THE CORPORATION OF THE TOWN OF ERIN

Request For Proposal 2018-01FR

2018 4 DOOR CUSTOM CAB 1050 IGPM PUMPER/RESCUE

TOWN OF ERIN
5684 Trafalgar Road
Hillsburgh, Ontario
N0B 1Z0

FIRE DEPARTMENT
Tel: (519) 855-4407, Ext.243
Fax: (519) 855-4281
E-mail: fire@erin.ca

June 13, 2018

The Town of Erin invites you to submit a proposal for:

Supply and deliver a **2018 4 Door Custom Cab 1050 IGPM Pumper/Rescue**.

Prices are inclusive, with applicable HST shown separately. Proposals are due in clearly marked **"Request For Proposal 2018-01FR 2018 4 Door Custom Cab 1050 IGPM Pumper/Rescue"** envelopes or by e-mail, no later than **2:00 pm on July 20, 2018** at the following address:

Procurement Division
Town of Erin
5684 Trafalgar Road
Hillsburgh, ON N0B1Z0
RFP 2018-01FR

OR

procurement@erin.ca

Proposals received after the closing time will be rejected and returned unopened to the bidder. The Town of Erin reserves the right to dismiss any or all proposals at their sole discretion. The lowest proposal will not necessarily be accepted.

Proposal subject to Council approval.

For any further information, please contact the person named below.

J.M. Sawkins, CD, CFO, CFEI
Fire Chief
Town of Erin
(519) 855-4407 ext. 243
jim.sawkins@erin.ca

INFORMATION TO BIDDERS

Proposal Opening and Closing

All proposals must be received on or before **July 20, 2018 at 2:00 p.m.**, in order for a proposal to be received, it must be delivered by courier, in hand, by postal service or by e-mail, and received by an authorized representative of the Municipality at the indicated address and clearly marked as to contents.

Acceptance of Proposals

Unless otherwise specified in these proposal documents, it is agreed that this proposal constitutes an irrevocable offer to provide the goods and/or services described herein for a period of sixty (60) calendar days from the closing date for the receipt of proposals. Acceptance by the Corporation is effective upon approval by its awarding authority without communication or notice to the bidder, although such notice will, of course, be given as expeditiously as possible.

Rejection of Proposals

Proposals may be rejected for any one of the following reasons:

(a) Proposals received after the closing date.
(b) Proposals received on other than the proposal form supplied.
(c) Incomplete proposals (all items not bid).
(d) Qualified or conditional proposals.
(e) Proposals not properly signed and sealed

BIDDING REQUIREMENTS

Alteration or Withdrawal of Proposals

A proposal may be altered by submitting another proposal at any time up to the specified time and date for proposal closing. The last proposal received shall supersede and invalidate all proposals previously received by the Contractor for that contract.

The contractor may withdraw the proposal at any time up to the specified time and date for proposal closing by submitting a letter bearing the contractor's signature and seal and delivered to the Clerk of the Town of Erin. Such a submission must be received in sufficient time to be marked with the time and date of receipt.

Telegrams, fax transmissions and telephone calls will not be accepted.

Compliance with Applicable Laws

A condition of the Agreement is the requirement that the successful Proponent comply with all applicable laws of Ontario and Canada, including the Occupational Health and Safety Act (Ontario), the Ontario Human Rights Code, the Pay Equity Act (Ontario), the Accessibility for Ontarians with Disabilities Act (AODA) and applicable privacy statutes in the Province of Ontario.

RFP Documentation

This RFP consists of this document and any subsequent addenda (if issued).

Definitions

Unless otherwise specified in this RFP, capitalized words and phrases have their prescribed meaning as set out in the Agreement.

- **Agreement** means the Agreement that the successful Proponent enters into with the Town.
- **Conflict of Interest** includes, but is not limited to, any situation where:
  a) In relation to the RFP process, the Proponent has an unfair advantage or engages in conduct directly or indirectly, that may give it an unfair advantage, including but not limited to i) having or having access to information in the preparation of its Proposal that is confidential to the Town and not available to other proponents; ii) communicating with any person with a view to influencing preferred treatment in the RFP process; or iii) engaging in conduct that compromises or could be seen to compromise the integrity of the open and competitive RFP process and render that process non-competitive and unfair
  b) In relation to the performance of its contractual obligations in a Town contract, the Proponent's other commitments, relationships or financial interests i) could or could be seen to exercise an improper influence over the objective, unbiased and impartial exercise of its independent judgment; or ii) could or could be seen to compromise, impair or be incompatible with the effective performance of its contractual obligations.
- **Days** mean Business Days unless the term calendar days is specifically used.
- **Evaluation Team** means the individuals who have been selected by the Town to evaluate the Proposals, including, if deemed necessary, an oral presentation.
- **Municipality or Town** refers to the Town of Erin
- **Must** and **Shall** indicate a mandatory requirement that in the view of the Town must be substantially completed and complied with in order for a Proposal not to be rejected.
- **Prime Contractor** means a single Proponent that proposes to assume full contractual and financial liability for their participation. A prime contractor may or may not have sub-contractors.
- **Proponent** means the respondent to this RFP.

- **Proposal** means all the documentation submitted by the Proponent in response to the Request for Proposal, which has been accepted by the Town, in whole or in part. The terms "response" and "submission" are also used to mean Proposal.
- **Request for Proposal or RFP** means the Request for Proposal issued by the Town for goods or services and any addenda thereto.
- **Services** mean all services and deliverables to be provided by the Proponent to the Town.
- **Should** indicates a requirement that the Town would like the Proponent to address in its Proposal.
- **Subcontractor** means any Person having a contract with the Supplier for the performance of a part or parts of the Services.
- **Supplier** means the successful Proponent that has signed the Agreement.
- **Town Contact** means the person designated by the Town to be the contact person during the procurement process.

PROPOSAL REQUIREMENTS

The bidder having carefully examined, read and understood the Proposal requirements and specifications relating to this quote, we hereby offer to supply, complete as specified, one 2018 4 Door Custom Cab 1050 IGPM Pumper/Rescue.

Please specify anticipated delivery date: _____

PRICING

One (1) Pumper Fire Apparatus as outlined in these bid specifications:

Selling Price: $_____

Applicable Taxes: $_____

Total Proposal Price: $_____

LEASING OPTION

One (1) Pumper Fire Apparatus as outlined in these bid specifications:

Upfront Payment: $_____

Monthly Payments based on 3 year term: $_____

Monthly Payments based on 5 year term: $_____

End Term Amount Due: $_____

This proposal is submitted by _____
(Firm/Corporation)

Signing Officer's Name _____
(Please Print)

Signing Officer's Signature _____

Delivery of the completed vehicle shall be F.O.B. Town of Erin Fire Department within 180 to 240 calendar days after the acceptance of the order dependent on chassis delivery.

Note: Pricing provided shall be held firm for a maximum of thirty (30) calendar days.

GENERAL CONDITIONS

Intent

As per the specifications provided, each manufacturer is invited to submit pricing and delivery for one (1) Pumper/Tanker Fire Apparatus.

Bidders shall reply to the specifications on the forms supplied.

All items in these specifications must be answered indicating compliance or noncompliance. Bidders shall state "Yes" for compliance or state the deviation. Information relating to the deviation may accompany this document including a separate cover letter and shall state the page and section for ease of reference.

The specifications shall be answered on the forms. Other bid forms or the submission of alternates, not detailed in the specifications, shall be cause for disqualification.
It is the intent that the specifications clearly identify the furnishing and delivery of a complete Pumper/Rescue Fire Fighting Apparatus as specified.

Bids submitted will be reviewed and evaluated based on qualifications, bonding, quality programs, irregularities, delivery and price. The purchaser shall be the sole determining organization as to the award of the bid, and the lowest price may not necessarily be accepted.

Mandatory requirements are defined as follows. The Mandatory requirements as outlined in this document reflect the components required to manufacturer a high quality fire apparatus that will be in service for twenty years. The components required are of the highest quality and

are proven reliable to the fire service for 20 years. All these components are readily available to all manufacturers of fire apparatus. Components that are exclusive to one manufacturer will not be acceptable.

Demo/Stock Vehicle

A manufacturer may include a Demo/Stock vehicle as their submission or as an option/additional submission. Any Demo/Stock vehicle included as part of this proposal must clearly outline the discrepancies between the written proposal specifications and the Demo/Stock Vehicle specification. The manufacturer must also include a price list that covers those items that were in contrast to the original proposal specification. The manufacturer must also identify those items that cannot be added to the Demo/Stock specifications.

Workers Compensation Board Certification

The successful bidder must be certified and in good standing with the Workers Compensation Board. Proof of certification must be supplied with the bid. A manufacturer that is not certified or not in good standing with their local W.C.B. will be disqualified.

EVALUATION AND AWARD

Evaluation Criteria

Submitted proposals will be evaluated against criteria that will include:

1) Insurance Certificate for $25,000,000.00	25 points
2) Financial Fitness / will Supplier make statements available	10 points
3) ISO Certificate	5 points
4) Length of Time in Business / No prototypes	5 points
5) Professional Engineering Certificate of Staff Member	5 points
6) C.W.B. Welding Certificates	15 points
7) Fire Apparatus Manufacture Association Certificate	5 points
8) References	15 points
9) 24 Hour Warranty Policy/ Service within 100 Miles	10 points
10) Tender Meets Specs	30 points
11) Body & Paint Warranty Certificates	30 points
12) Price	10 points
Total	**165 points**

Demonstration

An authorized representative of the manufacturer shall provide demonstration of the completed vehicle. One (1) day of orientation shall be provided and performed by a qualified representative of the manufacturer.

Terms and Conditions of Payment

The chassis shall be paid in full when it is received at the apparatus manufacturer's facilities for purchase option or the specified lease upfront payment.

The balance of payment shall be paid upon completion and delivery acceptance or in accordance with the leasing program.

Qualification Sheet

All bidders must fill this form out completely. (Mandatory requirement)

REQUIREMENTS

1) The bidder must have been manufacturing fire apparatus continuously, without interruption for a minimum of five (5) years.

2) The vehicle proposed must not be a prototype.

3) How long has the proposed vehicle been in production?

Number of Years _____

4) The bidder shall have in place, a documented and certified ISO 9001 quality program in place. A copy of the certification must be included with the bid submittal.

5) The bidder shall have a quality manual available for inspection by the purchaser.

