engaging should the start switch be activated, and the engine is already running.

13.24 A minimum of the following controls, instruments and switches shall be furnished and installed within easy reach of, and in an unobstructed view of the driver while seated and belted. Dashboard instrument cluster backlit color: blue.

13.24.1 One (1) Electronic tachometer.

13.24.2 One (1) Electronic speedometer

13.24.3 One (1) Electronic engine oil pressure gauge.

13.24.4 One (1) Electronic engine coolant temperature gauge.

13.24.6 One (1) Electronic fuel level gauge.

13.24.7 One (1) Electronic transmission temperature gauge.

13.24.8 Two (2) Brake air pressure gauge(s), one dual gauge is acceptable.

13.24.9 One (1) Headlight switch with actuated instrument lamp rheostat.

A) High beams to be adjusted through steering column switch.

13.24.10 One (1) Windshield wiper/washer control switch. Switch will control the windshield wiper high and low speeds as well as the intermittent function. Windshield washer pump shall be controlled from the same switch.

13.25 Additionally the following controls, instruments and switches shall also be installed in the vehicle dashboard.

13.25.1 One (1) Hobbs Engine hour meter gauge wired through an oil pressure switch, to operate only when engine is running, may be part of multiplex system.

13.25.2 One (1) mechanical engine air filter restriction indicator.

13.25.3 Diesel Exhaust Fluid tank level indicator; gauge or LED light graph

13.25.4 Exhaust regeneration control and inhibit switches as specified by engine manufacturer, switches to be clearly labeled.

13.25.5 One (1) digital volt meter accurate to ± 0.1 volt, may be part of multiplex system.

13.25.6 One (1) digital ammeter, with shunt. Ammeter shall be accurate to ± 5%, may be part of multiplex system.

13.25.7 One (1) digital clock, 24 hour format, installed on the officer's side of the vehicle dash, easily viewed by the officer while seated and belted, may be part of multiplex system.

13.26 Green or Blue indicator lamps shall become illuminated to show the following conditions:

13.26.1 Battery on

13.26.2 Ignition on

13.26.3 Directional indicator lamps/four-way flashers on

13.26.4 High beam headlights on

13.27 Status lamps for the diesel exhaust system and regeneration function shall be furnished and installed as specified by the engine manufacturer.

13.28 Red warning light shall flash and an audible alarm sound in the cab for the following operating conditions:

13.28.1 Low air in the brake system, primary, secondary, or both.

13.28.2 Low engine oil pressure, high engine oil temperature.

13.28.3 High transmission temperature.

13.28.4 Low coolant level/coolant overheat.

13.28.5 Warning lights and alarms for items 13.28.2 – 13.28.4 shall be duplicated at the pump operator's panel.

13.29 All gauges shall be Stewart Warner, VDO or equivalent standard automotive gauges commercially available.

13.29.1 All dashboard gauges shall be backlit.

13.29.2 All dashboard instrumentation, gauges, and controls shall receive data from the SAE J-1939 data buss.

13.29.3 All dashboard instrumentation, gauges, and controls shall be clearly and permanently labeled.

13.30 An auxiliary starting (jumper cables), battery charging system, wired directly to the vehicle battery system, utilizing color coded, external battery posts located in the manufacturer's standard location.

13.31 Two (2) "Line Master", Model 632S floor switches, or equivalent shall be furnished and installed on the officer's side floor to control the Federal Q2B siren and vehicle air horn.

13.31.1 Floor switches shall be spaced so that they can be operated by personnel wearing fire turn-out boots without stepping on more than one switch at a time.

13.31.2 Air horn floor switch shall be located to the left of the siren floor switch.

13.31.3 Air horn switches shall activate a Skinner 7000 Series valve, to flow air to the horns.

13.31.4 Siren switch shall activate a continuous duty solenoid for the siren.

13.31.5 Switches shall be properly labeled.

13.32 A vehicle horn/air function (horn/air horn) switch shall be installed on the dashboard center console and programmed so when the air horn function is selected the air horns will sound when the horn control on the steering wheel is used.

13.32.1 When the “Emergency Master” switch is activated the horn function shall automatically switch from vehicle horn to air horn and revert back to vehicle horn when the “Emergency Master” is shut off.

13.33 Supply six (6), 12-volt power point for charging various handheld devices such as table computers, cell phone, etc. Two (2) 12-volt cigarette style plug-in power points with dust covers and Four (4) Kussmaul Model 091-219-5 USB Dual Port chargers, 5.2 volt DC, 2.4 amp output at each port. All power points to be wired battery direct.

13.33.1 Both cigarette light type power points and two (2) USB power point to be mounted on center dash.

13.33.2 Two (2) USB power points to be mounted on the engine doghouse, final locations to be determined.

13.34 Kussmaul Chief Series 40-amp charger Model # 4015, part number 091-266-12-40 with part # 091-266-RCP remote control/display panel furnished and installed. Battery charger shall monitor vehicle battery voltage and charge batteries as needed. Installation to be done according to Kussmaul Electronics recommendations.

13.34.1 Battery charger will have settings for multiple types of batteries, ie: flooded lead acid, absorbed glass mat, gel cell, and will self-regulate so as not to overcharge or boil out batteries.

13.34.2 System to have parasitic load compensation that will allow the battery charger to vary charge rates between the vehicle batteries and the total parasitic load, ie: rechargeable hand lights, cordless tool battery chargers, to optimize charging cycles as needed.

13.34.3 Remote Control/Display Panel part # 091-266-RCP mounted inside the left (curb) side cab crew window and functions as a display only.

A) Both the Main and Remote Control/Display Panels are to be password protected so that settings cannot be field changed.

13.34.4 Kussmaul battery filter # 019-137 shall be installed on the system.

13.34.5 One (1) Kussmaul Super Auto Eject 20 amp plug model # 091-55-20-120 shall be furnished and installed on the exterior of the apparatus body at the left rear corner, final mount location to be determined.

A) Kussmaul Super Auto Eject 20 amp plug cover to be red in color and is shared with the Kussmaul Air Compressor.

13.35 Two (2), two-way radio MATM antenna bases shall be furnished and installed each antenna base shall be fitted with a weatherproof rain cap.

13.35.1 One (1) antenna base on the cab roof, approximately 30" from center, centered above the right side rear cab door.

13.35.2 One (1) antenna base on the cab roof, approximately 30" from center, centered above the left side rear cab door.

13.35.3 Two (2) antenna wires shall be run to the compartment under the officer's seat.

13.36 Weather Alert and Civil Defense Warning Radio System

13.36.1 A Jensen or equal, automotive AM/FM stereo with a dedicated weather band shall be furnished and installed in the vehicle cab, overhead of the officer's seating position.

13.36.2 System shall be able to play pre-recorded messages in the MP3 format.

13.36.3 Four (4) poly-cone speakers shall be furnished and installed, one (1) in each corner of the cab.

13.36.4 Power to this unit shall be automatically terminated when the maxi (parking) brake is released.

13.37 Fire Research inView™ 360, with high definition and split screen viewing options, video system included and installed. System components at minimum include; four (4) four cameras, one (1) full color display screen, an Electronic Control Unit (ECU), required harnesses and a manual camera switch.

13.37.1 The system/cameras will be able to provide split video feed with bird's-eye view of the apparatus and individual camera views.

13.37.2 Cameras views shall automatically switch between bird's eye view and left, right, and rear views with the activation of the corresponding turn signal or reverse gear being selected and return to bird's view when turn signals cancel or the transmission is shifted out of reverse.

A) A manual override switch that allows the apparatus operator to override the default camera view and select any camera view shall be included.

13.37.3 Fire Research inView™ 360 will display on a screen in view of the driver while seated and belted. Final mounting location to be determined.

13.38 Dedicated 12-volt power circuit, wired battery direct for future use to power/charge a computer table furnished and installed on the dashboard at the officer's seating location. Final location to be determined.

13.39 Furnish and install a 1 ½" diameter, minimum, flexible, weatherproof conduit from the radio compartment under the officer's seat to the cab center dash to be used for radio interconnect cables.

13.39.1 Manufacturer will install two (2) pull lines in the conduit for future use.

14 Vehicle Lighting, Emergency Lighting, and 12-volt Scene Lighting

Proposed As:	
Spec.	Equal

14.1 All lighting required by applicable FMVSS, FMCSA, DOT, ICC, NFPA standards, state and local codes shall be furnished and installed according to component manufacturer recommendations.

14.2 All lighting shall be light emitting diode (LED) type unless otherwise specified. This shall include but not be limited to cab and body marker light, turn signals, stop and taillights, side marker lights, ground lighting, emergency lighting, traffic warning devices, etc.

14.3 Cab instrument panel, gauges, switches and components controls shall all be clearly and permanently labeled.

14.3.1 Instrument panel, gauges, switches and components controls shall all be backlit for easy nighttime viewing. Backlighting brightness shall be adjustable and controlled by a rheostat on the headlamp switch. Backlighting color: blue.

14.3.2 Function switches shall have a pilot light that illuminates when the switch is in the ON position.

14.4 Cab Ceiling Lights shall be four (4) Whelen model 70CREGCS, dual red/white LED fixtures shall be furnished and installed on the cab ceiling. Fixtures will be equipped with switches that allow them to be turned on and off by seat occupants.

14.4.1 One light fixture shall be positioned over each front seating position and two (2) fixtures in the crew area of the cab.

14.4.2 Cab red lighting shall come on automatically when cab doors are opened and shall shut off when doors are closed.

14.5 Three (3), additional Whelen model 70CREGCS dual red/white LED light fixtures shall be furnished and installed on the cab ceiling.

14.5.1 One (1) fixture cab center between the driver's and officer's seating locations. Two (2) installed in the crew are of the cab inboard.

14.5.2 Auxiliary cab lighting shall be wired to turn on and turn off with the door switches or fixture mounted switches.

14.6 Two (2) under cab, engine area work lights with switches, fully enclosed type lights with lens and guards.

14.7 Five (5) DOT, ICC compliant, amber marker lights shall be integral to the Fire Research brow light (See 14.27).

14.8 Seven (7) DOT, ICC compliant, red marker lights shall be furnished and installed on the rear of the vehicle.

14.8.1 Five (2) red marker lights installed rear facing, across the rear of the vehicle.

14.8.2 Two (2) maker lights shall be furnished and install on the side, at the rear corners of the vehicle. These may be a combination fixture that includes the outboard rear marker lights.

14.9 Two (2) DOT, ICC compliant, LED, combination side marker lights/mid-ship turn signal, steady burn, shall be furnished and installed, in the body lower rub rail, middle of the vehicle.

14.10 Britax side mounted, front and rear facing, rubber enclosed lights shall be furnished and installed.

14.10.1 Two (2) Model 427 marker lights, shall be installed one (1) each side on or as close to the rear corner of the apparatus as possible.

A) These shall be mounted so that they can be clearly seen by driver from side view mirrors.

B) Britax lights shall be angled down when mounted.

14.11 Rear vehicle lights, directional, stop/turn, reverse, and lower zone warning shall be mounted in polished cast aluminum four fixture bezels. One (1) bezel mounted on each side of the vehicle, outboard.

14.11.1 Two (2) Stop/Taillights shall be red Whelen 600 Series, Super LED, red, and be a combination tail light and brake light style. One (1) mounted on each side of the vehicle.

A) Stop light shall have a stutter flash when the brake pedal is depressed, and the light is first activated.

B) Stop/Taillights shall be one of four lights in the cast aluminum four (4) fixture bezel, they shall be the second light from the top.

14.11.2 Two (2) reverse lights shall be Whelen 600 Series, Super LED, clear (white), type. One (1) mounted on each side of the vehicle, third light from the top.

14.12 Four (4) Whelen 600 Series, Super LED, arrow shaped, amber, directional signal lights shall be furnished and installed.

14.12.1 Front directional signals shall be installed, one (1) on each side of the cab front face, mounted in a polished aluminum single light bezel, above the headlight housing.

14.12.2 Rear directional signal lights shall be installed in the cast aluminum four (4) fixture bezels, directional signal shall be the top light in the housing.

14.12.3 All front and rear directional signals shall be programmed to flash a progressive arrow pattern when activated.

14.13 Four (4) J.W. Speaker Model 8800 Evolution 2, DOT compliant, heated, LED headlights, with daytime running light feature, to be mounted on each side of the cab front, in chrome or stainless-steel bezels.

14.13.1 Two (2) headlights to be mounted on each side of the vehicle one (1) low beam and one (1) high beam. Headlights are to be mounted below the lower zone emergency warning lights.

14.13.2 Headlights and marker lights control by a rocker style switch located within easy reach of the driver while seated and belted. Switch backlit and clearly labeled.

A) Rocker switch assembly to included a dimmer switch for the cab dashboard and instrumentation lighting.

14.14 Four (4) NFPA compliant, automatic step lights shall be provided, one (1) at each cab entrance door to illuminate the cab steps. These lights shall turn on and off with the door opening and closing.

14.14.1 Four (4) Tecniq, model D04, Linear Dragon Lights, color: blue, mounted two (2) in the driver's side and two (2) in officer's side to illuminate the footwell area.

14.15 Four (4) NFPA compliant, Tecniq Model E-10 ground lights shall be provided and mounted, one (1) under each cab door to illuminate the area under/in front of each door.

14.16 Ten (10) NFPA compliant, Tecniq Model E-10, ground lights shall be provided and mounted.

14.16.1 One (1) under each the left and right side pump panels.

14.16.2 One (1) under each the L1 and R1 compartments.

14.16.3 One (1) under each the L3 and R3 compartments

14.16.4 Two (2) under the front bumper

14.17.5 Two (2) under the rear step.

14.17 Ground lighting detailed in 14.15 and 14.16 shall turn on with the maxi (parking) brake is set and turn off when the maxi brake is released, and with the open of respective cab door.

14.17.1 Turn on when the vehicle is placed in reverse, and off when the vehicle is taken out of reverse.

14.17.2 When the left or right turn signal is active (on) the corresponding side ground lights will turn on and shut off when the turn signal cancels.

14.17.3 With a virtual switch on the V-Mux Vista screen.

14.18 Eight NFPA compliant, LED, step lights as detailed, provided and mounted.

14.18.1 Six (6), 4" round step lights with polished stainless-steel bezels.

A) One (1) each side of the compartment body, forward facing, mounted approximately six inches (6") above the pump enclosure running boards.

B) Four (4) to illuminate the top of the apparatus, location and mounting to be determined.

14.18.2 Four (4), On Scene Solutions, 18” Access LED strip lights.

A) Two (2) with ball burnished aluminum housings furnished and installed under the middle step going to the pump operator’s walkway.

B) Two (2) with polished aluminum housings furnished and installed at the leading edge of the pump operator’s walkway.

14.19 Step lights shall be wired through the headlight switch and maxi (parking) brake valve. Step lighting shall turn on when the headlights are on and the maxi brake is set and turn off when the Maxi brake is released.

14.20 Five (5), On Scene Solutions, 18” Access LED strip lights with ball burnished aluminum housings furnished and installed in the hose bed.

14.20.1 One (1) centered up high on the forward bulkhead wall. Two (2) mounted on the left hosebed wall up high, one (1) at the rear and one (1) centered. Two (2) right hosebed wall up high, one (1) at the rear and one (1) centered.

14.20.2 Hose bed lights will turn on when the maxi (parking) brake is applied and shut-off when the maxi brake is released.

14.20.3 Programmed into the driver’s V-Mux screen an override virtual switch that will allow the apparatus operator to turn the hose bed lights on and off with the maxi brake released.

14.21 Two (2) TecNiq Inc. Model E61 dock lights shall be furnished and installed, mounted on the rear fender wells, one (1) each side facing toward the rear.

14.21.1 Lights to automatically turn on when the vehicle is placed in reverse, and off when the vehicle is taken out of reverse.

14.21.2 When either the left or right turn signal is active (on) the corresponding dock light shall turn on and shut off when the turn signal cancels.

14.22 Forward facing warning lights shall be furnished and installed as follows:

14.22.1 Cab roof shall have one (1), eighty-one inch (81”), Whelen Freedom IV series LED light bar furnished and installed on the cab roof, centered mounted, with roof mount brackets.

A) Light bar includes nine (9) Rotobeam LED rotators, two (2) white and seven (7) red. Two (2) long, white, Super-LED pods, two (2) long, red, Super-LED pods, and two (2) short, white, Supper-LED pods.

14.22.2 Two (2) red Whelen 600 Series, Super-LED heads, with single chrome bezels color: red with clear lenses mounted in the outboard positions of the factory uppermost double light head assemblies on the front of the vehicle below the windshield.

14.22.3 Two (2) red Whelen 600 Series, Super-LED heads, with single chrome bezels, color: blue with clear lenses, mounted in the inboard positions of the factory uppermost double light head assemblies on the front of the vehicle below the windshield.

14.23 Rear facing warning lights shall be furnished and installed as follows:

14.23.1 Two (2) Whelen Micro Freedom light bars with super-LED light heads, 0ne (1) color: red and one (1) color: blue, furnished and installed the rear of the apparatus body. Mounted one (1) each side as high on the body as possible.

A) Blue mounted on the left (street) side and red mounted on the right (curb) side.

14.23.2 Two (2) Whelen M9 Series, Super-LED light heads, with chrome bezels, one (1) color red and one (1) color blue, furnished and installed on the rear of the apparatus body. Mounted one (1) each side of the body, approximately mid-height.

A) Red mounted on the left (street) side and blue mounted on the right (curb) side.

14.23.3 Two (2) Whelen 600 Series, Super-LED heads, color amber, shall be mounted in the cast aluminum four fixture bezel, they shall be the bottom light.

14.23.4 Two (2) Whelen 600 Series, Super-LED heads, color red, in single chrome bezels to match the cast aluminum four fixture bezel, shall be mounted on the rear of the apparatus, final location to be determined.

14.24 Side facing warning lights shall be furnished and installed as follows:

14.24.1 Two (2) Whelen 600 Series, Super-LED heads, duo color: red/blue with clear lens, in single black bezels, recessed mounted, one (1) on each side of the front bumper extension skirting.

14.24.2 Four (4) Whelen 600 Series, Super-LED heads, in single chrome bezels, mounted:

A) One (1) on each side of the cab, color: red with clear lenses, mounted centered, above the front wheel wells.

B) One (1) on each side of the cab, color: blue with clear lenses, mounted centered above the crew cab windows.

14.24.3 Two (2) Whelen 600 Series, Super-LED heads, color: blue with clear lenses, in single chrome bezels, mounted one (1) on each side of the vehicle, centered low in pump panel.

A) The Whelen 600 Series lights mounted on the driver's and officer's side pump panels shall shut-off when the pump is engaged.

14.24.4 Four (4) Whelan 900 Series, Super-LED light heads, two (2) red with clear lenses and two (2) blue with clear lenses, in single chrome bezels provided on the sides of the apparatus body. Mounted two (2) each side as high on the body as possible, one (1) in top forward corner, one (1) in the top rear corner.

14.24.5 Two (2) Whelen 900 Series, Super-LED light heads, color: red with clear lenses, in single chrome bezels shall be installed on the sides of the cab at the top of “C” post.

14.24.6 Four (4) Whelen TIR-6 Super LED heads in chrome flange housings, color red, to be mounted four in the rub rails, two (2) each side body centered below the L1/R1 and L3/R3 compartments.

14.25 All forward facing white emergency lights shall be automatically shut-off when the maxi brake is engaged.

14.26 One (1) Whelen Model # TAL-65, 6 light LED, traffic advisor shall be furnished and recessed mounted on the rear of compartment body, centered.

14.26.1 Traffic advisor shall be wired through the “Emergency Master” switch so that it will only be powered when the Emergency Master switch is in the on position.

14.26.2 The outer red light traffic advisor shall activate when the maxi (parking) brake is set.

14.27 One (1) Fire Research Corp. model CLA100-A68, LED brow light with integral DOT approved marker lights shall be furnished and mounted on the bottom of the Whelen light bar, centered.

14.27.1 Brow light shall be switched on/off from the cab and from the pump operator’s panel, switches shall be clearly labeled. One (1) switch in each location shall turn the brown light on and off.

14.27.2 Cab switches shall be clearly labeled, back lit, and within reach of the Officer while seated and belted.

14.27.3 Pump panel switch shall be weatherproof and clearly labeled.

14.28 Six (6) Fire Research Spectra model SPA900-Q70 furnished and installed as follows:

14.28.1 Two (2) fixtures recessed mounted in the cab, top of the “B” post, one (1) each side.

A) Lights shall turn on with the opening of a cab door on the corresponding side and turn off when the door closes.

14.28.2 Two (2) fixtures recessed mounted in the compartment body approximately midship, one (1) each side.

14.28.3 Cab and body side mounted scene lights shall turn on and off by switches located in the cab and on the pump operator’s panel. One (1) switch at each

location for the left side lights and one (1) switch at each location for the right side lights.

A) Cab switches shall be clearly labeled, back lit, and within reach of the Officer while seated and belted.

B) Pump panel switch shall be weatherproof and clearly labeled.

14.28.4 Two (2) fixtures recessed mounted in the compartment body, rear as high on the body as possible, above the 900 Series warning lights, one (1) each side.

A) Lights shall be activated when the apparatus is placed in reverse and shut-off when shifted out of reverse.

B) Lights shall also be turned on and off from a switch located on the pump operator's panel. Pump panel switch shall be weatherproof and clearly labeled.

14.29 Each cab door equipped with one (1) Truck-Lite 4" round, grommet mount, LED light, color: amber, mounted in the lower outboard corner.

14.29.1 Each cab door, along the top edge, outboard, shall be fitted with a amber LED strip light, twelve inches (12") in length, minimum, lights shall flash in moving sequence starting at the inboard tip and moving outboard.

14.29.2 Cab door warning lights turn on the respective door is open and shuts off when the door is closed.

15 Sirens, Air Horns, and Back-up Alarm

Proposed As:	
Spec.	Equal

15.1 One (1) Federal Sign and Signal Model Q2B-P with chrome plated housing and polished pedestal shall be furnished and installed.

15.1.1 Q2B shall be mounted on the front bumper gravel shield, left side. Gravel shield shall have extra brackets, or reinforcement installed as needed to support the weight of the siren and the torque load without cracking or other damage.

15.1.2 Q2 shall have a siren brake. Siren brake activation shall be through switching detailed in Section 13.31.

15.1.3 Q2B shall be wired through the Emergency Master switch so the siren is only active when the Emergency Master is on.

15.2 A Federal Signal PA-4000 Siren Amplifier and Control Center shall be furnished and installed. Unit shall provide100/200 watt output, multiple function siren, and public address system and be wired through the Emergency Master switch so the siren is only active when the Emergency Master is on.

15.2.1 Siren Output shall be set at 200 watts.

15.2.2 Siren unit shall be mounted on the center section of the cab dash console so that it is with easy reach of the Officer while seated and belted, final mounting location to be determined.

15.2.3 One (1) Federal Signal model BP200-EF compact 200-watt speaker with a flat stainless grille, shall be provided and recess mounted in the front bumper, right side.

A) Siren speaker shall be set for a 200-watt output.

15.2.4 Federal Rumbler intersection clearing system shall be integrated into the PA-4000 siren control.

15.3 Two (2) Hadley E-Tone Model H09321AC, 21” minimum length, air horns furnished and installed in the front bumper. Final mounting location to be determined.

15.3.1 Air horn activation shall be through switching detailed in Section 13.31

15.3.2 An overhead lanyard to activate the air horns shall be furnished and installed on the Officer’s side, only.

15.4 An Ecco # SA914, or equivalent, back-up alarm shall be furnished and installed in the rear of the apparatus. Alarm will sound whenever the vehicle is placed in reverse and will continue to sound as long as the vehicle is in reverse.

15.4.1 The back-up unit shall have solid state electronics, and have automatic volume control between 87-112 db. That automatic adjusts alarm volume based on ambient noise levels.

15.4.2 The back-up alarm shall be able to withstand vibration, moisture, steam cleaning, pressure washing, and operations in severe weather conditions and be properly mounted, at rear of body.

16 Pump Enclosure, Pump Panels, Fire Pump, and Plumbing

Proposed As:	
Spec.	Equal

16.1 The fire pump enclosure shall be a free standing module, located directly behind the apparatus cab, attached and supported at the chassis frame rails. This module will allow independent flexing of the pump enclosure from the compartment body. Support structure shall fabricated from a weldment of tubing and angled metal and be bolted in place.

16.1.1 The pump enclosure, and its support structure shall be 6061-T6 aluminum extrusions, tubing and angle metal in design and construction.

A) The pump enclosure and finish skin shall be fabricated from 5052-H32 marine grade aluminum sheet 3/16” thick, minimum.

B) Extruded stainless-steel framing and stainless-steel sheet metal overlay construction may be substituted for aluminum.

C) The width of the pump enclosure shall not exceed 64”

16.1.2 The pump enclosure shall be designed for a top mounted pump operator’s panel with the sides of the pump enclosure following the contour of the top pump panel.

A) A full width walkway in front of the pump operator’s panel with a maximum width of twenty-four inches (24”) and be illuminated. Right (curb) side of the walkway stairs built as a tool compartment with the stairs lifting for access. Latch for stairs flush type, stairs held open by a single gas compressed shock absorber swing check.

B) Compartment lit by one (1) On Scene Solutions 9” Access LED strip light in a ball burnished aluminum housing.

C) Two (2) Hansen 4000 LED lighted series Anti Slip Rail, NFPA compliant, slip resistant grab handles, 30” in length, minimum, shall be furnished and installed, one (1) at each end of the pump panel walkway, color: white.

D) Two (2) Hansen 4000 LED lighted series Anti Slip Rail, NFPA compliant, slip resistant grab handles, 36” in length, minimum, shall be furnished and installed, one (1) at each end of the pump panel walkway, color: white.

16.1.3 Two (2) full width speedlay hose storage areas shall be provided below the pump operator’s panel each with a capacity as detailed below.

A) Each speedlay section, both right and left sides, shall be equipped with three (3) stainless guide rollers, one (1) each side of the opening and one (1) along the bottom to aid in the deployment of fire hose.

B) Each speedlay section shall have a removable hose tray that will be sized to hold the specified hose load and nozzle. Two (2) of each hose load trays shall be provided with the apparatus.

C) Top speedlay 200 feet (200’) of 1 ¾” double jacketed fire hose in 50-foot lengths with couplings and a pistol grip firefighting nozzle.

D) Bottom speedlay 200 feet (200') of 1 ¾" double jacketed fire hose in 50-foot lengths with couplings and a pistol grip firefighting nozzle.

E) All speedlays shall have NFPA compliant hose covers, fabricated from nylon webbing, color: black, held in place with a shock cord and hook system. Fastening done with Velcro or snaps is not acceptable. Hose covers to be fastened at each corner to hooks so that the covers are completely removable. Hose covers to be fabricated and supplied by D&S Custom Covers, Inc. of Rockwood, PA.

16.1.4 The top of the pump enclosure shall be adequately braced to support the weight of two (2) firefighters in full turn out gear accessing the top mounted deck gun.

A) There shall be a mount flange and/or plumbing support installed as needed to support the mounting of a deck and the be able to support the gun during use, flowing the maximum rated capacity at any angle.

16.1.5 The front face or the pump enclosure below the top control panel shall have a wide, 18" minimum, folding step to access the top mounted deck gun. Step shall have a minimum weight rating of 250 pounds.