6) The bidder shall have an audited financial statement available that indicates stability and the ability to manufacture the vehicle along with providing warranty and service in the long term.

7) The bidder must indicate that they are the prime contractor for this bid, and that all non-purchased components are not subcontracted.

8) All welding must be performed by certified welders. Copies of the certification must be attached with the bid submittal.

9) All welding on the plumbing systems must be performed by certified welders. Copies of the certification must be attached with the bid submittal.

10) The apparatus manufacturer must be certified by the Fire Apparatus Manufacturers Association (FAMA). A copy of the certificate must be attached with the bid submittal.

11) The apparatus manufacturer must provide documentation of having a certified engineer on staff with the bid submittal.

12) The manufacturer of the apparatus must supply a Certificate of Insurance proving that they carry a minimum of $25,000,000.00 in product liability insurance. Bids not meeting this requirement will not be accepted. A copy of the certificate shall be included with the bid submittal.

13) The manufacturer of the apparatus must be registered with Transport Canada to the National Safety Mark Standard. Bids not meeting this requirement will not be accepted. Copies or registration must be attached with the bid submittal.

14) The apparatus body warranty shall be 20 years against manufacturer's defects, 20 years body corrosion and material perforation. Copy of the warranty certificates shall be included with the submittal.

15) The paint warranty on the enclosed canopy, pump house, apparatus body shall be a full 10 years non- prorated. A copy of the paint warranty shall be included with the submittal.

16) Customer reference list. Provide a list of ten (10) references. Reference list shall be included with the submittal

Specifications	Yes	No	Exceptions
SERVICE REQUIREMENTS The bidder shall provide a "24 Hour", "7-Day Per Week" emergency parts and service toll free telephone number. This phone number must be listed on a separate statement included in the bid package, along with the contact name, business name, address, and phone number of the local service agency, which will service the vehicle after being placed into service. The service agency shall be capable to perform all required service work, and shall also have at their disposal the ability to have any required subcontracting work, such as engine, transmission, etc. work performed on behalf of the apparatus manufacturer. **TESTING AND CERTIFICATION** The completed vehicle shall be tested and labeled to N.F.P.A. 1901 standards, 2009 edition by an independent third party certification organization. The third party organization shall be accredited for testing systems on fire apparatus in accordance with ISO/IEC 17020 or ISO/IEC Guide 65. The certification organization shall not be owned or controlled by manufacturers or vendors of the apparatus being tested. The certification organization shall be primarily engaged in certification work and shall not have a monetary interest in the product's ultimate profitability. The certification organization shall witness all test and shall refuse to certify any test result for a system if the components do not pass the testing required by this system. There shall be no conditional, temporary, or partial certification of test results. Appropriate forms of data sheets shall be provided and used during testing.			

Manufacturer's certification is not acceptable. (No exceptions) The manufacturer shall be certified to ISO 9001 The completed vehicle shall undergo, prior to delivery, a two (2) hour road test with all applicable emergency equipment activated. A certification shall be provided to the purchaser outlining the results of this road test. **CARRYING CAPACITY PLATE** A warning label shall be provided in the cab within sight of the driver stating the seating capacity of the cab/crew cab. Another warning label shall be provided in the cab within sight of the driver that the occupants must be seated and belted. **VEHICLE DIMENSION PLATE** A warning label shall be provided in the cab within sight of the driver stating the following apparatus dimensions. Height and length in standard and metric measurements. Gross vehicle weight rating in pounds and kilograms. **PRIMING SYSTEM LABEL** The priming system shall be marked with a label to indicate proper operation. **PUMP OPERATION WARNING LABEL** There shall be a warning label mounted on the pump operator's panel that states the following: "Warning": Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations." **DIELECTRIC VOLTAGE TESTING** The wiring and permanently connected devices and equipment shall be subject to a dielectric voltage withstand test of 900 volts			

for one minute. The testing shall be performed after all body work has been completed. The electric polarity of all permanently wired equipment, cord reels, and receptacles shall be tested to verify that wiring connections have been properly made. **FLUID CAPACITY AND TYPE LABEL** A permanent label shall be provided and shall state the type and quantity of the following fluids used in the vehicle: Engine Oil Engine Coolant Chassis Transmission Fluid Drive Axle Fluid Pump Gear Case Primer Lubricant (If Applicable) **ENGINEERING DRAWINGS** Engineering drawings shall be submitted to the purchaser prior to commencement of the manufacturing process. These drawings shall show at a minimum the front, left, right and rear views of the vehicle, as it will look at the time of completion. A copy of the drawings shall be signed and returned to the apparatus manufacturer and become part of the vehicle contract. **BODY MANUAL - CD** One (1) compact disc manual(s) shall be provided on operation of the complete apparatus. The CD manual(s) shall include a troubleshooting guide complete with recommended daily, weekly and annual maintenance procedures.			

The apparatus manufacturer shall supply a complete wiring diagram for the color coded wiring harness. **CHASSIS SPECIFICATIONS** A custom Spartan four door chassis shall be supplied as per the attached specifications. **MODEL** The chassis shall be a Metro Star model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time. **MODEL YEAR** The chassis shall have a vehicle identification number that reflects a 2018 or newer model year. **COUNTRY OF SERVICE** The chassis shall be put in service in the country of Canada (CAN). The chassis will meet applicable Canadian Technical Standards Document per Canadian Motor Vehicle Safety Regulations as clarified in the incomplete vehicle document which accompanies each chassis. Spartan Chassis is not responsible for compliance to provincial, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan chassis or their OEM needed to be ibn compliance with those regulations. **ADDITIONAL VOCATIONAL STANDARD** The cab, chassis and components shall be audited to Underwriter's Laboratories of Canada (ULC) current published apparatus specification ULC S-515. The global chassis compliance certification shall be provided to the manufacturer.			

The chassis as specified shall meet applicable criteria of ULC S-515 and shall include the ULC marking. **CAB AND CHASSIS LABELING LANGUAGE** The cab and chassis shall include the applicable caution, warning, and safety notice labels written in both English and French. **APPARATUS TYPE** The apparatus shall be a pumper/rescue vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 1050 IGPM (5000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires, while maximizing compartment storage capacity. **VEHICLE TYPE** The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer. **AXLE CONFIGURATION** The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle. **GROSS AXLE WEIGHT RATINGS FRONT** The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds. This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.			

GROSS AXLE WEIGHT RATINGS REAR The rear gross axle weight rating (GAWR) of the chassis shall be 27,000 pounds. This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel. **PUMP PROVISION** The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted out of road mode while the transmission is in neutral. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally. **WATER & FOAM TANK CAPACITY** The chassis shall include a carrying capacity of 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer. **CAB STYLE** The cab shall be a custom, fully enclosed, MFD model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions. The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a			

superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction. The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum. All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention. The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick. The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 131.10 inches with 54.00 inches from the centerline of the front of the axle to the back of the cab. The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab. The cab shall offer an interior height of 57.50 inches from the front floor to the headliner in the non-raised roof area and a rear floor to headliner height of 65.00 inches in the raised roof area, at			

a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 51.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface. The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening. The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely. The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches. The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.			

OCCUPANT PROTECTION The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. The system components shall include: • Driver steering wheel airbag • Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag. • Large driver, officer, and crew area side curtain airbags • APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries • Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event • Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM • Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent			

pending), officer side knee airbag, and advanced seat belts for each occupant in the cab. Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring. In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors. **CAB FRONT FASCIA** The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab. The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the “Classic” design. The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps. **FRONT GRILLE** The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.			

CAB UNDERCOAT There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection. **CAB SIDE DRIP RAIL** There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side. **CAB PAINT EXTERIOR** The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces. All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils. The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer. The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked			

at 180 degrees for one (1) hour to speed the curing process of the coatings. **CAB PAINT MANUFACTURER** The cab shall be painted with PPG Industries paint. **CAB PAINT PRIMARY/LOWER COLOR** The lower paint color shall be PPG FBCH 911662 Red. **CAB PAINT SECONDARY/UPPER COLOR** The secondary/upper paint color shall be PPG FBCH 910788 black. **CAB PAINT EXTERIOR BREAKLINE** The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. The breakline shall curve down at the front cab corners to approximately 5.00 inches below the windshields on the front of the cab. **CAB PAINT PINSTRIPE** Where the upper and lower paint colors meet a temporary 0.50 inch wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM. **CAB PAINT WARRANTY** The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first. **CAB PAINT INTERIOR** The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.			

CAB ENTRY DOORS The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate. The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit. All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel. **CAB ENTRY DOOR TYPE** All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation. **CAB INSULATION** The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior. **CAB STRUCTURAL WARRANTY** Summary of Warranty Terms: THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.			

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user. **CAB TEST INFORMATION** The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5. The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request. **ELECTRICAL SYSTEM** The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof. **MULTIPLEX DISPLAY** The multiplex electrical system shall include a Weldon Vista IV Touchscreen display which shall be located on the left side of the dash in the switch panel. The Touchscreen display shall feature a full color LCD screen. The display shall include a message bar displaying the time of day, and important messages requiring			

acknowledgement by the user. There shall be virtual controls for the on-board diagnostics. The display screen shall be video ready for back- up cameras, thermal cameras, and DVD. A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display. The Touchscreen display shall measure approximately 6.25 inches wide x 3.38 inches in height. The display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options. **LOAD MANAGEMENT SYSTEM** The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed. **DATA RECORDING SYSTEM** The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded: • Vehicle Speed • Acceleration • Deceleration • Engine Speed • Engine Throttle Position • ABS Event • Seat Occupied Status • Seat Belt Status • Master Optical Warning Device Switch Position • Time • Date Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.			

ACCESSORY POWER The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 150 amp master switched and manually resettable breaker protected power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections. **AUXILIARY ACCESSORY POWER** An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 60 amp breaker. The studs shall be 0.38 inch diameter and capable of carrying up to a 60 amp load switched with the master power switch. **EXTERIOR ELECTRICAL TERMINAL COATING** All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion. **ENGINE** The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 380 horse power at 2000 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1150 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement. The L9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2017 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.			