16.2 Full width running boards shall be furnished and installed on each side of the pump enclosure.

16.2.1 The running boards shall be in accordance with NFPA 1901 in both step height and stepping surface. The maximum step height from ground to each running board shall not exceed 24".

16.3 Top mounted pump panel shall be constructed of type 5052-H32 marine grade smooth aluminum sheet stock a minimum of 3/16" thick and finished with a spray applied thermo-plastic coating, lightly textured for easy of cleaning, color: black.

16.3.1 Left and right side pump panels shall be constructed of type 5052-H32 marine grade smooth aluminum sheet stock a minimum of 3/16" thick and finished with a spray applied thermo-plastic coating, lightly textured for ease of cleaning, color: black.

16.3.2 The pump panels/instrument panels shall have a stainless-steel continuous hinges and shall swing open for easy access to the instruments, gauges, valves, linkages and the fire pump.

A) All hinged pump access panel shall be equipped with gas compressed, shock absorber style swing checks. Swing checks to be mounted so that access panels open a minimum of 90º.

16.3.3 Pump gauges and electrical controls shall be wired or plumbed with slack to allow the pump panel to swing open completely.

16.3.4 The pump panels that cannot be hinged shall be removable to provide complete access to the fire pump. Pump panels shall be secured with spring

loaded thumb latches, ¼ turn quick release fasteners, or ¼" stainless steel hex head bolts with caged nuts and lock washers, or equal.

16.3.5 All gauges, instruments, fire pump controls and gates shall be readily accessible for servicing.

16.3.6 The left and right side pump panels fabricated with a full width, intermediate, NFPA compliant slip resistant aluminum treadplate step with integral grab rail.

16.4 All controls, instruments, gates and gauges shall be clearly labeled with permanent engraved, cast or molded signage and identified with a color coding system.

16.4.1 Engraved color coded pump panel labels shall be installed on all pump panel equipment, valves, gauges, intake and discharge plumbing. Color coding systems shall include color coded bezels on all gauges and manufacturer's standard on all valve handles.

16.4.2 Color code detail will be provided by the Fire District prior to installation.

16.4.3 All valves, their corresponding gauge and intake or discharge outlet shall be provided with color coded garnish rings. This shall apply throughout the vehicle.

A) All flowmeters and pressure gauges to follow the approved color code.

16.5 Pump panels shall be adequately illuminated using six (6) On Scene Solutions Access LED strips. Pump panel lights shall turn on when the maxi (parking) brake is applied and turn off when the maxi brake is released.

16.5.1 Two (2), 48" On Scene Solutions Access LED strip lights with brushed stainless protective covers shall be mounted on each left side and right side pump panel.

16.5.2 Two (2) 36" On Scene Solutions Access LED strip lights with brushed stainless protective covers shall be mounted on top mounted pump panel.

16.6 Operational controls for all discharge valves, the tank to pump valve and the tank fill valve, pump governor and the rear, left and right side suctions shall be mounted on the top side pump operator's control panel.

16.6.1 Detailed design and layout drawings; ANSI Engineering Drawing size "D", 22" x 34", or larger of the top mounted pump panel and both the right and left side pump panels shall be submitted to Fire District for review and approval prior to construction.

16.7 All suction and pressure gauges shall be liquid filled, back lit, color: blue, Thuemling (Span), or equal with color coded or polished stainless steel trim bezels as required.

16.7.1 One (1) compound suction gauge, 4 ½" face, to read 30" of mercury to 400 psi. (30"-0-400)

16.7.2 One (1) compound pressure gauge, 4 ½" face, to read 30" of mercury to 600 psi. (30"-0-600)

16.7.3 All discharges unless otherwise specified shall have backlit, 3 ½" gauges that read 0 to 400 PSI scale. Back lighting color: blue unless otherwise specified. be determined.

16.8 All valve handle cut outs, intake and discharge gates and piping cut out shall have metal bezels. Bezels shall be polished or color coded as part of the color coding system.

16.8.1 All pump panel trim rings, bezels, labels, and signage shall be held in place with mechanical fasteners, isolation materials used as needed.

16.9 The pump panel shall also include but not be limited to the following controls:

16.9.1 Hobbs hour meter to activate only when pump is engaged, may be a function of the Pump Boss governor.

16.9.2 Pump engagement LED indicator light, per NFPA standards.

16.9.3 Priming pump control.

16.9.4 Auxiliary cooling control.

16.9.5 Push button control for vehicle air horns, color red.

16.9.6 Speed counter for fire pump.

16.9.7 Dedicated fuel gauge and DEF level indicator gauge. Fuel indicator in the pump governor does NOT satisfy this requirement.

16.10 Test taps for pump suction and pump pressure shall be provided and properly labeled.

16.11 The fire pump shall be driven through a Hale Products "G" Gearbox rated for 16,000 pounds of torque. The gearbox shall be Hale Products latest design and be manufactured to Hale Products current standards for gearboxes.

16.11.1 Gear box shall be of split shaft design so that it is not possible to be in "road" and "pump" at the same time.

16.11.2 The correct gear ratio shall be furnished to assure the fire pump will meet its rated capacity.

16.11.3 The gearbox shall be assembled and tested at the pump manufacturer's factory.

16.11.4 The fire pump and gearbox assembly shall be mounted as low as possible on the vehicle chassis.

A) Mounting of the pump assembly and gearbox shall be done in accordance with Hale Products standards and guidelines. Proper driveline angles shall be maintained.

16.11.5 The pump transmission cooler shall be plumbed from the discharge side of the fire pump, through the pump transmission, back to the intake side of the pump.

A) Water flow through this plumbing loop shall be valve controlled, valve to be mounted on the pump operator's control panel and be properly labeled.

16.12 Standard Hale Products pneumatic pump shift shall be furnished and installed on the engine doghouse, within easy reach of the vehicle driver.

16.12.1 The pump shift shall be a three-position control. UP shall be road gear, CENTER shall be neutral, and DOWN shall be pump gear.

16.12.2 There shall be three green indicator lights installed with this control. One (1) Pump Engaged light on the dashboard next to the control, one (1) OK to Pump light on the dashboard next to the control, and one (1) OK to Pump light installed on the pump panel.

A) Pump Engaged light shall indicate the pump transmission has shifted from road to pump.

B) OK to Pump lights shall indicate automatic transmission 4th gear lock-up.

16.12.3 Pump shifting shall be achieved by an air pressure actuated shift module mounted directly on the pump transmission.

A) The air pressure actuator shall be designed and manufactured by the pump manufacturer and shall be provide for positive locking in the road, neutral, and pump position.

16.12.4 Pump shift instruction signage shall be installed in the cab on the engine doghouse next to the automatic transmission touch pad. Instructions shall be easy to read and clearly visible to the driver.

16.13. Fire pump shall be a Hale Products Q-Max 200 Single Stage Centrifugal Fire Pump rated to deliver 2000 gallons per minute (GPM).

16.13.1 Rating shall be achieved by following the pump testing guidelines in NFPA 1901, pumping for rating and testing must be done from draft and be in U.S. gallons.

16.13.2 The pump shall be Hale Products latest design and be manufactured to Hale Products current standards for fire pumps.

16.13.3 The pump shall be equipped with, or have the following features:

A) Auto Lube™ to assure proper lubrication of the pump main shaft bearing.

B) A mechanical shaft seal, at the pump transmission end of the pump shaft.

16.13.4 Pump shall be readily accessible for examination, removal or repair. Pump placement in the chassis shall allow for maintenance and repair of both ends of the pump. Clearance plates shall remain attached.

16.13.5 Pump shall be equipped with a Hale Master Drain valve. Master Drain control shall be mounted on the left side pump panel.

16.13.6 The pump shall be equipped with Hale Products Thermal Relief Valve, electric version, TRV-L equipped with both a visual and audible warning of pump overheat condition.

A) The TRV-L shall be installed in the pump housing next the impeller chamber.

B) The TRV-L warning light, audible horn, and test switch shall be mounted on the Pump Operators panel, in plain view, and clearly labeled.

C) The TRV-L discharge tube shall be piped to the left side of the vehicle and discharge at the pump operators' feet.

16.14 The pump shall be fitted with four (4) zinc anodes to help prevent damage due to galvanic corrosion.

16.14.1 Two (2) anodes to be mounted in the suction side of the pump and two (2) anodes mounted in the discharge manifold.

16.14.2 Anodes painted yellow for visibility and ease of locating.

16.15 The pump shall be equipped with a Trident Model #31.011.0, three (3) barrel, automatic, multi-location, air operated priming system, all brass and stainless-steel construction. Primer suction tube shall be located above the pump impeller for drain back purposes and the inlet side of the primer equipped with a stainless-steel strainer.

16.15.1 Primer to be activated by a three-way switch mounted on pump operator's panel. Operation shall include and automatic mode.

A) Primer shall be equipped with a vacuum gauge.

16.15.2 Primer System shall be installed with tubing rated to 30 HG vacuum.

16.15.3 Primer discharge shall be piped below the chassis rail.

16.16 Task Force Tips stainless steel intake relief valve shall be furnished and installed on the intake side of the pump. Valve relief pressure setting shall be field adjustable.

16.16.1 Valve discharge shall be located and directed away from the pump operator's position.

16.16.2 Valve discharge shall be piped below the chassis rails and terminate with a 2 ½" NST adapter.

16.17 The apparatus shall be equipped with an electronic pressure governor system provided by Fire Research Corp. Pressure governor shall be constructed to the current standards of Fire Research and installed according to their recommendations and guidelines. The system shall meet or exceed all applicable provisions of N.F.P.A. 1901.

1617.1 Governor shall be model PBA401-D00 Pump Boss 400 compatible with the diesel engine installed in this vehicle and mounted on the pump operator's panel.

16.17.2 Pressure governor shall have a turn knob for throttle adjustment and shall have a cavitation shut down (automatic idle) feature.

16.17.3 Pressure governor shall be designed to default to P.S.I. mode

16.17.4 Pressure governor wiring harness to be continuous with no butt connectors.

16.17.5 Pump Boss 400 governor shall monitor the engine operating temperature, engine oil pressure and battery system voltage.

A) Visual and audible warning shall be given for any out-of-range engine operating condition.

16.18 The fire pump plumbing system shall utilize stainless steel pipe and fittings or high pressure flexible hose with a -30 HG vacuum and 1200 psi. burst pressure ratings. Piping shall be sized to provide rated water flow to required discharge outlets with a minimum of friction loss. Any manifold, intake or discharge, shall be fixture built and attached to pump system with flanged or Victaulic couplings.

16.18.1 All piping layouts shall be designed and installed to minimize friction loss, bends and restrictions.

16.18.2 All piping shall be designed and installed to eliminate water and/or air traps and to facilitate maintenance, servicing, and repair.

16.18.3 All removable pipe joints and fittings shall be coated with an anti-seizing compound.

16.18.4 Intake and discharge piping to front and/or the rear of the apparatus shall be installed using Victaulic connections and secured to frame or body.

16.18.5 All intake and discharge piping shall terminate with National Standard Thread (NST) fittings or adapters as needed.

16.19 All intake and discharge valves shall be Akron 8800/8600 series, Generation II, full flow, utilizing two seat design unless otherwise specified.

16.19.1 Valves shall close tightly to prevent water or air leaks, or air traps.

16.19.2 All 3" and larger valves to be electrically actuated, unless otherwise specified.

16.19.3 All 2 ½" and smaller valves shall be controlled by Innovative Controls locking "T" handle push/pull actuators.

16.20 All intakes, except tank to pump, shall be equipped with strainers made from zinc or other sacrificial alloy. All fire pump suction strainers shall be secured by suction adapters, and easily replaced.

16.20.1 There shall be two (2) 6” side intakes, one (1) one each side of the fire pump both intakes shall have short steamer connection barrels.

A) Right side intake shall be controlled by a Hale Products 5“ Master Intake Valve (MIV), electrically actuated valve with an air bleeder. Valve controls to be located on both the right and top side the pump operators panel.

B) Left side intake shall be controlled by a Hale Products 5“ Master Intake Valve (MIV), electrically actuated valve with an air bleeder. Valve controls to be located on both the left and top side the pump operator’s panel.

C) Manual overrides for MIV valves shall be located on the corresponding side pump panel and clearly labeled.

D) Both 5” intakes terminate in a Harrington 6” NST short handle swivel by 5” Storz fitting on a 30º downward angle with plug and chain.

16.20.3 There shall be two (2), 2 ½” auxiliary suctions one (1) on the left side pump panel in the rearward position, and one (1) on the right side pump panel, located in the forward position.

A) Both auxiliary suction valves shall be Akron Brass 8800 Series with a TS control handle, valves shall be self-locking, and mounted behind the pump panel.

B) Auxiliary suctions shall terminate with 2 ½” female, NST aluminum swivel adapter, with a self-venting plug and safety chain, chrome plated, Red Head or equivalent.

16.20.2 There shall be a 3” tank to pump valve furnished and installed. Tank to pump valve shall be controlled by an Innovative Controls locking “T” handle push/pull actuators. Valve control to be located on top pump operator’s panel.

A) Tank to pump system shall have a check valve installed so that water cannot flow back into the booster tank. Check Valve to be made of brass or stainless steel.

B) There shall be a full flow strainer installed between the pump and the tank.

16.20.3 All intakes, except tank to pump, shall be equipped with strainers made from die cast zinc or other sacrificial metal. All fire pump suction strainers shall be secured by, retaining clips, or suction adapters, or fitting washers and easily replaced.

16.20.4 All intakes, except tank to pump, shall be equipped with Innovative Controls lift to open drain valves. Suction drains shall drain the outboard side (hose side) of the valve.

A) All intake drains are to be clearly and permanently labeled with engraved, color coded signage.

B) All intakes drains plumbed to discharge below the chassis rails.