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication. A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab. **CAB ENGINE TUNNEL** The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high. **DIESEL PARTICULATE FILTER CONTROLS** There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit. **ENGINE PROGRAMMING HIGH IDLE SPEED** The engine high idle control shall maintain the engine idle at approximately 1150 RPM when engaged. **ENGINE HIGH IDLE CONTROL** The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed			

in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control. **ENGINE PROGRAMMING ROAD SPEED GOVERNOR** The engine shall include programming which will govern the top speed of the vehicle. **AUXILIARY ENGINE BRAKE** The engine shall utilize a variable geometry turbo (VGT). The VGT auxiliary engine brake shall be an integral part of the turbo and shall offer a variable rate of exhaust flow, which when activated shall slow the engine and in turn slow the vehicle. The VGT shall actuate the vehicle's brake lights when engaged as an auxiliary brake. A cutout relay shall be installed to disable the VGT when in pump mode or when an ABS event occurs. The VGT engine brake shall activate at a 0% accelerator throttle position when in operation mode. **AUXILIARY ENGINE BRAKE CONTROL** An engine variable geometry turbo brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected: • A valid gear ratio is detected. • The driver has requested or enabled engine compression brake operation. • The throttle is at a minimum engine speed position. • The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. The variable geometry turbo brake shall be controlled via a virtual button on the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.			

ELECTRONIC ENGINE OIL LEVEL INDICATOR The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running. **FLUID FILLS** The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step. **ENGINE DRAIN PLUG** The engine shall include an original equipment manufacturer installed oil drain plug. **ENGINE BLOCK HEATER** A Kim Hotstart 1000 watt, 120 volt engine coolant heater with automatic thermostat shall be installed. **ENGINE WARRANTY** The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first. **REMOTE THROTTLE HARNESS** An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a			

pump control switch, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set. **ENGINE PROGRAMMING REMOTE THROTTLE** The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required. **ENGINE PROGRAMMING IDLE SPEED** The engine low idle speed will be programmed at 700 rpm. **ENGINE FAN DRIVE** The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive. The fan shall be installed on the engine and shall include an air directive shroud. A virtual button on the Vista display and control screen shall be provided to turn the fan clutch on and off manually. The virtual button shall not function to turn off the fan when the fan is activated due to high coolant temperature. When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. **ENGINE COOLING SYSTEM** There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The			

cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores. The cooling system shall utilize a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, an air to air charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing. The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability. The cooling system shall include a one piece injection molded polymer fan with a three (3) piece fiberglass fan shroud. The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber. All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.			

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer’s requirements. The radiator and charge air cooler shall be removable through the bottom of the chassis. **ENGINE COOLING SYSTEM PROTECTION** The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components. **ENGINE COOLANT** The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit. Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup. **ELECTRONIC COOLANT LEVEL INDICATOR** The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident. **ENGINE PUMP HEAT EXCHANGER** A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump			

from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine. **COOLANT HOSES** The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps. **ENGINE COOLANT OVERFLOW BOTTLE** A remote engine coolant overflow bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground. The overflow bottle provided on the cooling system shall only be a catch bottle and shall not return excess coolant back into the surge tank. **ENGINE AIR INTAKE** The engine air intake system shall include an ember separator air intake filter which shall be located behind the right hand side headlamp. This filter ember separator shall be designed to protect the downstream air filter from embers, using a combination of unique flat and crimped metal screens packaged in a corrosion resistant heavy duty galvanized steel frame. This multilayered screen shall be design traps embers and allows them to burn out before passing through the pack. The engine air intake system shall also include a stainless steel air cleaner mounted to the frame and located beneath the cab on the right side of the vehicle. The air cleaner shall utilize a replaceable filter element designed to prevent dust and debris from being ingested into the engine. The air cleaner housing and connections in the air intake system shall be designed to mitigate water intrusion into the system during severe weather conditions.			

The air intake system shall also include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement. **AIR INTAKE PROTECTION** A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components. **ENGINE EXHAUST SYSTEM** The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the between the DPF and SCR. The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF. The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires. The exhaust system after treatment module shall be mounted below the frame in the outboard position. **DIESEL EXHAUST FLUID TANK** The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall			

have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame. The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen. The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step. **ENGINE EXHAUST ACCESSORIES** An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet. **ENGINE EXHAUST WRAP** The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust. **TRANSMISSION** The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing. The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.			

The transmission gear ratios shall be: 1st 3.49:1 2nd 1.86:1 3rd 1.41:1 4th 1.00:1 5th 0.75:1 6th 0.65:1 (if applicable) Rev 5.03:1 **TRANSMISSION MODE PROGRAMMING** The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth and sixth speeds shall be programmed as over drive speeds and shall be available with the activation of the mode button on the shifting pad. **TRANSMISSION FEATURE PROGRAMMING** The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override. This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.			

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	**Description**	**Wire assignment**
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle. **TRANSMISSION COOLING SYSTEM** The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling. **TRANSMISSION DRAIN PLUG** The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug. **TRANSMISSION WARRANTY** The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty. **PTO LOCATION** The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 4:00 o'clock position. **DRIVELINE** All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.			

MIDSHIP PUMP / GEARBOX A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer. **MIDSHIP PUMP / GEARBOX MODEL** The midship pump/gearbox provisions shall be for a Hale DSD forward pump. **MIDSHIP PUMP GEARBOX DROP** The Hale pump gearbox shall have an "X" (extra long) drop length. **MIDSHIP PUMP RATIO** The ratio for the midship pump shall be 2.32:1 (23). **MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE** The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 98.00 inches. **PUMP SHIFT CONTROLS** One (1) pump shift control panel shall be mounted on the driver's dash panel. The following shall be provided on the panel: a three (3) position locking toggle switch; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline. One (1) label indicating pump instructions and the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the switch is in the up position and pump mode shall be selected when the switch is in the down position. The center switch position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.			

PUMP SHIFT CONTROL PLUMBING Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system. **FUEL FILTER/WATER SEPARATOR** The fuel system shall have a Fleetguard FS1098 fuel filter/water separator with a thermostatically controlled integral heater as a primary filter. The fuel filter shall have a drain valve. An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included. A secondary fuel filter shall be included as approved by the engine manufacturer. **FUEL LINES** The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass fittings. **ELECTRIC FUEL PRIMER** Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming. **FUEL TANK** The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length.			

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw. The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank. The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable. **FUEL TANK MATERIAL AND FINISH** The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components. All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum. Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.			

FUEL TANK STRAP MATERIAL The fuel tank straps shall be constructed of ASTM A-36 steel. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible. **FUEL TANK FILL PORT** The fuel tank fill ports shall be in-line with the left and right side fill ports located in the forward position of the fuel tank. **FUEL TANK SERVICEABILTY PROVISIONS** The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis. **FUEL TANK DRAIN PLUG** A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank. **FRONT AXLE** The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. **FRONT AXLE WARRANTY** The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option. **FRONT WHEEL BEARING LUBRICATION** The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.			

FRONT SHOCK ABSORBERS Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life. The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would. The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers. Proposals offering the use of conventional twin tube or "road sensing" designed shocks shall not be considered. **FRONT SUSPENSION** The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds. **STEERING COLUMN/ WHEEL** The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel			

located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding. The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch. **ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR** The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal. **POWER STEERING PUMP** The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler. **FRONT AXLE CRAMP ANGLE** The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right. **POWER STEERING GEAR** The power steering gear shall be a TRW model TAS 65 with an assist cylinder. **CHASSIS ALIGNMENT** The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer. **REAR AXLE** The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction			

differential gearing, and shall have a fire service rated capacity of 27,000 pounds. The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance. The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used. **REAR AXLE DIFFERENTIAL LUBRICATION** The rear axle differential shall be lubricated with synthetic oil. **REAR AXLE WARRANTY** The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option. **REAR WHEEL BEARING LUBRICATION** The rear axle wheel bearings shall be lubricated with synthetic oil. **VEHICLE TOP SPEED** The top speed of the vehicle shall be approximately 75 MPH +/-2 MPH at governed engine RPM.			

REAR SUSPENSION The single rear axle shall feature a Hendrickson Firemaax™ air suspension. The suspension shall include two optimized air springs mounted to cast structural trailing arms, a transverse cross beam for increased roll stability and two heavy duty shock absorbers. Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load. Axle alignment is maintained using two eccentric bushings at each frame bracket. The rear suspension capacity shall be rated at 27,000 pounds. **REAR SHOCK ABSORBERS** Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension. **SUSPENSION CONTROLS** The rear suspension shall incorporate a kneeling feature which, when activated, will deplete the air in the air bag to lower the rear of the chassis. The kneeling system shall include a button on the Vista display and control screen to control the rear kneeling feature. The system shall include a park brake interlock and an instrument panel mounted red indicator lamp, which shall illuminate when the system is activated. **FRONT TIRE** The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread. The front tire stamped load capacity shall be 22,800 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating maximum load capacity shall be 24,396 pounds per axle with a maximum speed of 65			

miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating maximum speed capacity shall be 22,800 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel. **REAR TIRE** The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather tread. The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.			

REAR AXLE RATIO The rear axle ratio shall be 4.89:1. **TIRE PRESSURE INDICATOR** There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation. **FRONT WHEEL** The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water. **REAR WHEEL** The outer rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with a LvL One™ bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. **BALANCE WHEELS AND TIRES** All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.			

WHEEL TRIM The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable. The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder. The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification. **WHEEL GUARDS** The rear dual wheels shall include a plastic isolator approximately 0.04" installed between the inner and outer wheel hub to help prevent corrosion caused by metal to metal contact. There shall also be a plastic isolator between the axle hub and the wheels on both front and rear axles. **BRAKE SYSTEM** A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a controlled service brake application during the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification. The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.			

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards. Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces. The ATC light shall illuminate during excessive wheel slip and ATC is operational. A virtual style switch shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature. **FRONT BRAKES** The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors. **REAR BRAKES** The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.			

PARK BRAKE Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements. **PARK BRAKE CONTROL** A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake. The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver. **AIR DRYER** The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side. **FRONT BRAKE CHAMBERS** The front brakes shall be provided with MGM type 24 long stroke brake chambers. **REAR BRAKE CHAMBERS** The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.			

AIR COMPRESSOR The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life. **AIR GOVERNOR** An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box. **MOISTURE EJECTORS** A heated, automatic moisture ejector with a manual cable actuated drain provision shall be installed on the wet tank of the air supply system. Manual cable actuated drain valves shall be installed on all remaining reservoirs of the air supply system. The actuation pull cables shall be coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus. **AIR SUPPLY LINES** The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.			

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses. **WHEELBASE** The chassis wheelbase shall be 183.00 inches. **REAR OVERHANG** The chassis rear overhang shall be 51.00 inches. **FRAME** The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width. Proposals calculating the frame strength using the “box method” shall not be considered. Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail. A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick			

gusset reinforcement plates at all corners balancing the area of force throughout the entire frame. Any proposals not including additional reinforcement for each cross member shall not be considered. All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point. The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request. Proposals offering warranties for frames not including cross members shall not be considered. **FRAME WARRANTY** Summary of Warranty Terms: THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT. The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user. **FRAME CLEAR AREA** The chassis frame shall be left clear of chassis mounted components inside and outside the frame rails within the first 44.00 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.			

FRAME PAINT The frame shall be powder coated black prior to any attachment of components. All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils. Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above. The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted with gloss black paint. Paint shall be applied prior to airline and electrical wiring installation. **FRONT BUMPER** A one piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12.00 inches high and 99.00 inches wide. **FRONT BUMPER EXTENSION LENGTH** The front bumper shall be extended approximately 18.00 inches ahead of the cab. **AIR HORN** The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome			

finish on the exterior and a painted finish deep inside the trumpet. **AIR HORN LOCATION** The air horns shall be recess mounted in the front bumper face on the left side of the bumper in the inboard and outboard positions relative to the left hand frame rail. **AIR HORN RESERVOIR** One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system. **ELECTRONIC SIREN SPEAKER** There shall be one (1) Whelen Engineering Inc. model SP123BMC, 100 watt cast aluminum speaker provided. The speaker shall measure 7.25 inches tall X 9.25 inches wide X 5.25 inches deep. The speaker shall include a chrome grille. **ELECTRONIC SIREN SPEAKER LOCATION** The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the inboard position. **FRONT BUMPER TOW HOOKS** Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed in the rearward position out of the approach angle area, bolted directly to the side of each chassis frame rail with grade 8 bolts. **CAB TILT SYSTEM** The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and			

transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box. The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation. It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit. Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks. Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs. A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab. **CAB TILT AUXILIARY PUMP** A manual cab tilt pump module shall be attached to the cab tilt pump housing. **CAB TILT CONTROL RECEPTACLE** The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control			

pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap. The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis. **CAB TILT LOCK DOWN INDICATOR** The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts. In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar with the parking brake released. **CAB WINDSHIELD** The cab windshield shall have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility. The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs. Each windshield shall be installed using black self locking window rubber. **GLASS FRONT DOOR** The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.			

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as “cozy glass” ahead of the front door roll down windows. The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior. **GLASS TINT FRONT DOOR** The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance. **GLASS REAR DOOR RH** The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use. **GLASS TINT REAR DOOR RIGHT HAND** The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance. **GLASS REAR DOOR LH** The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use. **GLASS TINT REAR DOOR LEFT HAND** The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.			

GLASS SIDE MID RH The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted. **GLASS TINT SIDE MID RIGHT HAND** The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance. **GLASS SIDE MID LH** The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted. **GLASS TINT SIDE MID LEFT HAND** The window located on the left hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance. **CLIMATE CONTROL** The cab shall include a front under dash heater/defroster. The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering			

three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab. The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-quip EZ clip fittings. **CLIMATE CONTROL DRAIN** The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance. **CLIMATE CONTROL ACTIVATION** The defrosting controls shall be located on the lower left portion of the center dash panel, within easy reach of the driver. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit. **AUXILIARY CLIMATE CONTROL FRONT UNDERSEAT** Two (2) 13,500 BTU heaters shall be provided and installed in the face of the seat riser storage area for the left and right front seats, one (1) each side. The fan controls shall be located on the Vista display and control screen(s). The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.			

AUXILIARY CLIMATE CONTROL REAR CREW One (1) 53,500 BTU heater shall be provided and installed in the rear section of the crew cab under the center forward facing seat riser. The fan controls shall be located on the heater unit. The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve. **HEATER HOSE INSULATION** The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heater hoses which shall be routed inside the cab shall not be insulated. **A/C CONDENSER LOCATION** A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise. **A/C COMPRESSOR** The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil. **CAB CIRCULATION FANS FRONT** The cab shall include two (2) all metal 6.00 inch air circulation fans installed on the center section of the ABS HVAC cover rearward of the windshield. Each fan shall be controlled by an individual virtual button on the Vista display and control screen or a toggle switch on each fan. The fans shall automatically activate whenever the HVAC is in defrost mode. The fans can be			

used to help defog the windshield or to increase air circulation for passenger comfort. **UNDER CAB INSULATION** The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments. The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior. The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test. The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. **INTERIOR TRIM FLOOR** The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.			

INTERIOR TRIM The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing. **REAR WALL INTERIOR TRIM** The rear wall of the cab shall be trimmed with vinyl. **HEADER TRIM** The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum. **TRIM CENTER DASH** The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate and include provisions for the front under dash heater defroster. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. **TRIM LH DASH** The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels. The left hand dash shall also include provisions for the front under dash heater defroster. **TRIM RH DASH** The right hand dash trim shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include provisions for the front under dash heater defroster.			

ENGINE TUNNEL TRIM The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance. **POWER POINT DASH MOUNT** The cab shall include one (1) 12 volt cigarette lighter type receptacles in the cab dash to provide a power source for 12 volt electrical equipment. The receptacles shall be wired battery direct. The cab shall also include one (1) Dual universal serial bus (USB) charging receptacles in the cab dash rocker switch cutout to provide a power source for USB chargeable electrical equipment. Each USB receptacle shall include one (1) USB port capable of a 5 Volt-1 amp output and one (1) USB port capable of a 5 Volt-2.1 amp output. The receptacles shall be wired battery direct and include a backlit legend. **STEP TRIM** Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of polished 5032 H32 aluminum Grip Strut® grating with angled outer corners. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have an opening on the outer edge to allow debris and water to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred® adhesive grit surface material.			

UNDER CAB ACCESS DOOR The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill. **INTERIOR DOOR TRIM** The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish. **DOOR TRIM CUSTOMER NAMEPLATE** The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department. **CAB DOOR TRIM REFLECTIVE** The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a waving Canadian Flag logo. The chevron tape shall measure 6.00 inches in height. **INTERIOR GRAB HANDLE "A" PILLAR** There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.			

INTERIOR GRAB HANDLE FRONT DOOR Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab. **INTERIOR GRAB HANDLE REAR DOOR** A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab. **INTERIOR SOFT TRIM COLOR** The cab interior soft trim surfaces shall be gray in color. **INTERIOR TRIM SUNVISOR** The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim. **INTERIOR FLOOR MAT COLOR** The cab interior floor mat shall be gray in color. **CAB PAINT INTERIOR DOOR TRIM** The inner door panel surfaces shall be painted with multi-tone silver gray texture finish. **HEADER TRIM INTERIOR PAINT** The metal surfaces in the header area shall be coated with multi-tone silver gray texture finish.			

TRIM CENTER DASH INTERIOR PAINT The entire center dash shall be coated with multi-tone silver gray texture finish. Any accessory pods attached to the dash shall also be painted this color. **TRIM LH DASH INTERIOR PAINT** The left hand dash shall be painted with a multi-tone silver gray texture finish. **TRIM RIGHT HAND DASH INTERIOR PAINT** The right hand dash shall be painted with multi-tone silver gray texture finish. **DASH PANEL GROUP** The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer. **SWITCHES CENTER PANEL** The center dash panel shall include no rocker switches or legends. **SWITCHES LEFT PANEL** The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided. **SWITCHES RIGHT PANEL** The right dash panel shall include three (3) rocker switch positions in the upper left hand portion of the panel. A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each			

blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided. **SEAT BELT WARNING** A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s), an indicator light in the instrument panel, and an audible alarm. The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened. **SEAT MATERIAL** The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear. **SEAT COLOR** All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts. **SEAT BACK LOGO** The seat back shall include the “Spartan” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.			

SEAT DRIVER The driver's seat shall be an H.O. Bostrom 400 Series Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock. The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant. The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel. This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles. **SEAT BACK DRIVER** The driver’s seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.			

SEAT MOUNTING DRIVER The driver's seat shall be installed in an ergonomic position in relation to the cab dash. **OCCUPANT PROTECTION DRIVER** The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. The driver's seating area APS shall include: • Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. • Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door. • Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be shall be slowed by the load limiting seat belt. • Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision. **SEAT OFFICER** The officer's seat shall be an H.O. Bostrom 400 Series Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment			

with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock. The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant. The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel. This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles. **SEAT BACK OFFICER** The officer's seat shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.			

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.** The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment. The seat back shall include a removable padded cover which shall be provided over the SCBA cavity. **SEAT MOUNTING OFFICER** The officer's seat shall be installed in an ergonomic position in relation to the cab dash. **OCCUPANT PROTECTION OFFICER** The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. The officer's seating area APS shall include: • Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.			

• Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door. • Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt. **SEAT BELT ORIENTATION CREW** The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip. **SEAT REAR FACING OUTER LOCATION** The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat. **SEAT CREW REAR FACING OUTER** The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom 400 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be spring load hinged and compact in design for additional room and shall remain in the stored position until occupied. The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.			

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches. This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles. **SEAT BACK REAR FACING OUTER** The rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool. The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.** The bracket system shall be free of straps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once			

the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment. The seat back shall include a removable padded cover which shall be provided over the SCBA cavity. **SEAT MOUNTING REAR FACING OUTER** The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats. **OCCUPANT PROTECTION RFO** The rear facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. Each rear facing outer seating position APS shall include: • APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. • Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.			

SEAT FORWARD FACING CENTER LOCATION The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall. **SEAT CREW FORWARD FACING CENTER** The crew area shall include a seat in the forward facing center position which shall be a H.O. Bostrom 400 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches. This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.			

SEAT BACK FORWARD FACING CENTER The forward facing center seat shall feature a SecureAll™ self contained breathing apparatus (SCBA) locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool. The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.** The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment. The seat back shall include a removable padded cover which shall be provided over the SCBA cavity. **OCCUPANT PROTECTION FFC** The forward facing center seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.			