16.21 Fire pump discharges shall be furnished and installed as specified.

16.21.1 There shall be one (1) 4” discharge on the right (curb) side pump panel. Piping shall be 4” formed stainless steel pipe and fittings with Victaulic breakaway couplings and be piped from the pump discharge manifold.

A) The right side 4” discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

B) Discharge piping shall terminate with a Harrington 4” NST rocker lug swivel X 5” Storz fitting on a 30º downward angle, with a with 2 ½” NST male adapter with self-venting cap and safety chain.

16.21.2 There shall be one (1) discharge on the right (curb) side pump panel, using a 3” valve and 3” piping to assure maximum water flow.

A) The 3” right side discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

B) Discharge piping shall terminate with an aluminum NST adapter 3” female swivel by 2 ½” NST male, on a 30º downward angle. A 2 ½” NST to 1 ½” NST adapter with cap and secure chain shall be included. All parts are to be chrome plated, Red Head or equivalent.

16.21.3 There shall be one (1) rear discharge, piping shall be 4” diameter formed stainless pipe and fittings with Victaulic breakaway couplings and be piped directly from a large diameter discharge port.

A) The rear discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

B) Discharge piping shall terminate with a Harrington 4” NST rocker lug swivel X 5” Storz fitting on a 30º downward angle, with a with 2 ½” NST male adapter with self-venting cap and safety chain.

16.21.4 There shall be one (1) 4” discharge on the left (street) side pump panel. Piping shall be 4” formed stainless steel pipe and fittings with Victaulic breakaway couplings and be piped from the pump discharge manifold.

A) The left side 4” discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

B) Discharge piping shall terminate with a Harrington 4” NST rocker lug swivel X 5” Storz fitting on a 30º downward angle, with a with 2 ½” NST male adapter with self-venting cap and safety chain.

16.21.5 There shall be one (1) discharge on the left side pump panel, using a 3” valve and 3” piping to assure maximum water flow.

A) The 3” left side discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

B) Discharge piping shall terminate with an aluminum NST adapter 3” female swivel by 2 ½” NST male, on a 30º downward angle. A 2 ½” NST to 1 ½” NST adapter with cap and secure chain shall be included. All parts are to be chrome plated, Red Head or equivalent.

16.21.6 There shall be two (2) 2” discharges plumbed to the speedlays, one (1) to the top speedlay and one (1) to the middle speedlay using 2” valves and 2” piping to assure maximum water flow.

A) Discharges shall be controlled by Innovative Controls locking “T” handle push/pull actuators. Valve control to be located on top pump operator’s panel.

B) Discharge pipe for each of the pre-connected 1 ¾” fire hose speedlay shall terminate 2” x 1 ½” national standard thread Chiksan brass swivel.

16.21.7 There shall be one (1) 2 ½” discharge plumbed to the rear of the hose bed, right (street) side, using 2 ½” valves and 2 ½” piping to assure maximum water flow.

A) Discharges shall be controlled by Innovative Controls locking “T” handle push/pull actuator. Valve control to be located on top pump operator’s panel.

B) Discharge pipe for the 2 ½” pre-connected fire hose speedlay shall terminate 2 ½” national standard thread chrome adapter.

16.21.8 There shall be one (1) 2 ½” discharge plumbed to the front bumper, left (street) side, using 2 ½” valves and 2 ½” piping to assure maximum water flow.

A) Discharges shall be controlled by Innovative Controls locking “T” handle push/pull actuators. Valve control to be located on top pump operator’s panel.

B) Discharge shall terminate 2 ½” national standard thread Chiksan chrome plated, surface mount, brass swivel, mounted on the gravel shield.

C) Front bumper discharge equipped with auto-drain(s) as needed so that any low areas in the piping complete drain of water.

16.21.9 There shall be one (1) 4” minimum, discharge piped and mounted on the top of the pump panel enclosure to provide a direct connection to the fire pump to supply a Deck Monitor Master Stream device.

A) Piping shall be 4” minimum, formed stainless steel pipe and fittings with Victaulic breakaway couplings or flange mounted directly to the fire pump.

B) The 4” top discharge shall be controlled by an Akron model 9335 Navigator Pro Valve Controller with pressure and flow readouts. Valve control to be located on top pump operator’s panel.

C) Piping shall terminate in compliance with deck gun manufacturer’s recommendations and/or requirements.

D) Piping shall be adequately braced to with nozzle reactionary forces in 360º rotation at full rated flow for extended periods of time.

16.21.10 There shall be one (1) 2” discharge plumbed to the booster (water) tank.

A) Discharge shall be controlled by Innovative Controls locking “T” handle push/pull actuator, or equal. Valve control shall be located on top mount pump panel.

B) Discharge plumbed to the booster tank is a “Tank Fill Valve” and will allow filling of the booster tank directly from the fire pump.

16.21.11 All discharges, except the “tank fill” and the booster reel shall be equipped with Innovative Controls lift to open drain valves. Discharge drains shall drain the outboard side (hose side) of the valve.

A) All discharge drains are to be clearly and permanently labeled with engraved, color coded signage.

B) All discharge drains plumbed to discharge below the chassis rails.

16.22 There shall be one (1) 2” discharge plumbed to the rear of the apparatus for the booster reel using 2” valves and 2” piping to assure maximum water flow. Discharge shall be controlled by Innovative Controls locking “T” handle push/pull actuators. Valve control to be located on top pump operator’s panel.

16.22.1 One (1) Hannay booster reel with 12-volt electric rewind shall be furnished and installed on the apparatus. Booster reel to be mounted in the rear of the compartment body, centered. Booster reel standard Hannay finish.

16.22.2 Booster reel shall have the capacity for 200 hundred feet (200’) of one inch (1”) red rubber booster hose.

A) Booster reel to be equipped with a stainless steel 4-way roller fairlead guide assembly to assist in hose deployment and rewind.

16.22.3 Two hundred feet (200’) of one-inch (1”) internal diameter, red rubber, two-ply, minimum, reinforced, in fifty foot (50’) lengths, and a minimum service test pressure of 800 psi shall be furnished and installed on the booster reel.

A) Style BW-A Barway hose couplings shall be used on the booster reel hose and two (2) Barway hose spanners shall be furnished and delivered with the apparatus.

16.22.4 Akron Brass Turbojet model 1704, 1” nozzle, with pistol grip, color: red, shall be furnished and installed.

A) Mounting for nozzle shall be furnished and installed on rear of the compartment body, final location to be determined.

16.22.5 Electric rewind controls for the booster reel shall be furnished and installed on the rear of the compartment body, final location to be determined.

17 Booster Tank, Foam Tank and Tank Level Devices

Proposed As:	
Spec.	Equal

17.1 The booster tank shall be a poly-propylene, combination type for both water and one (1) type of foam concentrate, manufactured by Pro Poly of America Inc. or equivalent. Water tank designed and constructed to conform to applicable sections of NFPA 1901.

17.1.1 The tank assembly shall carry a lifetime warranty for both parts and labor to the original purchaser.

17.2 Tank mounting and tank cradle will be the responsibility of the apparatus manufacturer to properly engineer and mount the tank assembly as per the tank manufacturer's requirements. This is to ensure that the lifetime warranty on the water tank will be valid.

17.3 Tank shall be mounted as low in the chassis frame as possible to keep the center of gravity of the vehicle, hose beds, and compartmentation as low as possible.

17.4 A booster tank water capacity shall be a minimum capacity of 1000 gallons, U.S. and be vented with 1", minimum, PVC vent.

17.4.1 Tank baffles shall be installed in tank to reduce water surge inside of tank, both fore and aft and side to side.

17.4.2 Provide top mounted, color coded: blue, water fill and overflow, minimum 8" square, with hinge-type cap.

17.4.3 Tank water fill tower to be equipped with a removable strainer.

17.4.4 Water tank overflow shall have a high flow rate and be designed to prevent overflow conditions from taking place on a steep grade. Overflow shall dump on the ground behind the rear wheels.

A) To make sure the tank overflow does not dump water on top of the rear axle breather vent, water is to dump on the opposite side of the vehicle as rear axle breather vent.

B) Design, construct, and install the overflow discharge pipe so that it is placed well behind and below the rear axle.

17.4.5 Construct the drainpipe out of a flexible material that can be easily accessed for repair or replacement without removing fuel tank or other components.

17.4.6 There shall be a 3" threaded discharge port for the tank to pump valve and plumbing.

17.4.7 Provide a tank drain and collection sump at tank bottom. Connect a 1 ½" 7600 series Akron valve with male NST hose connection to the drain sump, connection shall be capped. Tank shall be manufactured so that sediment drains to sump.

17.5 Booster (water) tank shall be equipped with Fire Research Tankvision tank level monitoring device and LED display to monitor and give the pump operator visual indication of the water in the booster tank.

17.5.1 Tankvision display shall be color coded: blue, clearly labeled and mounted on the pump operator's panel.

17.5.2 The Tankvision display shall flash when the tank level goes below ¼ (25%) of capacity.

17.5.3 Tankvision system will be equipped with the remote large light driver or drivers to control the indicator lights described in 17.6.

17.6 Two (2) Fire Research MaxVision, multi-color LED, color coded, to indicate booster tank water level in quarter tank increments, shall be furnished and installed. Indicators shall be mounted high in the cab "C" posts as possible, one (1) set each side.

17.6.1 Lighting color shall function as follows:

A) Green, fixture fully lit, booster tank full.

B) Blue, fixture ¾ lit, booster tank between ¾ & ½ full.

C) Yellow, fixrue ½ lit, booster tank between ½ & ¼ full.

D) Red, fixture ¼ lit and flashing, booster tank less than ¼ full.

18 Compartment Body

Proposed As:	
Spec.	Equal

18.1 The compartment body shall be aluminum in design and construction. The body sub-structure shall be constructed of 6061-T6 aluminum alloy, heavy duty tubing, angle, or channel, with manufacturer's standard features.

18.1.1 Compartment body supports and/or compartment floor supports shall be bolted under compartment floors.

18.1.2 Compartment body exterior (skin) shall be 1/8", minimum, 5052-H32 marine grade aluminum.

18.1.3 Vertical surfaces on the rear of the compartment body, exterior shall be smooth finish so they will accept reflective decals.

18.1.4 The compartment floors shall be a minimum of 3/16" 5052-H32 marine grade aluminum.

18.1.5 Body compartments shall be designed and fabricated to carry tools and equipment typical to the fire service. Given the severe duty of fire apparatus and the need to protect the tools and equipment the body compartments shall be designed to carry the following loads and employ 1.5 to1 overload factor. Engineering certification of the compartment loading capacities shall be provided, if requested.

A) Each full height body side compartment shall be designed and fabricated to hold a 750 pound (750 lbs.) load.

B) Each lower height body compartment shall be designed and fabricated to hold a three hundred fifty pound (350 lbs.) load.

C) Each over the wheel body compartment shall be designed and fabricated to hold a two hundred and fifty pound (250 lbs.) load.

D) Each roof top (coffin compartment) shall be designed and fabricated to hold a four hundred pound (400 lbs.) load.

18.1.6 Compartment body shall be designed and constructed to be flat across the rear of the body.

18.1.7 Compartment body shall be designed and constructed to maintain a common height with the apparatus cab roof.

18.2 Stainless steel framing and skin construction may be substituted for aluminum.

18.3 The front portion of the right and left hand side compartments shall mount to a front cross panel, constructed of similar methods and materials as the rest of the compartment body.

18.3.1 Cross panel shall bolt to the chassis frame.

18.4 The apparatus body shall be adequately secured to the chassis frame rails using body mounts designed minimized vibration transmitted through the compartment body from

the chassis, and allow for the proper amount of flex in the body, reducing stress and metal fatigue on the compartment body.

18.4.1 Body mounting system/bolts shall be accessible for visual inspection, re-torque, or replacement. Mounting shall incorporate bolts easily accessible from underneath or access provided through the body, or substructure.

18.5 Single axle wheel well compartments shall be integral with the compartment body and braced as needed to support any fender well storage compartment or feature.

18.5.1 Wheel well design shall allow for the removal of the rear axle tires and wheels without the need to remove any body panels.

18.5.2 Polished stainless steel fenderettes shall be installed in the single axle wheel openings. Fender shall be sufficiently wide to completely cover the outside of the tires and reduce wheel splash along the sides of the body.

A) A full width rubber welt shall be placed between the fenderette and body mounting surfaces. Outside edge of welting shall form a bead between the fenderettes and body, prevent moisture from entering into the seam between the fenderette and body, inside edge shall have a small, raised bead.

B) A liberal coating of Tectyl®, Eck® or equivalent, non-hardening rust proof/isolation coating shall be applied to fenderette and wheel opening flange during the assembly process.

C) Outside edge of fenderettes, at the wheel opening, shall be rolled inward or filed and polished to eliminate any sharp edges and avoid personnel injury or damage to equipment when cleaning apparatus.

18.5.3 Full semi-circular aluminum inner liners shall be provided in each wheel housing, liners shall be bolted in place, so they may be removed if damaged. Self-tapping sheet metal screws, or rivets are NOT acceptable.

18.6 All compartment body seams shall be caulked with one part polyurethane caulk Sikaflex # 221, 3M # 540, adhesive/sealant, or equivalent.

18.7 All exposed screw or bolt threads shall be capped with acorn nuts, nylon locking type used whenever possible.

18.8 All body overlay panels or components that are of a different metal than the body shall be properly isolated to reduce electrolysis and corrosion problems.

18.8.1 Body components covered with aluminum tread plate, all body overlay panels or components shall be coated with of Tectyl®, Eck® or equivalent, non-hardening rustproof/isolation coating prior to installation.

18.8.2 Bolt on body accessories, or fixtures, including but not limited to; door handles, grab rails, steps, and lights shall be isolated with Mylar, gasket material or other approved mechanical isolation methods.