Each forward facing center seating position APS shall include: • APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. • Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration. **SEAT FRAME FORWARD FACING** The forward facing center seating positions shall include an enclosed seat frame located and installed on the rear wall. The seat frame shall measure 42.38 inches wide X 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior. **SEAT FRAME FORWARD FACING STORAGE ACCESS** The seat frame shall include a forward facing vent which shall allow air to flow through from the underseat climate control unit. **SEAT MOUNTING FORWARD FACING CENTER** The forward facing center seats shall be installed facing the front of the cab. **CAB FRONT UNDERSEAT STORAGE ACCESS** The left and right under seat storage areas shall have a vented aluminum hinged door with non-locking latch.			

SEAT COMPARTMENT DOOR FINISH All underseat storage compartment access doors shall have a multi-tone silver gray texture finish. **HELMET STORAGE FRONT LOCATION** The front cab area shall include two (2) helmet storage brackets located overhead on the right and left hand sides of the cab. **HELMET STORAGE FRONT** The front cab area shall include Ziamatic model UHH-1 helmet storage bracket designed to meet current NFPA regulations. The UHH-1 shall securely fasten fire helmets to flat cab surfaces. The UHH-1 utilizes a helmet hook and an adjustable strap to accommodate nearly any helmet size or configuration. **HELMET STORAGE REAR CREW OUTER LOCATION** The outboard rear crew area of the cab shall include four (4) helmet storage brackets. The brackets shall be located on the middle outboard section on both the right and left of the rear wall. They shall be placed one above the other. **HELMET STORAGE REAR CREW OUTER** The rear outer crew area shall include Ziamatic model UHH-1 helmet storage designed to meet current NFPA regulations. The UHH-1 shall securely fasten fire helmets to flat cab surfaces. The UHH-1 utilizes a helmet hook and an adjustable strap to accommodate nearly any helmet size or configuration. **WINDSHIELD WIPER SYSTEM** The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The			

wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position. **ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR** The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message. **CAB DOOR HARDWARE** The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish. The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel. All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout. The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish. **DOOR LOCKS** Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out. **GRAB HANDLES** The cab shall include one (1) 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab			

handle shall be made of SAE 304 stainless steel and be 1.25 inch diameter to enable non-slip assistance with a gloved hand. **REARVIEW MIRRORS** Retrac Aerodynamic West Coast style dual vision mirror heads model 613315 shall be provided and installed each of the front cab doors. The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce vibration. The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an integral convex mirror in the mirror head below the flat glass to provide wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions. The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass. **REARVIEW MIRROR HEAT SWITCH** The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen. **TRIM LOWER SIDE** A stainless steel trim band, 10.00 inches high, with upper and lower black and chrome trim moldings, shall be installed on the lower exterior sides of the cab and doors. The trim shall be installed so that the top edge approximately 1.00 inch below the top of the front bumper, and shall be affixed without holes and fasteners.			

TRIM LOWER SIDE FRONT A stainless steel trim band, 10.00 inches high, with upper and lower black and chrome trim moldings, shall be installed on the lower exterior sides of the cab between the front bumper and the front doors. The trim shall be installed so that the top edge is approximately 1.00 inch below the top of the front bumper, and shall be affixed without holes and fasteners. **EXTERIOR TRIM REAR CORNER** There shall be an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick on the outside corners at the back of the cab. The overlay shall wrap 1.00 inches forward on the sides of the cab and 12.00 inches inboard on the rear wall. **CAB FENDER** Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 5.00 inches wide made of polished aluminum. **MUD FLAPS FRONT** The front wheel wells shall have mud flaps installed on them. **CAB EXTERIOR FRONT & SIDE EMBLEMS** The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides. The cab shall also include one (1) Advanced Protection System shield emblem on each front door. **IGNITION** A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter			

button shall be provided adjacent to the master battery and ignition switches. Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position. The starter button shall only operate when both the master battery and ignition switches are in the “ON” position. **BATTERY** The single start electrical system shall include three (3) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. **BATTERY TRAY** The batteries shall be installed on a steel battery tray located on the left side of the chassis, securely bolted to the frame rails. The battery tray shall be coated with the same material as the frame. The battery tray shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the tray to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards. **BATTERY BOX COVER** The battery box shall include a steel cover which protects the top of the batteries on the left hand side of the vehicle. The cover shall be coated the same as the frame and shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening. **BATTERY CABLE** The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.			

BATTERY JUMPER STUD The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure. **ALTERNATOR** The charging system shall include a 270 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator. **STARTER MOTOR** The single start electrical system shall include a Delco brand starter motor. **BATTERY CONDITIONER** A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position. **BATTERY CONDITIONER DISPLAY** A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the left front door. **ELECTRICAL INLET** A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.			

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to. ***Amp Draw Reference List:*** *Kussmaul 1000 Charger - 3.5 Amps* *Kussmaul 1200 Charger - 10 Amps* *Kussmaul 35/10 Charger - 10 Amps* *1000W Engine Heater - 8.33 Amps* *1500W Engine Heater - 12.5 Amps* *120V Air Compressor - 4.2 Amps* **ELECTRICAL INLET LOCATION** An electrical inlet shall be installed on the left hand side of cab over the wheel well. **ELECTRICAL INLET CONNECTION** The electrical inlet shall be connected to the battery conditioner. **ELECTRICAL INLET COLOR** The electrical inlet connection shall include a yellow cover. **HEADLIGHTS** The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels. **FRONT TURN SIGNALS** The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome bezel outboard of the front warning and above the headlamps.			

HEADLIGHT LOCATION The headlights shall be located on the front fascia of the cab directly below the front warning lights. **SIDE TURN/MARKER LIGHTS** The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners. **MARKER AND ICC LIGHTS** In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. **HEADLIGHT AND MARKER LIGHT ACTIVATION** The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released. **GROUND LIGHTS** Each door shall include Amdor H2O LED model AY-9500-012 ground lighting mounted to the underside of the cab step below each door. The lights shall be 12.00 inches in length. The ground lighting shall be activated by the opening of the door on the respective cab side, when the parking brake is set as well as when the truck is placed in reverse and through a virtual button on the Vista display and control screen			

LOWER CAB STEP LIGHTS The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door. **INTERMEDIATE STEP LIGHTS** The intermediate step well area at each door shall include an LED light within a chrome housing. The Egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with Entry step lighting. **ENGINE COMPARTMENT LIGHT** There shall be an LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted. **LIGHTBAR PROVISION** There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by Spartan Chassis. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash. **CAB FRONT LIGHTBAR** The lightbar provisions shall be for one (1) Whelen brand Freedom IV LED lightbar mounted centered on the front of the cab roof. The lightbar shall be 72.00 inches in length. The lightbar shall feature twelve (12) red LED light modules and four (4) clear LED light modules. The entire lightbar shall feature a clear lens. The clear lights shall be disabled with park brake engaged. The cable shall exit the lightbar on the right side of the cab.			

LIGHTBAR SWITCH The light bar shall be controlled by a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification. **FRONT SCENE LIGHTS** The front of the cab shall include one (1) Whelen model Pioneer PFP2 contour roof mount scene light installed on the brow of the cab. The lamp head shall have two (2) 12 volt high intensity LED panels. Each lamp head shall draw 12.0 amps and generate 14,000 lumens total. The lamp head will be adjustable up to 20-degrees and shall measure 4.25 inches in height X 14.00 inches in width. The lamp head and brackets shall be powder coated white. **FRONT SCENE LIGHTS ACTIVATION** The front scene lighting shall be activated by a virtual button on the Vista display and control screen. **FRONT SCENE LIGHT LOCATION** There shall be one (1) scene light mounted center on the front brow of the cab. **SIDE SCENE LIGHTS** The cab shall include two (2) Whelen M9 LED scene lights, one (1) each side which shall be surface mounted. The Whelen lights shall provide directional lighting from twenty four (24) Super-LEDs and a clear gradient lens. The scene light shall have specialized TIR optics for ideal scene illumination. **SIDE SCENE LIGHT LOCATION** The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab “B” pillar in the 10.00 inch			

raised roof portion of the cab between the front and rear crew doors. **SIDE SCENE ACTIVATION** The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light. **INTERIOR OVERHEAD LIGHTS** The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door, and both the red and clear portion can be activated by individual push lenses on each lamp. An additional separately functioning red and clear Whelen LED dome lamp shall be provided over the engine tunnel. Each individual function can be activated dependently by switches on the lamp. **SPOTLIGHT** The officer position shall include one (1) 12 volt Optronics KB-4003 hand-held spotlight which shall be mounted to the right of the engine tunnel top surface. The spotlight shall provide 400,000 candlepower of illumination and shall include a 10.00 foot coil cord and a momentary push button switch. **DO NOT MOVE APPARATUS LIGHT** The front headliner of the cab shall include a flashing red Whelen Ion LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated. The flashing red light shall be located centered left to right for greatest visibility.			

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released. **MASTER WARNING SWITCH** A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled “E Master” for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the “ON” position when the master switch is activated shall automatically power up. **HEADLIGHT FLASHER** An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right. Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied. **HEADLIGHT FLASHER SWITCH** The flashing headlights shall be activated through a virtual button on the Vista display and control screen. **INBOARD FRONT WARNING LIGHTS** The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel			

INBOARD FRONT WARNING LIGHTS COLOR The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens. **FRONT WARNING SWITCH** The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification. **INTERSECTION WARNING LIGHTS** The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. **INTERSECTION WARNING LIGHTS COLOR** The intersection lights shall be red with a clear lens. **INTERSECTION WARNING LIGHTS LOCATION** The intersection lights shall be mounted on the side of the bumper in the rearward position. **SIDE WARNING LIGHTS** The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. **SIDE WARNING LIGHTS COLOR** The warning lights located on the side of the cab shall be red with clear lens. **SIDE WARNING LIGHTS LOCATION** The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.			

SIDE AND INTERSECTION WARNING SWITCH The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification. **SIREN CONTROL HEAD** A Whelen 295HFSA7 electronic siren control head with remote dual amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected. **HORN BUTTON SELECTOR SWITCH** A virtual button on the Vista display and control screen shall be provided to allow control of the electric horn, the air horn, or the electronic siren from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in any position to meet FMCSA requirements. **AIR HORN ACTIVATION** The air horn activation shall be accomplished by the steering wheel horn button for the driver and a black momentary push button on the switch panel. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector. **ELECTRONIC SIREN AUXILIARY ACTIVATION** The electronic siren shall include activation by the steering wheel horn button. **BACK-UP ALARM** An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall			

automatically activate when the transmission is placed in reverse. **INSTRUMENTATION** An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring. A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions. The instrument panel shall contain the following gauges: One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 160 KM/H, and the secondary scale on the speedometer shall read from 0 to 100 MPH. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level. One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 1030 kilopascals (kPA) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure. One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall			

read from 0 to 830 kilopascals (kPA) with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 40 to 120 degrees Celsius (C) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 40 to 150 degrees Celsius (C) with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature. The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations: **RED INDICATORS** Stop Engine - indicates critical engine fault Air Filter Restricted - indicates excessive engine air intake restriction Park Brake - indicates parking brake is set Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened Low Coolant - indicates critically low engine coolant Cab Tilt Lock - indicates the cab tilt system locks are not engaged.			

AMBER INDICATORS Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault Check Engine - indicates engine fault Check Transmission - indicates transmission fault Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault High exhaust system temperature – indicates elevated exhaust temperatures Water in Fuel - indicates presence of water in fuel filter Wait to Start - indicates active engine air preheat cycle Windshield Washer Fluid – indicates washer fluid is low DPF restriction - indicates a restriction of the diesel particulate filter Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur. SRS - indicates a problem in the supplemental restraint system Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention. **GREEN INDICATORS** Left and Right turn signal indicators ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system High Idle - indicates engine high idle is active.			

Cruise Control - indicates cruise control is enabled OK to Pump - indicates the pump is engaged and conditions have been met for pump operations Pump Engaged - indicates the pump transmission is currently in pump gear Auxiliary Brake - indicates secondary braking device is active **BLUE INDICATORS** High Beam indicator **AUDIBLE ALARMS** Air Filter Restriction Cab Tilt Lock Check Engine Check Transmission Open Door/Compartment High Coolant Temperature High or Low System Voltage High Transmission Temperature Low Air Pressure Low Coolant Level Low DEF Level Low Engine Oil Pressure Low Fuel Seatbelt Indicator Stop Engine			

Water in Fuel Extended Left/Right Turn Signal On ABS System Fault **BACKLIGHTING COLOR** The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting. **RADIO** A Panasonic radio with weather band, AM/FM stereo receiver, compact disc player, and four (4) speakers shall be installed in the cab. The radio shall be installed above the driver position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab. **AM/FM ANTENNA** A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception. **CAMERA** An Audiovox Voyager heavy duty rearview camera system shall be supplied. One (1) camera with a teardrop shaped chrome plated housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle. The camera shall be wired to a single Weldon Vista display. The camera shall activate when the transmission is placed in reverse and by a button on the Vista display. **COMMUNICATION ANTENNA** An antenna base, for use with an NMO type antenna, shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be an			

Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be provided by Spartan. **COMMUNICATION ANTENNA CABLE ROUTING** The antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console. **AUXILIARY COMMUNICATION ANTENNA** An auxiliary antenna base, for use with and NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be provided by Spartan. **AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING** The auxiliary antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console. **CAB EXTERIOR PROTECTION** The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer. **FIRE EXTINGUISHER** A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.			

DOOR KEYS The cab and chassis shall include a total of four (4) door keys for the manual door locks. **DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION** Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner. The software has been validated to be compatible with the following RP1210 interface adapters: • Dearborn Group DPA4 Plus • Noregon Systems JPRO® DLA+ • Cummins INLINE5 • Cummins INLINE6 • NexIQ™ USB-Link™ The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column. **WARRANTY** Summary of Warranty Terms: THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT. The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall			

commence on the date the vehicle is delivered to the first end user. **CHASSIS OPERATION MANUAL** There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model. **ENGINE AND TRANSMISSION OPERATION MANUALS** The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items: (2) Hard copies of the Engine Operation and Maintenance manual with CD (2) Digital copies of the Transmission Operator's manual (2) Digital copies of the Engine Owner's manual **ENGINE SERVICE MANUALS** There shall be two (2) printed hard copy sets of Cummins ISC/ISL engine service reference manuals which shall be provided with the chassis. **TRANSMISSION SERVICE MANUALS** There shall be two (2) printed hard copy sets of Allison 3000 transmission service manuals included with the chassis. **CAB/CHASSIS AS BUILT WIRING DIAGRAMS** The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams. **PAINT CONFIRMATION** There shall be a paint confirmation letter sent to the body manufacturer with paint spray outs to confirm the cab primary			

paint color or primary and secondary paint color as specified by the paint options. **SALES TERMS** The sale of the Spartan Chassis shall be governed by the terms contained on the Sales Terms – Acceptance of Purchase Order document, a copy of which is attached to this option. **DRIVELINE LAYOUT CONFIRMATION** During the design phase of the chassis the Spartan Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released. **3D CHASSIS LAYOUT** A three dimensional (3D) layout of the chassis shall be provided to the OEM engineering group for use in designing the OEM body. The layout shall include the following: Cab Frame Bumper Front Towing Device Front Axle Front Suspension Cab Tilt Exhaust Air Drier Battery Boxes & Covers			

Rear Axle Rear Suspension Fuel Tank **BUMPER EXTENSION CHECKPLATE APRON** An aluminum checker plate apron shall be installed between the front of the cab and the extended front bumper. This apron shall be trimmed as required to fit the contour of both the cab and the bumper. One (1) aluminum hose bin(s) shall be installed in the front checker plate apron. The hose bin(s) shall have a capacity to hold at least 150 of 1.5" discharge hose. Turtle tile matting shall be supplied and installed in the bin(s). One (1) checker plate cover(s) shall be provided for the hose bin(s). The checker plate cover(s) shall be hinged with a stainless steel piano type hinge, come with spring gas strut and a stainless steel D ring handle. **WHEEL ALIGNMENT** After the body has been installed the chassis shall have the wheels re-aligned. **CHASSIS PREPARATION** The chassis shall be carefully inspected for compliance to the required specifications and to assure that it is ready for apparatus construction. Any components that require relocation or modification shall be done at this time. **FUEL FILL DOOR** A Signature Series brushed stainless steel fuel fill assembly shall be provided on the rear fender of the apparatus body. This fuel fill assembly shall include a spring loaded stainless steel hinged door and a label stating "DIESEL FUEL ONLY".			

EXHAUST SYSTEM The chassis exhaust system shall be modified and routed to the right hand side of the apparatus ahead of the rear wheels. The end of the exhaust shall have a straight cut end which is suitable for a fire hall exhaust extraction system. **CHASSIS WHEELS** The chassis wheels shall be an aluminum polished finish from the chassis supplier. Chassis Supplied Hub And LugNut Covers - Install At FGFT **FRONT AND REAR MUD FLAPS** Four (4) heavy duty rubber rear mud flaps shall be provided and installed on the apparatus. The mud flaps shall be installed behind the front and rear wheels. **SCBA AIR BOTTLE BRACKET(S) - CHASSIS CAB** Four (4) Bostrom SecureAll SCBA air bottle holder bracket(s) shall be provided and installed in the chassis cab seating area. **AIR INLET CONNECTION** There shall be an air inlet shoreline installed at the left cab door area and connected into the chassis air brake system. The air fitting for this inlet shall be male. **TRANSPORTATION ROAD SAFETY KIT** The following Transportation Road Safety Kit shall be supplied. One (1) 2.5 lb. ABC vehicle type fire extinguisher with mounting bracket. One (1) standard First Aid Kit shall be provided. One (1) set of three (3) dual faced triangular warning flares to meet the Department of Transportation's Motor Vehicle Safety Standards.			

CHASSIS CAB DOOR LETTERING Single color lettering with a background outline shading shall be provided on the cab doors as directed by the Fire Department. Reflective Striping - 4" - Custom Cab Accent Stripe -2" Reflective - Custom Cab There shall be a one inch wide reflective stripe applied to the front of the apparatus. The reflective stripe shall be a 3M Scotchlite product. **PUMP HOUSE** The pump house shall be a full frame module constructed from 2" x 2" x .188" and 3" x 3" x .25" (6061-T6 / 6063-T6) heavy-duty structural aluminum extrusions which shall provide maximum strength and durability. The pump house shall be manufactured separately to allow for movement and flexibility. The pump house shall be attached to the chassis frame with .25" thick heavy-duty mounting plates and .5" grade 8 cadmium plated bolts with self-locking nuts. A transition bracket with rubber mounts shall be installed to the chassis frame. The pump house shall then be mounted to the rubber mounts. The front and rear of the pump house shall have 1/8" 3003 H14 Hi Shine checker plate trim. **PUMP INSPECTION DOOR** The pump house interior shall be accessible by an inspection door on the right side. The inspection door shall be constructed from .125" aluminum high shine checker plate. The door shall be fastened to the upper portion of the pump house with stainless steel piano hinges. The locking mechanisms for the door shall be a set of two (2) lift and turn twist lock latches.			