18.9 The top of the left and right side body compartments shall be overlaid with slip resistant aluminum diamond plate. The cover shall not form the compartment top but shall be an overlay.

18.9.1 Side edges of cover shall have a 30-degree outward bend to provide drip edge. The front and rear edges of the overlays shall be rolled over 1”, flat and the corners welded.

18.10 The forward surfaces of the L1 and R1 compartment body shall be overlaid with polished aluminum diamond plate, full width and full height.

18.11 There shall be no sharp, edges, cuts, or corners capable of causing injury to personnel or equipment during operation or maintenance. All cut metal edges shall be ground, filed, sanded, or finished with a radius to ensure smooth edges.

18.12 Compartments shall be the "sweep out" design with the floor higher than the doorsill.

18.13 All compartments shall have a stainless doorsill that is formed with 90° angle to overlay onto the outside edge of the compartment body.

18.14 All compartments shall be furnished with metal louvers to provide adequate ventilation of each compartment. Ventilation louvers shall be in the wall (side or back) of the compartment.

18.14.1 Ventilation lovers shall be designed and positioned to allow free air flow between the compartment interior and atmosphere but not infiltration of water or road splash.

18.14.2 Ventilation louvers shall have a replaceable filter to limit the infiltration of road dust and dirt.

18.14.3 In no case shall louvers be located in the door, unless specifically called for.

18.15 All body side compartments shall have a minimum of four (4) Unistrut or equivalent, full height, tracks installed for mounting of the adjustable trays and shelves.

18.15.1 Shelves or trays are to be mounted using four (4) Cast Products 2” x 2” cast aluminum shelf brackets, or equal, and stainless-steel bolts using nylon locking nuts and insert nuts.

18.15.2 In compartment where tool boards are mounted the Unistrut shall be mounted on the floor and along the top of the compartment so that the tool boards are adjustable side to side.

18.16 All body compartment interiors shall be finished with a thermo-plastic coating, Rhino-liner, Line-X or equal, light gray in color.

18.17 All compartment fixed shelving, pull-out trays, and pull-out tip down trays shall be made of a minimum of 3/16” smooth aluminum, edges filed, corner joints welded and each corner drill with ¼”, minimum weep hole. All shelves and trays shall have a lip of 1 ½” on all sides.

18.17.1 All pull-out shelves, trays, and tool boards shall be equipped with an automatic locking device that holds the shelf or tray in the fully extended or fully retracted positions.

18.17.2 Compartment shelves, trays, and rollouts are to be finished with thermo-plastic coating, Rhino-liner, Line-X or equal, light gray in color.

18.18 All compartment floors, shelves and tray shall be lined with Versaflex red in color.

18.19 When Robinson Roll-up Doors (ROM) are specified the door shutters, side jambs, and header trim shall have ROM standard features and construction methods, and the following functions and features:

18.19.1 Full width lift bar, with dual striker blocks, the lift bar shall incorporate magnets to operate the door switches.

A) The striker blocks shall have integral door switches that activate the compartment lighting and the compartment open alarm.

18.19.2 Protection plate, drip tray under rolled up shutter to protect it from damage when equipment is being removed or placed into compartment and to keep water from dripping into the compartment when the door is opened when wet.

A) These plates shall be fitted with a drip tube to drain condensate outside of the compartment.

B) Protection plates fitted with a Truck-Lite 4” round, grommet mounted, LED light, color: white, center mounted in each protection plate and wired to the compartment lighting circuit.

18.19.3 Integrated stainless steel sill plate.

18.19.4 Door shutters, door jambs, and door header trim shall be painted job color red.

18.20 When hinged compartment doors are specified they shall be of double box pan design, constructed of body matching metal sheet stock.

18.20.1 Active doors shall be equipped with Eberhard polished stainless-steel bent “D” ring double latching, slam to lock door hardware, or equivalent.

A) Passive doors shall be equipped with a two (2) point slam to latch device, with an Eberhard polished stainless-steel bent “D” ring door hardware, or equivalent.

18.20.2 Doors shall be carried on full height or full width stainless steel piano style hinges. Hinges are to be bolted to the door and to the body, welding is NOT acceptable.

18.20.3 Vertically hinged doors shall be equipped with a single gas compressed shock absorber style door check to hold the door in fully open or fully closed position. Horizontally hinged doors shall have two (2).

18.20.4 Door switches that activate the compartment lighting and the compartment open alarm.

18.21 All body side compartment doors shall be protected by extruded aluminum drip molding, bright anodized aluminum.

18.22 All compartment doors, air bottle storage, deck gun and light tower shall be equipped with a warning system to alert the apparatus operator when they are not closed or properly stowed. (See 13.19).

18.23 All compartment sizes can have a variation tolerance of ± 5%.

18.24 Left (driver's) Side Body Compartments

18.24.1 Compartment L1, one (1) compartment immediately ahead of the rear wheels, approximately 72.0" high X 36.0" wide X 24.0" deep, minimum in the lower section, 12" deep, minimum in the upper section, door opening maximum obtainable.

A) Compartment shall have a Robinson (ROM) roll-up style door.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) One (1) 300 lb. roll out tray, floor mounted.

D) One (1), 200 lb. roll out tray, height adjustable.

E) One (1) height adjustable shelf in the 12" deep section.

F) Rear wall of the compartment, in the 12" deep section shall be fitted with PAC-Trac Series 7000 single sided tool board, full height, full width. Tool board to be mounted using PAC-Trac "Z" mount brackets along both sides.

18.24.2 Compartment L2, one (1) over the rear wheels, approximately 40.0" high X 64.0" wide X 12.0" deep, door opening maximum obtainable.

A) Compartment shall have a Robinson (ROM) roll-up style door.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) Rear wall of the compartment shall be fitted with PAC-Trac Series 7000 single sided tool board, full height, full width. Tool board to be mounted using PAC-Trac "Z" mount brackets along both sides.

18.24.3 Compartment L3, one (1) compartment behind the rear wheels, approximately 72.0" high X 48.0" wide X 24.0" deep, minimum in the lower section, 12" deep, minimum in the upper section, door opening maximum obtainable.

A) Compartment shall have a Robinson (ROM) roll-up style door.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) One (1) SlideMaster 600 lb. full extension, roll out tray, floor mounted.

D) One (1)), 200 lb. full extension, roll out tray, height adjustable.

E) One (1) height adjustable shelf in the 12” deep section.

F) Rear wall of the compartment, in the 12” deep section shall be fitted with PAC-Trac Series 7000 single sided tool board, full height, full width. Tool board to be mounted using PAC-Trac “Z” mount brackets along both sides.

18.25 Right (curb) Side Body Compartments

18.25.1 Compartment R1, one (1) compartment immediately ahead of the rear wheels, approximately 40.0” high X 36.0" wide X 24.0” deep, minimum in the lower section, 12” deep, minimum in the upper section, door opening maximum obtainable.

A) Compartment shall have a Robinson (ROM) roll-up style door.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) One (1) 500 lb. roll out tray, floor mounted.

D) One (1), 200 lb. roll out tray, height adjustable.

18.25.2 Compartment R2, one (1) over the rear wheels, approximately 8.0” high X 64.0" wide X 24.0” deep, door opening maximum obtainable.

A) Compartment shall have a double box pan door, hinged along the bottom edge.

B) Compartment shall be lit by one (1) On Scene Solutions Access LED lights, full width mounted along the top door jamb.

C) One (1), floor mounted, 200 lb. roll out tray.

18.25.3 Compartment R3, one (1) compartment behind the rear wheels, behind the rear wheels, approximately 40.0” high X 48.0" wide X 24.0” deep, minimum in the lower section, 12” deep, minimum in the upper section, door opening maximum obtainable.

A) Compartment shall have a Robinson (ROM) roll-up style door.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) One (1) 300 lb. full extension, roll out tray, floor mounted.

D) One (1), 200 lb. full extension, roll out trays, height adjustable.

18.26 Rear Body Compartments

18.26.1 Compartment B1, one (1) full height between the rear step and bottom of hose bed, full width between the body side compartments, compartment shall be provided centered in the compartment body at the rear tailboard, approximately 42.0" wide x 42.0" high x 24.0" deep, compartment shall be made as large as possible and the door opening maximum obtainable. Partitions between this compartment and the L-3/R-3 compartments are to be bolt in type.

A) Compartment door shall be a Robinson (ROM) roll-up style.

B) Compartment shall be lit by two (2) On Scene Solutions Access LED lights, full height mounted one (1) in each side door jamb.

C) Hannay Booster Reel floor mounted to the compartment left side, electrical and plumbing connections for the booster reel on the right side. Electric rewind motor switch mounted in the compartment final mounting location to be determined.

D) Rubber cup with retaining strap Ziamatic part # NCM-B-TFT mounted on the compartment floor to the right of the booster reel, final location to be determined.

18.26.2 Compartment B2 along the left side of the hosebed, behind the 12” deep upper section of the left side body compartments, a Little Giant ladder compartment to hold one (1) Little Giant Model 17 ladder.

A) Sheet stock aluminum thumb with two (2) spring loaded thumb latches and suitcase type handle.

18.26.3 Compartment B3 along the left side of the hosebed, behind the 12” deep upper section of the left side body compartments, above the Little Giant ladder compartment, a compartment to hold two (2) 10’ sections of 6” light weight hard suction hoses with 6” NST long handle female swivels and 6” NST rocker lug male ends.

A) Sheet stock aluminum with two (2) spring loaded thumb latches and suitcase type handle.

18.26.4 Compartment B4 along the left side of the Little Giant compartment, above the 12” deep upper section of the left side body compartments, a compartment to hold one (1) 10’ section of 6” light weight hard suction hoses with 6” NST long handle female swivels and 6” NST rocker lug male ends.

A) Sheet stock aluminum thumb with one (1) spring loaded thumb latches and suitcase type handle.

18.27 Ground Ladder Storage on the right side, above the body side compartments, enclosed with an access door on the rear of the apparatus body. Access door fabricated from

sheet stock aluminum with a minimum of two (2) spring loaded thumb latches and a suitcase type handle.

18.27.1 Storage in the compartment for the following complement of ground ladders and tools. Ground ladders and tools mounted so that are individually accessible. Ground ladder mounted on bean with plastic skid plates for ease of removal and stowing.

A) One-(1) Alco-Lite Model FL-10, 10' aluminum folding ladder.

B) One (1) Alco-Lite Model PRL-14, 14’ Roof Ladder

C) One (1) Alco-Lite Model PEL-24, 24’ two section extension ladder

D) One (1) Fire Hooks Unlimited 6’ Dry Wall Hook with solid steel shaft.

E) Fire Hooks Unlimited 8’ National Pike Pole with solid fiberglass shaft.

18.28 Rear Step

18.28.1 The rear step full width, at least 16" deep with the rear corners at 45° angles and be located at the back of the compartment body.

18.28.2 Rear step shall be of sufficient strength to hold the weight of several fire fighters in the performance of their duties with minimal deflection.

18.28.3 Rear step assembly shall be a welded assembly that is designed to be removable in the event of damage. Step assembly shall be bolted to the support structure that is integral with the rear body compartment supports and bolted directly to the vehicle chassis.

18.28.4 Rear step shall be slip resistant aluminum treadplate. Rear step shall be deigned to shed water and snow accumulations.

A) All mounting bolts used to fasten the tread plate to the step support shall be 3/16" minimum flat head Phillips type. Holes for these fasteners shall be countersunk so bolt heads are flush with the walking surface.

B) Self-tapping sheet metal screws shall not be used to install treadplate to the rear step framing.

18.28.5 Centered in the rear step same width, minimum as the B-1 compartment a pull-out step shall be furnished and installed, integral to the rear step at a common height when deployed. Step shall be able to support a minimum of 500 pounds (two firefighters).

A) Step equipped with an automatic latching device to hold in in the fully extended and fully retracted position.

B) Step surface shall be of an aggressive slip resistant open grate surface Bustin, Gripstrut, or equivalent.

C) Pull-out platform, step surface, supports, rollers, and all other components shall be stainless steel.

18.29 Rear Hose Beds

18.29.1 The compartment body/hose bed side panels shall be body matching material and hose bed partitions shall be type 5052-H32 marine grade aluminum. Hose bed dividers and the back of the body side compartments walls forming the hose bed are to be unpainted and brushed finished.

A) The vertical corners at the back hosebed trimmed with brushed stainless-steel extending from the hosebed floor level up to the top of the body side.

18.29.2 The forward area of the hose bed area shall be an open dunnage area where the water, foam tanks fill towers and an area for the light tower to be stowed. The light tower storage area shall extend all the way to the left side of the apparatus.

A) Mounting area for nested light tower shall be recessed so that the tower sits completely in a dunnage area with no part or parts or fixtures sticking above the body roof line.

B) Nesting area shall be equipped with a minimum of two (2) 1” or larger drain holes located opposite each other and fitted with strainer screens. Drains shall be piped through compartment body and discharge below the chassis rails.

18.29.3 The light tower stow area floor shall have under supports and framing as needed to support the light tower in operation fully extended without creating any operational limitations.

18.29.4 Hose bed floor shall be a no more than 62 inches (62”) above the rear step.

18.29.5 Two (2) aluminum hose bed dividers shall be furnished to separate individual hose loads.

A) Dividers shall be fully adjustable by providing slide tracks at the base of the dividers front and rear of the hose bed. A slide track shall also be installed at the rear of the hose bed, top of the dividers.

B) The dividers shall be held in place by tightening two (2) 5/16" Phillips flathead bolts, or equivalent at the forward and rear lower ends of the partition and also at the rear upper end. Mounting bolts shall turn into threaded slide blocks located inside the track. Holes in the welded on partition legs shall be countersunk so that bolt head is flush with the surrounding surface and will not damage hose.