PUMP HOUSE FINISH The pump house shall come with a natural aluminum finish that has been sanded. **HEAT PANS** The bottom of the pump house shall be fitted with a heat pan. The heat pan shall enclose all sides, front, and rear and bottom of the pump house. The heat pan vertical side walls shall be constructed from 1/8" 5083-H321 salt water grade sheet aluminum and shall be installed to the underside of the pump house. There shall be dual 12 gauge 5052 H321 aluminum panels that shall be split in the center and removable for access to the pump house components. Any additional vertical enclosure to properly enclose the heat pan around chassis components shall be with 12 gauge 5052 H321 aluminum. **CONTROL PANEL - SIDE** The pump operator's panel and the right side pump panel shall be constructed from 1/8" aluminum with a black vinyl anti-glare coating. Both the right side and left side pump panels shall be bolted to the pump house for ease of removal. The pump operator's panel shall be manufactured in a two-tier design. The bottom/lower tier (portion) shall be screwed into place and can be removable for servicing. The lower level contains all the valve controls, discharges, suctions, drains, etc. All suction and discharge ports exiting through the panels shall be laser cut to provide a smooth exact fit. No cover overlay plates shall be used. The top tier (portion) of the panel shall be bottom hinged with a stainless steel piano hinge and shall have two (2) lift and turn			

twist lock latches located at the top of the panel for pump and gauge servicing. This panel shall contain all gauges and monitoring instruments. All gauges and controls shall be symmetrically and logically laid out to easily enable the pump operator to monitor all aspects of pump operation. All valve controls shall be made by use of heavy-duty steel rods, pivots, and Class I operators. Auxiliary suction valve controls shall be lever controlled adjacent to the suction swivel. The auxiliary suction valve shall be installed behind the pump panel.**(Mandatory Requirement)** **PUMP INSPECTION DOOR** The pump house interior shall be accessible by an inspection door on the right side. The inspection door shall be constructed from .125" aluminum high shine checker plate. The door shall be fastened to the upper portion of the pump house with stainless steel piano hinges. The locking mechanisms for the door shall be a set of two (2) lift and turn twist lock latches. **MASTER GAUGE TEST PORTS** The pump operator panel shall come with Class 1 P/N 121384 vacuum and pressure testing ports. **PUMP BYPASS CONTROL** A Class 1 P/N 105120 brass assembly with chrome plated zinc handle petcock control valve shall be mounted at the pump operator panel to allow tank water to re circulate thru the pump. The port size and plumbing shall be 1/4" **AUXILIARY HEAT EXCHANGER** There shall be an auxiliary heat exchanger mounted on the chassis. The heat exchanger will allow tank water to cool the chassis engine.			

The heat exchanger shall be operated by a Class 1 P/N 105120 brass assemble with chrome plated zinc handle petcock control valve. This valve shall be mounted at the pump operator panel. The plumbing to the auxiliary heat exchanger control valve shall be 1/4". **CROSS LAY HOSEBED** Two (2) cross lay hose beds shall be provided and installed transversely above the pump house and shall have vinyl hose matting flooring to allow for water drainage and air movement under the hose. A 3/16" aluminum divider shall separate the hose beds. Each hose bed shall be sized to hold 200' of 1 3/4" hose. **CROSS LAY PLUMBING - 1.5" DISCHARGE** The plumbing on the 1.5" discharge(s) shall be heavy duty piping with Victaulic and Class 1 SBR synthetic rubber hose with stainless steel couplings. Each discharge shall be equipped with a 90 degree swivel to allow them to be used from either side of the apparatus. **Discharge Gauge - Dual Scale** A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions).			

The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **THREAD TYPE - DISCHARGE 1.5"** All 1.5" thread types shall be NPSH. **Akron Style 8820 Swing - Out™ Valve** The valve shall be Akron Brass Style 8820 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **CROSS LAY TARP** A heavy duty vinyl tarp cover shall be provided over the cross lay compartments and held in position with Velcro fasteners. The vinyl tarp shall be black in color.			

PUMP HOUSE RUBBER SEAL There shall be a rubber foam cell permanently mounted between the pump house and the body for maximum pump house heat retention. The seal shall be mounted vertically down the height of the pump house, one each side. **RUB RAILS - PUMP HOUSE RUNNING BOARDS - NON SLIP** Three inch "C" channel aluminum rub rails shall be bolted into place with nylon spacers on the lower framework on the pump house running boards. The rub rail will extend to the outside edges of the running boards for protection from impact damage The top surface of the rub rail shall have a non-slip surface meeting the requirements of NFPA 1901 for non slip walking surfaces. **CANOPY / PUMP HOUSE ENCLOSURE HEATERS** Two (2) 17,500 BTU forced air coolant heaters shall be installed. The heaters shall be mounted low in the pump house so that the heat will be distributed evenly in the pump house and will keep the drain lines open. A two speed switch shall be mounted on the pump panel for operation of the heaters. **PUMP PANEL LIGHTS - LED - SIDE PANEL** There shall be a total of four (4) 6.5" x 3" Tecniq E10 clear LED dome lights, (two (2) each side) to adequately illuminate the side pump panels. The lights shall be mounted under a protective hood of the same material as the side pump panels. The lights shall be activated by a switch at the pump operator panel. **PRESSURE GOVERNOR, MONITORING, and MASTER PRESSURE DISPLAY** Fire Research InControl series TGA400-A00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof			

and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 data bus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. The following continuous displays shall be provided: Pump discharge; shown with four daylight bright LED digits more than 1/2" high Pump Intake; shown with four daylight bright LED digits more than 1/2" high Pressure / RPM setting; shown on a dot matrix message display Pressure and RPM operating mode LEDs Throttle ready LED Engine RPM; shown with four daylight bright LED digits more than 1/2" high Check engine and stop engine warning LEDs Oil pressure; shown on a dual color (green/red) LED bar graph display Engine coolant temperature; shown on a dual color (green/red) LED bar graph display Transmission Temperature: shown on a dual color (green/red) LED bar graph display Battery voltage; shown on a dual color (green/red) LED bar graph display. The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when			

selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation. The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions: High Battery Voltage Low Battery Voltage (Engine Off) Low Battery Voltage (Engine Running) High Transmission Temperature Low Engine Oil Pressure High Engine Coolant Temperature Out of Water (visual alarm only) No Engine Response (visual alarm only). The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements. Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi. **WATER TANK VOLUME INDICATOR** Fire Research TankVision Pro model WLA300-A00 tank indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case			

shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label. The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm. The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors. **PUMP – HALE DSD** The pump shall be a Hale Pump, Model DSD 1250. The pump shall be rated at: 5000 Liters per minute at 150 P.S.I. 1050 Imperial Gallons per minute at 150 P.S.I. 1250 U.S. Gallons per minute at 150 P.S.I. The pump shall be the class "A" type and shall deliver the percentage of rated discharge at pressures indicated below. 100% of rated capacities at 150 PSI net pump pressure. 100% of rated capacities at 165 PSI net pump pressure. 70% of rated capacities at 200 PSI net pump pressure. 50% of rated capacities at 250 PSI net pump pressure.			

The pump when dry shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose of the appropriate size. An additional 15 seconds shall be allowed when the system includes an auxiliary 4" or larger front or rear intake pipe. **Pump Assembly** 1. The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 1050 imperial gallons per minute (1250 U.S. GPM), NFPA-1901 rated performance. 2. The entire pump shall be assembled and tested at the pump manufacturer's factory. 3. The pump shall be driven by a drive line from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance. 4. The entire pump shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration. 5. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable. 6. Pump body shall be vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings. 7. Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.			

8. The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machines, hand-ground and individually balanced. The vanes of the impeller intake eye shall be hand ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. 9. Pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined hand ground and individually balanced. The vanes of the impeller intake eyes shall be hand ground and polished to a sharp edge and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. 10. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body. 11. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox. **Gearbox** 1. Pump gearbox shall be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.. 2. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine. 3. All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. (No exceptions.)			

4. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected. 5. If the gearbox is equipped with a power shift, the shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump. 6. For automatic transmissions, three green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on pump operators panel adjacent to the throttle control. For manual transmissions, one green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates. **MASTER DRAIN VALVE** A Hale #DV-5 master drain valve shall be provided and plumbed at the lowest point of the plumbing. **PUMP OPERATION WARNING LABEL** There shall be a warning label mounted on the pump operator's panel that states the following: **Warning: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.** **Hale ESP Oilless Primer** The priming pump shall be a positive displacement, vane type and electrically driven. This primer shall be a Hale #ESP electric oil-less priming system. One (1) priming control shall both open the priming valve and start the priming motor.			

The primer valve shall be connected to the top of both pump volutes making it possible to prime the pump no matter if the pump is in pressure or volume modes. If a front suction is supplied and additional line shall be connected to the highest point or points between the pump and the inlet thus insuring a complete prime. **PRIMING SYSTEM LABEL** The priming system shall be marked with a label to indicate proper operation. **6" MAIN SUCTION MANIFOLD - STAINLESS STEEL** There shall be a total of two (2) 6" main inlets on each side of the pump house. **Both intakes shall be complete with an electric master intake valve controlled from the pump panel.** The plumbing for the two (2) main suction inlets shall be single piece design manufactured from schedule 10 stainless steel with schedule 40 threaded fittings. The suction manifold shall be bolted to the pump utilizing heavy duty grade 8 bolts for firm vibration free installation. A victaulic coupler is not acceptable. (**Mandatory Requirement)** **AUXILIARY SUCTION - ROAD SIDE** One (2) 2-1/2" gated inlet(s) shall be provided at the left side pump panel. The inlet(s) shall come complete with a chrome female swivel threaded adaptor. There shall be a chrome cap with the inlet(s) and the cap shall come with a chain that is attached to the pump operator panel. The plumbing shall be schedule 10 stainless steel. A rubber grommet shall enclose the plumbing coming out of the pump panel for maximum heat retention in the pump house. (**Mandatory Requirement)**			

Akron Style 8825 Swing - Out™ Valve The valves shall be Akron Brass Style 8825 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valve control shall be by a chrome swing handle located near the discharge. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **SUCTION RELIEF VALVE** A 2-1/2" Elkhart model 40-20 flange mounted adjustable suction relief valve shall be provided and installed in the suction side of the pump. The discharge side of the valve shall be plumbed to the area below the running board, away from the pump operator, and shall terminate with a 2-1/2" NST male threaded adapter, marked **"INTAKE PRESSURE RELIEF OUTLET-DO NOT CAP"**. The relief valve shall have an adjustable working range of 75 PSIG to 250 PSIG and be pre-set at 125 PSI. **TANK FILL LINE - PUMP TO TANK** There shall be a 2" discharge provided at the pump operator panel for a pump to tank line.			

Akron Style 8820 Swing - Out™ Valve The valve shall be Akron Brass Style 8820 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **DISCHARGE MANIFOLD - STAINLESS STEEL** All plumbing for the discharge manifold and discharge plumbing shall be schedule 10 stainless steel with schedule 40 threaded fittings. In some cases, heavy duty, high pressure, wire reinforced flexible hose with stainless steel couplings shall be utilized for plumbing connections. Victaulic couplings shall be used on the plumbing lines to take tension off piping and to permit flexing and movement without damage to the pump and its components. Heavy duty U-bolt clamps and bracing shall be used on all plumbing lines and connections were required for firm vibration free installation. **TANK SUPPLY LINE** A 4" tank supply line shall be installed from the tank to the pump. A 3" check valve shall be installed in the pump to			

eliminate the possibility of pressure expanding and damaging the tank. **Butterfly Valve** The valve shall be a 3" manually operated butterfly valve. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **2.5" DISCHARGE - CURB SIDE** One (1) 2.5" gated discharge(s) shall be provided at the right side pump panel. This discharge(s) shall be equipped with a chrome 30 degree adapter, chrome plated rocker lug cap, and retaining chain that is attached to the pump panel. A rubber grommet shall enclose the plumbing coming out of the pump panel for maximum heat retention in the pump house. (**Mandatory Requirement)** **Discharge Gauge - Dual Scale** A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions).			