C) Each of the dividers shall have a reinforcing frame around the divider perimeter and an oval cut-out in the rear (back) edge toserve as a handhold, cut-out shall be rounded and smooth.

D) Basic partition shall be one piece design, reinforced at the top and each end. Forward and rear upper corners shall have a 1-1/8" welded, double plain, miter joint (forming a 30-degree angle) to eliminate sharp ends.

E) Bottom edge of partition shall have a 1-1/2" 90-degree reinforcement flange.

F) Hose bed flooring shall be aluminum slates for good ventilation. Slats shall be removable for maintenance.

18.29.6 Hose beds shall have the following capacities and layout beginning from the left (street) side of the apparatus:

A) 500 feet of 3” double jacketed fire hose in 50-foot lengths.

B) 1200 feet of 5” single jacket urethane fire hose in 100-foot lengths with Storz connectors.

C) 350 feet of 2½” double jacketed fire hose in 50-foot lengths, pre-connected.

18.29.7 Rear hose beds shall have an NFPA compliant hose restraint system using 40 oz. per square yard polyester fabric coated with a urethane (vinyl) top coat, red, furnished by D&S Custom Covers of Rockwood, Pa.

A) The hose bed covers shall be held in place by a system of shock cords and stainless steel hook loops. The rear flap of the hose bed cover shall be weighted and cover the hose bed opening in its entirety.

B) The rear flap of the hosebed cover shall have 8” tall retro-reflective lettering, color: white reading “East Freehold”

18.30 On the rear of the compartment body at the bottom of the host bed, full width an intermediate, NFPA compliant slip resistant aluminum treadplate step shall be furnished installed.

18.30.1 Enclosed in the outboard edge of the rear step 1 ¼” grab handle, full width.

18.30.2 Handhold cutouts in the step, filed and smooth to allow access to the grab handle.

18.31 Body Handrails

18.31.1 Handrails and hardware shall be NFPA compliant, Hansen 4000 LED lighted series Anti Slip Rail or equivalent. Grab rail LED lighting shall be interfaced with the apparatus Maxi (parking) brake so that LEDs automatically come on when the Maxi is set and shut off when the Maxi brake is released.

18.31.2 All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion.

18.31.3 Body handrails shall be furnished and installed as follows:

A) One (1) approximately 36" handrail shall be provided and installed on the forward edge of the top of the body of the apparatus directly on the rear body, located in front of the tank fill tower.

B) Two (2) handrails a minimum of 30" long, shall be provided and installed one (1) on both the right and left beavertail or body side, i.e. in a convenient location for assistance in climbing onto and off the rear step.

C) One (1) full width grab handle shall be installed at the rear, directly below the hose bed, horizontally with a support stanchion in the middle of this grab bar.

D) Two (2) 24” and two (2) 36” handrails shall be furnished, mounting location to be determined.

E) There shall be two (2) 10” grab handles furnished and mounted, one (1) on each side of the compartment body, forward, at the top of the front face.

18.32 Ten (10) NFPA compliant heavy duty folding steps, with integral LED step lighting shall be furnished and mounted, final mount locations to be determined.

18.32.1 Mounted steps shall have a back-up plate to distribute weight loads and strengthen step mounting.

18.33 Body Rub Rails

18.33.1 Anodized aluminum rub rails shall be provided on both the left and right sides, along the lower portion of the body, beneath the compartment doors, full length to prevent damage to the body and finish.

18.33.2 The rub rails shall be a minimum of 2 ½” wide x 1" deep and shall be mounted on poly-urethane spacers. Rub rails shall have a 1" x 1" chamfer at the front and rear of the rail.

18.33.3 The rails shall protrude approximately 1 ½” from the face of the body.

18.33.4 Silver reflective tape 3M or equivalent 1” wide shall be furnished and installed in the center channel of the rub rails.

18.34 Wheel Well Compartments

18.34.1 There shall be two (2) air bottle compartments, one (1) in the left side wheel well, forward and one (1) in the right-side wheel well, forward.

18.34.2 The compartments shall be fabricated from 14-gauge, minimum stainless steel or 3/32” minimum brushed aluminum and shall provide a minimum of 24.5" usable depth.

18.34.3 Each compartment doors shall be equipped with a positive locking device.

18.34.4 Each compartment shall be able to store three (3) 30-minute air bottles. Compartments will have dividers to keep air bottles from rolling around and the bottom half, and the rear wall of the storage tube shall be lined with rubber pad to prevent bottle damage.

18.34.5 Right side, rear wheel well compartment sized and braced as needed to hold two (2) fire extinguishers. One (1) 2.5-gallon water extinguisher and one (1) 20 lb. ABC fire extinguisher.

18.34.6 Left side, rear wheel well compartment for diesel fuel fill and speedy-dry storage and discharge hopper.

A) Speedy-dry hopper capacity approximately 40 pounds of product.

18.34.7 Wheel well storage compartment doors are to match for uniform appearance and incorporated into the compartment open warning system.

19 Tools and Equipment

Proposed As:	
Spec.	Equal

19.1 In addition to tools and equipment specified elsewhere in these specifications the following shall be furnished and delivered with the vehicle.

19.1.1 Unless otherwise stated all tools and equipment shall be mounted, final mounting locations to be determined between the successful bidder and Freehold Township Fire District No. 2

19.1.2 Tool mounts, brackets, fabricating, hardware and labor need for mounting the tools and equipment shall be included, unless otherwise specified.

19.2 The following ground ladders shall be furnished and mounted on the right side of the apparatus body.

19.2.1 One-(1) Alco-Lite Model FL-10, 10' aluminum folding ladder.

19.2.2 One (1) Alco-Lite Model PRL-16, 16’ roof ladder.

19.2.3 One (1) Alco-Lite Model PEL-24, 24’ two section extension ladder.

19.3 The following pike poles shall be furnished and mounted as specified:

19.3.1 Two (2) Fire Hooks Unlimited 6’ New York Roof Hook with steel shaft and chisel end. Mounted one (1) each side of the cab on the rear wall, exterior.

19.3.2 One (1) Fire Hooks Unlimited 8’ National Pike Pole with steel shaft. Mounted on the ground ladder rack right side of the apparatus body.

19.5 One (1) pair of NFPA compliant Ziamatic folding wheel chocks model SAC-44 shall be supplied and installed on the apparatus.

19.5.1 Wheel chocks shall mounted on the exterior of the vehicle under compartment L1, ahead of the rear wheels in standard Zico trays.

19.6 One (1) CTV Respond Ready six (6) drawer custom tool box with drawer dividers, approximately 40” wide, 24” deep, 20” high, five (5) drawer custom tool box with drawer dividers.

19.7 Six (6), Streamlight Vulcan LED flashlights by with 12 volt DC vehicle mounted chargers and shoulder straps shall be furnished and installed. Six (6) units mounted in the crew cab area, one (1) at the Officer’s seating position, and one (1) mounted in the compartment body, final mounting locations to be determined.

19.9 One (1) Ziamatic Corp. Quick Bar, Model # MB-B/A, NFPA complaint axe and Halligan mounting bracket shall be furnished and installed in the right rear crew cab area. A polished aluminum treadplate box shall be fabricated and mounted on the floor for the axe head to sit inside.

19.10 Two (2) Akron Style 443 Wrench Mounts shall be furnished and installed.

19.10.1 Each holder will be furnished with one (1) Style 15 Hydrant Wrench and two (2) Style 10 Spanner Wrenches.

19.11 One Task Force Tips model XFIH-E21A Hurricane remote control monitor furnished and installed.

19.11.1 One (1) Task Force Tips model XFC-62 Pumper Combination Package with 18” extend-a-gun riser. XFC-62 package includes combination nozzle, four (4) stacked straight tips, stream shaper, and portable ground base.

19.11.2 One (1) Task Force Tips model Y4E-CT-10 Tethered Monitor Operator Station furnished and mounted on the pump operator’s panel. May be direct wired.

19.12 Two (2), 10’ lengths of Kochek 6” lightweight hard suction hose with National Standard Thread pyro-light couplings.

19.12.1 Male couplings to have rocker lugs and the female couplings long handles, fixed.

19.13 One (1), Little Giant Ladder, Revolution model 17, with ratchet levelers furnished and mounted. Final mounting location in compartments L3/R3.

19.14 One (1) 3/16” smooth poly box with the approximate dimensions of 14” X 14” X 8” deep shall be fabricated and shipped loose.

19.15 One (1) 3/16“ smooth poly tool box with the approximate dimensions of 18” deep 8” wide x 5” high with two (2) partitions shall be fabricated and shipped loose.

19.16 Mount one (1) safe, furnished by the Fire District, with four (4) bolts in a location to be determined.

20 Hydraulic Generator and 120/240 Volt Electrical System

Proposed As:	
Spec.	Equal

20.1 Line voltage electrical system wiring and generator installation shall conform to all applicable National Fire Protection Association Standards-Auxiliary Systems, NFPA70 & National Electric Code.

20.2 All 120/240 volt wiring in the apparatus body shall be enclosed in Sealtite or Corrlok, flexible moisture resistant reinforced conduit, with proper seal-tight connectors and hardware.

20.3 All 120/240 volt wiring shall be stranded copper THHN or THWN type, wire gauge and amperage rating to comply with the National Electrical Code.

20.4 All electrical equipment including but not limited to; switches, circuit breakers, outlets, and cable reel shall be labeled. Labeling shall be color coded, permanent type engraved, cast, or embossed.

20.4.1 All circuit breakers shall be labeled with their function and all electrical devices shall be labeled with the number of their corresponding circuit breaker.

20.4.2 Cable reel(s) and outlet(s) labeling shall also include output voltage and amperage.

A) Outlet label shall also include the circuit amperage.

20.5 One (1) Harrison Hydraulically Driven Generator, single phase, rated at 8.0 kilowatts (kW), minimum, shall be furnished and installed. The generator must be capable of producing the full rated output power when driven from the vehicle PTO with engine speeds from idle to maximum engine speed.

20.5.1 The motor/generator shall be a self-contained unit, placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, and oil filtration.

20.5.2 Also inside the mounting enclosure shall be the hydraulic motor on/off manifold containing a cross port check valve allowing unit to be started and shut down remotely.

20.5.3 The mounting frame or cabinet shall be generator manufacture's standard and be designed so that it can stepped on or stood upon without sustaining damage.

20.5.4 A generator cover, fabricated from Bustin, Gripstrut or equal aluminum open grating, will be installed above the generator if/as needed. The cover will be easily removable for service and provide ample airflow for cooling the generator.

20.5.5 The reservoir shall include an oil level sight gauge, oil temperature gauge, fill cap, and oil filter.

20.5.6 The generator and motor shall be close-coupled, using a maintenance free coupling, and aligned.

20.5.7 A venturi boost unit or similar feature shall be included to provide positive pressure to the pump suction port.

20.5.8 The hydraulic motor and pump shall be of axial piston design, no gear pumps or motors will be used. The pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

20.5.9 The system shall be capable of normal operations using a commonly available Automatic Transmission Fluid (ATF), such as GM Dextron III or equivalent.

A) All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

20.6 The generator shall be mounted in the open dunnage area in the pump enclosure, mounting location shall insure adequate fresh air supply for system cooling. So that generator may be used in local ambient temperatures for long periods of time without overheating.

20.6.1 Generator shall be mounted so that it can be serviced and/or repaired without the need to unbolt, move, or remove it from its mounts.

20.7 The generator system must be able to operate on Hot Shift PTO (See 10.7) and must be able to be engaged, disengaged, and used while vehicle is either stationary, in motion, or operating in fire pump mode.

20.7.1 The generator shall be able to be turned on (engaged) and off (disengaged) from switches located on the vehicle dashboard and on the Pump Operator's panel.

20.7.2 There shall be an emergency power disconnect switch on the dashboard to disengage the generator PTO in case of system trouble or failure. This switch shall be shielded and clearly labeled.

20.8 There shall be a Fire Research Corp. FROG digital meter containing the volts, amps, frequency, hydraulic oil temperature, and hour meter supplied and installed with the generator.

20.8.1 The FROG meter shall be mounted on Pump Operator's panel.

20.9 A Square D Circuit Breaker enclosure Type QO (Load Center) including flush cover with door shall be furnished and installed in Compartment L-1 on the front (forward) wall as high as possible without interference to other tools and equipment mounted in this compartment.

20.9.1 Load center shall have the capacity for one (1) two pole main circuit breakers and twelve (12) distribution circuit breaker slots that can be used for either single pole or two (2) pole circuit breakers.

20.9.2 Main circuit breaker shall have a rating of 50 amps, maximum.

20.9.3 Circuit breakers for the following circuits shall be furnished and installed:

A) One (1), two-pole 30-amp, slow blow type circuit breaker for the cable reel.

B) One (1), 20-amp, two-pole circuit breakers, for power to the light tower.

C) Two (2), 15-amp single pole circuit breakers, for body mounted outlets.

20.10 One (1) automatic transfer switch shall be furnished and installed to power 30 amps of 120-volt circuits. Circuits powered to be determined at pre-construction conference.

20.11 One (1) Command Light Model SL442A-FS 120-volt light tower with electric raise and lower, mounting for four (4) light heads, with backlighting option shall be furnished and installed on the apparatus body forward of the hose bed.

20.11.1 Mounting area for nested light tower shall be recessed so that the tower sits completely in a dunnage area with no part or parts or fixtures sticking above the body roof line.

A) Nesting area shall be equipped with a minimum of two (2) 1” or larger drain holes located opposite each other and fitted with strainer screens. Drains shall be piped through the compartment body and discharge below the chassis rails.

20.11.2 The electrical controls to raise and lower the tower shall be a hand-held umbilical line remote control with a minimum of a fifteen-foot (15') cord that will allow the operator to stand back from the apparatus to view the light tower during movement.

20.11.3 Controls on the remote shall be at minimum:

A) Two (2) switches for the lighting, one (1) for each bank.

B) One (1) switch to control the “backlight” option.

C) One (1) switch for elevating/lowering the lower stage.

D) One (1) switch for elevating/lowering upper stage.

E) Tow (2) indicator lights, one (1) indicator light to indicate when light bank is rotated to proper nest position and one (1) indicator light to indicate when light bank is out of roof nest position.

20.11.4 The tower shall have an “auto-stow” function that when activated will stow, retract, and automatically shut power off to the unit. A travel rest to support the unit when it is in a nested position shall be provided.

20.11.5 Four (4) Fire Research Spectra, 120-volt, 20,000 lumen light fixtures installed on the light tower.

20.11.6 One (1) strobe light, color blue, clearance light shall be mount on or close to the top of the light head assembly and shall automatically turn on when the light tower is raised and shut off when tower is nested.

20.11.7 Light tower shall be wired into the Cab Door Open, Compartment Door Open, and Equipment Not Stowed Warning System. (See 13.18)

20.12 One (1), Hannay® electric rewind cable reel shall be provided, equipped with four (4), fully enclosed 30-amp collector rings. Reel to be painted job color red and mounted.

20.12.1 Electrical reel to be mounted in the pump enclosure and/or the compartment body base on available space. Final mount locations to be determined.

20.12.2 Cable reel to be supplied by a two-pole 30-amp, slow blow style circuit breaker, each.

20.12.3 Cable reel shall be equipped with a 4-Way stainless steel roller fairlead assembly with a ball stop, each.

20.12.4 Cable reel to be equipped with 200’ feet of 10/4 copper electrical wire, yellow in color, each. Each cable reel will terminate in a NEMA L14-30 30-amp, four (4) wire, twist lock receptacle.

20.12.5 One (1) Circle D four (4) outlet junction boxes rated for wet locations, equipped with a pilot light to indicate when generator power is supplied. Mounting for junction box shall be furnished and installed.

A) Circle D junction box shall terminate with an 18”, 10/4 copper electrical wire, yellow in color, pigtail, with a NEMA L14-30 30-amp, four (4) wire, twist lock plug.

B) Junction box outlets shall be two (2), NEMA L5-20 twist lock, and two NEMA 5-20 T-slot duplex. Mounted one (1) of each on either side of the junction box.

C) Outlets equipped with spring loaded weatherproof covers.

20.13 Two (2), 120-volt, 15-amp duplex outlets shall be furnished and installed in the compartment body. Final mounting location to be determined.

20.13.1 Outlets shall be wired through the transfer switch so that it is powered when the apparatus is plugged into “shore power” and when the generator is operating.

A) Switching between power sources shall be automatic.

21 Paint, Lettering, and Graphics

Proposed As:	
Spec.	Equal

21.1 The complete exterior of the apparatus shall be painted with automotive polyurethane paint of the highest quality.

21.1.1 The apparatus body and the cab from the lower windshield line down shall be painted red, non-metallic, color number to be determined.

21.1.2 The cab from the lower windshield line up shall be metallic gray, color number to be determined.

21.1.3 The successful bidder shall inspect the current Freehold Township Fire District No. 2 apparatus to make sure the paint, lettering, and graphics match existing apparatus as closely as possible.

21.2 The chassis frame, bumper extension, suspension, axles, air tanks, battery boxes, and all running gear, etc shall be painted job color red, by the manufacturer.

21.2.1 No air brake piping or wiring shall be painted. The chassis frame, axles and other components painted prior to wiring and brake line installation.

21.2.2 Fuel tank exterior Line-X color to be red if chassis is panted and black if chassis is galvanized.

21.2.3 If the manufacturer is offering galvanized chassis rails and components the galvanized parts do NOT need to be painted. All components not galvanized should follow the painting requirements detailed.

21.3 The exterior and interior of the cab shall be finish painted prior to installation of glass, wiring, and trim, before the doors are mounted or any assembly is started to insure a finished painted surface beneath trim items.

21.3.1 The cab doors shall be fitted, then removed and painted separately to ensure finish paint behind the hinges, door hardware, and seals.

21.3.2 The cab interior shall be painted with a thermo-plastic coating, Rhino-liner, Line-x, or equal, color black.

21.4 The pump compartment and compartment body shall be primed and finish painted prior to installation on the chassis to ensure paint coverage in all areas.

21.4.1 The compartment doors shall be fitted, then removed and painted separately to ensure primer paint behind the hinges, door jambs, header trim, and seals.

21.4.2 Fire pump, pump transmission, rigid plumbing, valve bodies, etc shall be painted job color red prior to installation on the chassis assembly.

A) Four (4) pump anodes shall be painted yellow to increase visibility.

21.5 The exterior of the compartment body shall be finish painted prior to installation wiring, overlays, bolt on fixtures or components, and before the doors are mounted to insure a finished painted surface beneath these items.

21.5.1 The compartment doors shall be fitted, then removed and painted separately to ensure finish paint behind the hinges, door hardware, and seals.

21.5.2 ROM roll-up compartment doors, door headers, jambs, and trim are to be painted job color red.

21.6 Compartment interiors shall be painted with a thermo-plastic coating, Rhino-liner, Line-x, or equal, color light gray.

21.6.1 All compartment shelves and trays are to be painted with a thermo-plastic coating, Rhino-liner, Line-x, or equal, color light gray.

21.7 All surfaces shall be sanded and all welds properly cleaned. All substrates shall be thoroughly cleaned, before painting, with a chemical/phosphatizing cleaner.

21.7.1 All surfaces shall be wiped with wax and grease remover prior to priming to ensure all surfaces being painted are clean and free of any compounds or contaminants that could inhibit paint adhesion.

21.8 All prepared surfaces shall be primed with a minimum of three (3) coats of primer, one (1) wet coat of self-etching primer and two (2) cross-coats of urethane lead and chrome free primer.

21.9 The entire unit shall be DA sanded using 280 grit or finer to provide for the optimum topcoat appearance. Cleaner shall be used to remove all sanding dust prior to topcoat application. Top coat shall be Dupont # 6000, Sikkens, PPG or equivalent.

21.9.1 Upon completion of the color coats, a clear coat paint finish shall be applied to the entire exterior of the vehicle.

21.10 Interior surfaces of the hose beds and the hose bed partitions shall DA sanded, unfinished aluminum.

21.11 The apparatus cab shall be undercoated with a solvent based, abrasion resistant, sound deadening, spray applied undercoating. Undercoating shall meet or exceed the performance properties in standards American Society for Testing Material (ASTM) B-117 for salt spray and ASTM D-1748 for humidity.

21.1.1 Undercoating shall be applied in the interior of structural metal tubing in the cab and chassis where the open end of the tubing is exposed to road splash.

21.12 A single six inch (6”) by dual one inch (1”), 1” x 6” x 1”, Scotchlite reflective band, 1” white in color, 6” black in color, shall be provided across the front of the apparatus, along the sides of the body.

21.12.1 Beginning after the pump panel, the stripe will break up and rise above the height of the rear wheel arch, then turning horizontal again, shall continue towards the rear of the apparatus.

21.13 Rear of apparatus, 50% minimum, shall be covered in an alternating red and lime green retroreflective stripes, 3M Diamond Grade, arranged in an alternating striped Chevron

pattern, oriented up in the center of the vehicle. Approximate width of each Chevron strip shall be 6”.

21.13.1 Area of coverage and layout of stripping pattern on rear of the apparatus shall be NFPA compliant.

21.13.2 Matching chevrons stripes applied to the metal edge on rear full width mud flap.

21.14 On the rear compartment roll-up door at the top, five (5) digit apparatus number in 10” Scotchlite red reflective block numbers with a black outline. Along the bottom edge of the door “KEEP BACK 200 FEET” in 3” Scotchlite red reflective block letters with a black outline.

21.15 D.O.T. conspicuity tape shall be applied to the leading edge of all compartment fixed shelves, pull out shelves and trays and pull-out tool boards, full height or full width.

21.15.1 D.O.T. conspicuity tape shell be applied to the forward facing and rear facing surfaces of all pull-out shelves, tray or tool boards.

21.16 Lettering font, graphics design, color and shading shall match current Freehold Township Fire District No. 2 apparatus. It is the responsibility of the bidder to visit the firehouse to inspect and photograph the apparatus to match the artwork and graphics.

21.17 A drawing minimum size ANSI Engineering Drawing size “D”, 22” x 34” showing the graphics design and layout shall be submitted to Freehold Township Fire District No. 2 for review and approval prior to the work being performed.

22 Inspections, Delivery, Training, and Service

Proposed As:	
Spec.	Equal

22.1 Pre-Construction conference shall be held at the factory of the successful bidder within forty-five (45) days of the award of contract.

22.1.1 Engineers from the chassis and body divisions shall be present or available for consultation as needed.

22.1.2 The pre-construction conference shall be one (1) day for the cab and chassis assemblies and one (1) day for the body and pump components.

22.2 The successful bidder responsibility shall be to make the manufacturing facility, engineering and other personnel available to meet with the Apparatus committee and their consultant.

22.2.1 The successful bidder shall coordinate the dates and times of the pre-construction conference and the two (2) inspections trips with the Apparatus Committee.

22.2.2 Freehold Township Fire District No. 2 will be responsible for all travel, lodging, transportation and meal expenses for the Apparatus Committee and their consultant.

22.2.3 Pre-Construction Conference

A) Held at the apparatus manufacturer's plant.

B) Six (6) representatives of the Freehold Township Fire District No. 2.

C) A minimum of an overnight trip with a with at least two (2) FULL business days at the factory.

22.2.4 Inspection: Chassis & Body In-process Inspection

A) Held at the apparatus manufacturer's plant.

B) Scheduled after installation of cab on frame rails, after drive train, brake system, axles, other chassis components and the fire pump are installed on chassis frame. On completion compartment body and painting, prior to final installation of compartment body on chassis, and before installation of doors and other components, lighting, body striping and graphics.

C) Six (6) representatives of the Freehold Township Fire District No. 2.

D) A minimum of an overnight trip with a with at least two (2) FULL business days at the factory

22.2.5 Inspection: Final Inspection

A) Held at the apparatus manufacturer's plant.

B) Scheduled upon completion, or near completion (minimum 95% complete) of the apparatus, and prior to it being shipped to the dealer.

C) Six (6) representatives of the Freehold Township Fire District No. 2.

D) A minimum of an overnight trip with a with at least two (2) FULL business days at the factory.

22.3 The fire apparatus shall be delivered over the road and under its own power to insure proper break-in of all driving components while still under warranty. Rail or truck freight shipment of the apparatus is not acceptable.

22.3.1 The completed apparatus will be delivered to:

Freehold Township Fire District No. 2
191 Dutch Lane Road
Freehold, NJ 07728

22.4 Training on the operation of this apparatus, its features, components, care, and maintenance shall be provided upon the delivery, and before acceptance of this apparatus.

22.4.1 The representative conducting the training must be a qualified agent of the local dealer or a direct employee of the manufacturer of the apparatus.

22.4.2 The familiarization period shall consist of a total of 24 hours, minimum. The schedule of the instruction sessions shall be arranged by mutual agreement of the Freehold Township Fire District No. 2 and the successful bidder. Training sessions may include nights and weekends.

22.5 The bidder shall have a factory authorized service and repair facility located within fifty (50) miles of the Freehold Township Fire District No. 2, 191 Dutch Lane Road, Freehold, NJ 07728

22.6 Bidder shall employ mechanics that have current certifications from Emergency Vehicle Technician Certification Commission, and the National Institute for Automotive Service Excellence in the areas of work the technicians perform.

22.6.1 Fire Apparatus technicians shall also be manufacturer factory trained in the maintenance and repair of the apparatus.

22.7 Service facility shall be fenced, secure and provide for heated, indoor storage when apparatus must be left overnight.

22.8 Bidder shall have a minimum of two (2) mobile service vehicles and be able to respond to the Freehold Township Fire District No. 2 in 24 hours or less, for out of service conditions.

23 Warranties

Proposed As:	
Spec.	Equal

23.1 The bidder shall provide, at a minimum, the following warranty. If the standard warranty provided by the apparatus manufacturer or their vendor is better than the warranty included herein, that warranty shall be provided.

23.2 The apparatus manufacturer and/or their vendor, warrants to the original owner that each new fire apparatus manufactured, its parts, components, and systems in its entirety (bumper to bumper) shall be free from defects in material and workmanship under normal use and service for a period of two (2) years from the date of acceptance.

23.2.1 The apparatus manufacturer and/or their vendor's obligation under this warranty is to repair or replace, as needed any part or parts thereof including equipment, trade accessories, and custom fabrications, (except tires) supplied by, fabricated, or included in the manufacture of the apparatus.

23.2.2 The apparatus manufacturer and/or their vendor may require that any/all parts replaced under warranty shall be returned to them for examination for purposes of determining to the apparatus manufacturer and/or their vendor's satisfaction those parts to have been defective.

23.3 During the two (2) year warranty period, beginning with the date of acceptance the apparatus manufacturer and/or their vendor shall act as the sole source for all warranty claims. The apparatus manufacturer and/or their vendor shall be the contact point and coordinator for any and all warranty claims regardless of the component or vehicle system involved in the claim.

23.3.1 They shall coordinate and resolve any and all warranty issues to completion.

23.3.2 Any warranty issues not completed at the end of the two (2) year warranty term shall be considered open items and shall continue to be the responsibility of the manufacturer or their representative until any open issue or issues are complete.

23.3.3 If apparatus chassis manufacturer is different from the body manufacturer all warranty claims are the responsibility of the apparatus body manufacturer and/or their vendor.

23.4 This warranty shall not apply to:

23.4.1 Normal maintenance services or adjustments, including but not limited to fuel system cleaning, wheel alignment and balancing, engine tune-up, brake inspection or adjustment, nor to the replacement of fluids or filters.

23.4.2 Any apparatus which shall have been repaired or altered in any way outside of the apparatus manufacturer factory, and/or their vendor's repair facility, or by anyone not authorized to perform warranty work by the apparatus manufacturer and/or their vendor to do so.

23.4.3 Any apparatus which has been subjected to misuse, abuse, negligence or accident, or to any apparatus which shall have been operated or loaded beyond the factory rated capacity of the components.

23.5 Two (2) year warranty shall be parts and labor inclusive.

23.6 The following additional warranties shall be provided (included) with this apparatus and be parts and labor inclusive.

23.6.1 Corrosion Warranty

A) A ten (10) year, minimum, corrosion perforation warranty shall be provided on the cab and body.

23.6.2 Paint Warranty

A) Manufacturer warrants that its paint finish shall be free from defects and it will not incur corrosion, blisters, unreasonable color or gloss loss, or delamination for a period of seven (7) years.

B) This guarantee shall include but is not limited to:

C) Peeling or delamination of the topcoat and/or other layers of paint.

D) Cracking or checking, loss of gloss caused by cracking, checking and hazing.

E) Paint warranty shall be non-pro-rated.

23.6.3 Structural Warranty – Cab and Body

A) A ten (10) year minimum, structural warranty shall be provided on the cab and body.

B) This shall include warranty against cracking of any/all cab or body support structures and or cab or body panels.

23.6.4 Structural Warranty – Chassis

A) Vehicle chassis and cross members shall have a twenty (20) year, minimum, warranty against cracking, or failure.

23.6.5 Booster Tank Warranty

A) Poly-booster tank, shall be covered by a lifetime warranty.

B) Booster tank warranty shall be parts and labor inclusive.

23.7 Manufacturers of components used in the construction of this apparatus offer standard warranties on their products for longer coverage than the minimums stated in this section. These warranties shall remain in full force and effect. In no case, shall warranty life be decreased.

23.7.1 Manufactures standard warranties that offer longer coverage time shall be used in coverage of this apparatus. These shall include, but not be limited to the following:

A) Hale Products, on the fire pump and related components.

B) Meritor on the front and rear axle components.

C) Cummins Diesel engine & all components covered by five (5) year/100,000 mile, minimum warranty, 100% parts & labor.

D) Allison Transmission, transmission and all components covered by five (5) year warranty, 100% parts & labor.

23.7.2 Apparatus manufacturer shall include with the finished vehicle a detailed list of all warranties, component warranties this list shall state warranty coverage periods and contact information for all component manufacturers warranty issues.

24 Test Requirements, Documentation, and Manuals

Proposed As:	
Spec.	Equal

24.1 The complete apparatus shall perform and pass the testing detailed in NFPA 1901 Standard for Automotive Fire Apparatus, as applicable. All testing shall be performed by and certified by Underwriters Laboratories, Inc. or an equivalent independent third party testing agency meeting the requirements of NFPA 1901 Standard for Automotive Fire Apparatus Chapter 4, Section 7.

24.1.1 All apparatus testing shall be conducted in accordance with NFPA recommendations and testing criteria as detailed in the current edition of NFPA 1901 Standard for Automotive Fire Apparatus for the apparatus, apparatus system, component, or function being tested.

24.2 Road test(s) with the apparatus loaded to its estimated in-service weight shall be performed to verify that the apparatus when loaded will perform as required and to verify the roadability, handling and performance of the completed apparatus. All road tests shall be performed in compliance with NFPA recommendations detailed in NFPA 1901 Standard for Automotive Fire Apparatus Chapter 4, Sections 15 and 17.

24.2.1 Road test shall be conducted on dry, level (except for the grade test), paved roads in good condition and free from loose sand, debris, grease, oil or other spillage that will reduce traction. The apparatus shall meet or exceed the performance requirements as detailed in NFPA 1901.

24.2.2 When loaded to its estimated in-service weight the apparatus shall NOT have less than 25% and no more than 45% of the weight on the front axle and not less than 55% and no more than 75% on the rear axle.

24.2.3 When loaded to its estimated in-service weight the apparatus difference between the weight on left wheels and the weight on the right wheels shall not exceed 7% (seven percent).

A) Manufacturer shall furnish a weight certificate, from a DOT certified truck weigh station showing weights on front axle, rear axle, the weight at each wheel point, and total weight for apparatus at time road test(s).

24.2.4 At a minimum the following testing shall be performed:

A) Acceleration test consisting of two (2) passes over the same test roadway in opposite directions.

B) Auxiliary braking system test, done in compliance with auxiliary brake system manufacturer's recommendations to verify that the system is working correctly.

C) Driving on 6% (six percent) grade to test ability to maintain minimum speed under load.

24.2.5 When loaded to its estimated in-service weight and tested the apparatus shall be able to:

A) Accelerate to 35 mph from a standing start within 25 seconds on a level paved highway without exceeding the maximum governed rpm of the engine.

B) Capable of obtaining a minimum top speed of 50 mph on a level paved highway with the engine not exceeding its governed rpm.

C) Maintain a speed of 20 mph or greater, on any grade up to and including 6% (six percent).

24.2.6 A service brake test performed with the apparatus loaded to its Gross Vehicle Weight Rating (GVWR), the service brakes shall bring the apparatus to a complete stop in thirty five feet (35') or less when traveling at 20 mph. The stopping distance shall be verified by actual measurement.

24.2.7 General driving test on a combination of local roads and highway conducted utilizing a continuous run of twenty five (25) miles, or more shall be made during which time the apparatus shall show no loss of power or overheating.

A) The diesel motor, transmission, drive shaft(s), front and rear axles and all wheel points shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

24.3 The following apparatus components shall be tested as required in NFPA 1901, where applicable the test shall be performed concurrently to simulate real world operating conditions.

24.4 The vehicle electrical system (12 volt) shall be tested in compliance with NFPA recommendations detailed in NFPA 1901 Standard for Automotive Fire Apparatus Chapter 13, Section 14.

24.4.1 Alternator full load test shall be for a minimum of two (2) hours with all electrical equipment in operation and load management devices in operation.

A) Load shedding is acceptable during this test cycle, the low voltage alarm system shall NOT activate during this period.

24.5 A three (3) hour acceptance test shall be performed by and certified by a third party testing company on the fire pump and associated equipment. All required tests detailed in NFPA 1901 Standard for Automotive Fire Apparatus Chapter 16 including but not limited to pump discharge rates and pressures, pressure regulating devices, pressure relief devices, priming system, vacuum test, leak test, and tank to pump flow rate.

24.5.1 All tests shall be done in compliance with NFPA recommendations detailed in NFPA 1901 Standard for Automotive Fire Apparatus Chapter 16, Section 13.

24.5.2 Pump acceptance test shall be performed from draft. Pump testing done from a pressurized water source is NOT acceptable.

24.5.3 Pump acceptance test shall be witnessed by a member of Freehold Township Fire District No. 2, if possible.

24.6 Line voltage (120/240 volt) electrical system shall be performed by and certified by a third party testing company. Electrical load test shall be done in compliance with NFPA recommendations detailed in NFPA 1901 Standard for Automotive Fire Apparatus Chapter 22, Section 15, test duration shall be a minimum of (two) 2 hours with all electrical equipment in operation, a full load condition.

24.7 There shall be no partial, temporary, conditional certifications of any test results. The apparatus, apparatus component, apparatus system(s) shall pass the test(s) in their entirety. If any portion if the test is failed, or not completed the test shall be conducted from the beginning.

24.8 In the event the apparatus, apparatus component, or apparatus system(s) fails to meet or fails any of the test requirements required by NFPA 1901 or these specifications during the first set of test trials a second set of trials may be scheduled, at the option of the manufacturer. The second set of test trials must be scheduled within 30 days of the date of the first trials.

24.8.1 The second set of test trials shall be final and conclusive and failure to meet or pass all of the test requirements required by NFPA 1901 or these specifications will be cause for rejection of the apparatus by the purchaser.

24.8.2 Permission given to the manufacturer or their representative to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the Fire Department during the above specified period shall not constitute acceptance.

24.9 Two (2) sets of engineering blueprints, minimum size shall be ANSI Engineering Drawing size “D”, 22” x 34”, highly detailed, specifically for this apparatus, shall be provided by the manufacturer for review by Freehold Township Fire District No. 2 before the pre-construction meeting. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing.

24.9.1 The drawing shall show five (5) views of the vehicle: front, rear, both sides and top. Details shall include but not limited to: the overall dimensions of the apparatus, cab seating positions, proposed compartment sizes and features, hose bed configuration, booster tank position and the location of all emergency warning and work lights.

24.9.2 Detailed design and layout drawings, ANSI Engineering Drawing size “D”, 22” x 34”, or larger of both the right and left side pump panels shall be provided by the manufacturer for review by Freehold Township Fire District No. 2 before the pre-construction meeting. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing.

24.9.3 Drawings shall be submitted to Freehold Township Fire District No. 2 within thirty (30) days of contract signing.

24.9.4 Revised ANSI Engineering Drawing size “D”, 22” x 34” drawings shall be provided after the pre-construction conference and during the construction process whenever changes are made.

24.9.5 Freehold Township Fire District No. 2 and the manufacturer's sales representative responsible for the apparatus shall have copies of the original drawings and all revised drawings. The original drawings and all revised drawings shall become part of the final contract.

24.10 The following is a list of documentation required to be supplied by the apparatus manufacturer or their dealership representative to the Freehold Township Fire District No. 2 upon delivery of the completed apparatus. The documentation listed is mandatory

and the minimum that must be supplied with the apparatus. Any documentation not listed that is normally supplied by the successful bidder shall also be supplied.

24.10.1 Manufacturer's record of apparatus construction including the following:

A) Apparatus owner's name and address.

B) Apparatus manufacturer, apparatus model number, and apparatus serial number.

C) Chassis make, model and serial number.

D) Engine make, model, serial number, horse power rating, and governed speed.

E) Transmission make, model, and serial number, power take-off make, model and gear ratio.

F) Gear ratios for both rear axles.

G) Gross vehicle weight rating, gross axle weight rating – front, gross axle weight rating – rear.

H) Tire size and total rated capacity – front, tire size and total rated capacity – rear.

I) Electrical system voltage and alternator output in amps.

J) Battery make, model and capacity in cold cranking amps.

K) Fuel type and fuel tank capacity.

L) Maximum road speed.

M) Chassis weight distribution in pounds with manufacturer mounted equipment.

N) Apparatus weight documents from a certified scale showing actual loading on the front and rear axles, and of the overall apparatus. This weight shall be done will all fluid levels and tanks full but without personnel and equipment.

O) Paint manufacturer and paint color number(s).

24.10.2 Third party test certification(s) and test results of the apparatus, apparatus components, fixtures, or systems tested as required by the current edition of NFPA 1901Standard for Automotive Fire Apparatus.

24.10.3 Apparatus manufacturers test certification(s) and test results of the apparatus, apparatus components, fixtures, or systems tested as required by the current edition of NFPA 1901 Standard for Automotive Fire Apparatus.

24.10.4 Component or fixture certifications of compliance with NFPA 1901 requirements as required by the current edition of NFPA 1901 Standard for Automotive Fire Apparatus.

24.11 The apparatus manufacturer shall furnish the following manuals of the completed apparatus as delivered and accepted by Freehold Township Fire District No. 2.

24.11.1 Manuals will cover the inspection, operation and maintenance of the apparatus its components and systems including but not limited to:

A) Complete engine service manuals.

B) Transmission service manuals.

C) Meritor axel and brake manuals

D) Electrical generator manuals

E) Utility air compressor manual

E) Any other operation or service manuals normally supplied by the manufacturer or their component suppliers.

24.11.2 All information, schematics, charts detailed in the current edition of NFPA 1901 Standard for Automotive Fire Apparatus, Chapter 4, Sections 20.2.3 and 20.2.4 as applicable shall be furnished.

24.11.3 Two (2) copies of all manuals shall be provided, all books, manuals, schematics, charts and other printed material must be original printing. Photostats and or faxed copies are not acceptable.

A) Books, manuals, schematics, charts and other material may be furnished thumb drives, in this case two (2) thumb drives shall be provided.

25 Options

Proposed As:	
Spec.	Equal

25.1 The bidder shall provide pricing for the option(s) listed. Option pricing is for informational purposes and should not be part of the apparatus bid price. Option prices should be listed in the appropriate position on the Bid Proposal form.

25.1.1 Freehold Township Fire District No. 2 reserves the right to determine which, if any, of the options will be exercised.

25.2 Option # 1 – Left (street) side of the pump walkway stairs built as a tool compartment with the stairs lifting for access. Latch for stairs flush type, stairs held open by a single gas compressed shock absorber swing check. Compartment design to match right side walkway compartment detailed in section 16.1.2 A & B.

25.2.2 Compartment lit by one (1) On Scene Solutions 9” Access LED strip light in a ball burnished aluminum housing.

Freehold Township Fire District No. 2
Proposal

(TO BE FILLED OUT BY VENDOR)

The undersigned proposes to manufacturer and deliver a

Triple Combination Pumper

pursuant to the published specifications.

_____

Proposal Amount in Words

$_____

Proposal Amount in Numbers

_____ _____

Number of Days to Deliver in Words | Number of Days to Deliver in Numbers

_____ _____

Manufacturer Name | Federal I.D. Number

_____

Manufacturer Address

_____ _____

Signature of Authorized Agent | Name: Typed or Printed

_____ _____

Title | Date

_____ _____ _____

Telephone | Facsimile | E-Mail

Freehold Township Fire District No. 2
Proposal

(TO BE FILLED OUT BY VENDOR)

_____ $_____

Option # 1 Price in Words Option # 1 Price in Numbers

Fill out both pages in their entirety and place them as the first page or cover sheet in your bid submittal.