The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **Akron Style 8825 Swing - Out™ Valve** The valves shall be Akron Brass Style 8825 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valve control shall be by a chrome swing handle located near the discharge. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **2.5" DISCHARGE - CURBSIDE** Two (2) 2.5" gated discharge(s) shall be provided at the curbside pump panel. This discharge(s) shall be equipped with a chrome 30 degree adapter, chrome plated rocker lug cap, and retaining chain that is attached to the pump panel. A rubber grommet shall enclose the plumbing coming out of the pump panel for maximum heat retention in the pump house. (**Mandatory Requirement)**			

Discharge Gauge - Dual Scale A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions). The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **Akron Style 8825 Swing - Out™ Valve** The valves shall be Akron Brass Style 8825 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements.			

Drain Valves A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **3" DELUGE GUN DISCHARGE WITH SLO-CLOZ** A 3" deluge gun discharge shall be provided and installed above the pump house. The plumbing leading to the monitor standpipe shall be schedule 40 stainless steel plumbing. A threaded cap shall come with the monitor standpipe if no monitor is ordered. **Discharge Gauge - Dual Scale** A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions). The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **Akron Style 8830 Swing - Out™ Valve** The valves shall be Akron Brass Style 8830 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion.			

The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. The valve shall come with an Akron Slo Cloz assembly. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **THREAD TYPE - DISCHARGE 2.5"** The threads that shall be provided for the 2.5" Discharges and 2.5" Suction Inlets shall be WCT. **MONITOR-AKRON APOLLO HI RISER 24"** An Akron Apollo Hi-Riser monitor shall be provided and installed on the deck gun piping with an Akron direct mount flange. The monitor shall have the ability to raise 24 inches in height from the base direct flange. The monitor shall have 360 degree horizontal continuous rotation and a vertical travel from 90 degrees above to 45 degrees below horizon with a built in 35 degrees stop. The monitor shall be capable of flowing 1250 us GPM (4800 LPM) in the deck position. There shall be an Akron Pyrolite 2 ½"x21/2" discharge pip #3488 and a set of Akron 2 ½" Pyrolite stacked tips #2499 supplied and installed on the monitor.			

1.5" FRONT BUMPER DISCHARGE There shall be One (1) 1.5" discharge(s) provided to the front bumper area. The plumbing shall be 2" schedule 10 stainless steel with schedule 40 stainless steel fittings and Class 1 high pressure hose with stainless steel couplings. **Discharge Gauge - Dual Scale** A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions). The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **Akron Style 8820 Swing - Out™ Valve** The valve shall be Akron Brass Style 8820 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer’s warranty.			

Valve Actuator The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **STORZ DISCHARGE WITH SLO CLOZ- SIDE** One (1) gated Storz discharge(s) shall be provided at the curbside pump panel. The plumbing shall be 3" diameter stainless steel plumbing. **Discharge Gauge - Dual Scale** A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions). The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. The inlet(s) shall be equipped with a 4" Storz 30 degree adapter, Storz cap, and retaining chain that is attached to the apparatus body.			

Akron Style 8830 Swing - Out™ Valve The valves shall be Akron Brass Style 8830 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. The valve shall come with an Akron Slo Cloz assembly. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements. **Drain Valves** A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **2.5" DISCHARGE - REAR** One (1) 2.5" gated discharge(s) shall be provided at the rear of the apparatus. The plumbing leading to the rear discharge shall be high pressure Class 1 hose and schedule 10 stainless steel with schedule 40 threaded fittings. This discharge(s) shall be equipped with a chrome 30 degree adapter, chrome plated rocker lug cap, and retaining chain that is attached to the apparatus body.			

Discharge Gauge - Dual Scale A 2.5" discharge gauges shall be mounted adjacent to the discharge valve control handle. A removable bright metal or color coded trim ring meeting NFPA's requirements for color coding shall be supplied. The gauge shall be fully filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem (no exceptions). The gauges shall be in dual scale and measure in increments of 0-400 psi and 0-2800 kPa. **Akron Style 8825 Swing - Out™ Valve** The valves shall be Akron Brass Style 8825 Swing-Out™ Valves. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. Product must carry a 10 year manufacturer's warranty. **Valve Actuator** The valves shall have chrome T handle actuators. For chemical and wear resistance a Lamacoid label specifying the discharge shall be inset into the T handle actuator. The label shall be color coded as per NFPA 1901 requirements.			

Drain Valves A drain shall be installed at the pump panel. The drain shall have 3/4" Synflex drain lines tied to a 1/4 turn drain valve with high pressure brass fittings. **FOAM PRO 2001 FOAM SYSTEM** The vehicle shall be equipped with an electronic, fully automatic, variable speed direct injection, discharge side foam proportioning system. The system shall be capable of handling foam concentrate. The foam system shall be a FoamPro 2001. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows, and pressures. The system must be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a control module suitable for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flow meter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump. A paddlewheel type flow meter shall be installed in the discharges specified to be foam capable. As this system uses more than one flow meter an interface electronics module will be provided to totalize these flows and send the flow total to the microprocessor in the computer control display. The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:			

1) Provide push-button control of foam proportioning rates from .1% to 9.9% in .1% increments. 2) Show the current flow per minute of water. 3) Show the total volume of water discharged during and after foam operations are completed. 4) Show the total amount of foam concentrate consumed. 5) Slow the flow rates for manual operation. 6) Perform setup and diagnostic functions for the computer controlled microprocessor. 7) Flash a "low concentrate" warning when the foam concentrate tank(s) run low. 8) Flash a "no concentrate" warning and shut the foam concentrate pump off, preventing damage to the pump should the foam tank(s) empty. A 12 volt electric motor driven positive displacement foam concentrate pump shall be provided. The pump capacity shall be 2.5 gpm at 400 psi. A pump motor electronic driver shall receive signals from the computer control display and power the 1/2 hp electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream. A full flow check valve shall be provided to prevent foam contamination of the fir pump and water tank or water contamination of the foam tank(s). The 2000 series components shall include: 1) An operator control and display 2) Paddlewheel flow meters 3) Foam pump and electric motor/motor driver			

4) All required wiring harness 5) Low level tank switch(s) 6) Multi-Flo electronic module 7) An electronic dual tank valve or manual dual tank valve 8) A foam injection check valve An operations manual shall be provided for the unit. **FOAM SYSTEM DISCHARGE MANIFOLD** A brass foam discharge manifold shall be provided for the foam system. This foam manifold shall have four (4) outlets for connection into the apparatus plumbing system. **INTEGRAL FOAM TANK** The integral foam tank shall have the following capacities: ***25 Imperial gallons*** ***114 liters*** The foam tank shall be provided as an integral part of the booster tank and piped to the foam system. The tank shall have a separate fill tower with cover labeled ("FOAM FILL ONLY") for filling the foam tank. Note: The main booster tank will be reduced in size in order to accommodate the integral foam tank. **CLASS A FOAM TANK VOLUME INDICATOR** Fire Research TankVision Pro model WLA360-A00 tank indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, a 10' sensor cable and a tank vent. The indicator shall show the volume of Class A foam concentrate in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180			

degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive green label. The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm. The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the foam tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors. **INTEGRAL FOAM TANK WATER ALLOWANCE** The integral foam cell will deduct water from the specified water tank volume. **BOOSTER TANK** The booster tank shall have the following capacities: ***800 Imperial gallons*** ***3637 liters*** This tank shall be provided with a lifetime warranty tank manufacturer. The transverse and longitudinal swash partitions shall be manufactured of Polypropylene Copolymer material. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow and meet NFPA rules. All swash partitions interlock with one another			

and are welded to each other as well as to the walls and floor of the tank. The tank shall have a combination vent and fill tower. The fill tower shall be constructed of .5" thick Polypropylene Copolymer and shall be a minimum dimension of 8"x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified by the purchaser. The tower shall have a .25" thick removable Polypropylene Copolymer screen and a Polypropylene Copolymer hinged-type cover. Inside the fill tower, there shall be a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 pipe with a minimum I.D of 4", unless a dump chute is included in the design in which case the I.D shall be 6". Both shall be of a design to run through the tank. The tank overflow shall be piped behind the rear wheels. The tank cover shall be constructed of recessed .5" thick Polypropylene Copolymer, stress relieved, U.V. stabilized material. A minimum of two lifting dowels shall be drilled and tapped .5" x 2" to accommodate the lifting eyes. There shall be one (1) sump standard per tank. The sump shall be constructed of .5" Polypropylene Copolymer and be located in the left front corner of the tank and shall meet the requirements of NFPA. There will be two (2) standard tank outlets: one for tank to sump suction line and one for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1,000 G.P.M. The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing			

must be decreased to allow for not more than 400 square inches of unsupported area. The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of .25” x 2” and a minimum Rockwell hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and capture both front and rear as well as side to side to prevent tank from shifting during vehicle operation. The tank shall be mounted in the apparatus body in a manner that the total outside bottom perimeter of the tank shall be supported. The bottom of the tank shall be completely isolated from the frame by heavy-duty .25" thick rubber strips. There shall be a picture frame type cradle mount system utilized for the purpose of capturing the tank. There shall be a support system across the top of the tank to prevent excessive bouncing when the tank is empty. Although the tank is designed as a free-floating suspension unit, it is required that the tank has adequate hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on the top of the tank, halfway between the front and rear on each side of the tank. The tank shall be completely removable without disturbing or dismantling the apparatus structure. **TANK DRAIN** The tank shall have a 1.5" tank drain installed in the bottom of the tank and accessible from the ground. **ROLL OUT TRAY(S)** Three (3) heavy duty ball bearing roll out tray shall be provided. The tray(s) shall have two (2) side mounted, 500 lb. rated ball bearing roll out 18" travel sliding tracks and a 3/16" aluminum			

tray with up turned edges. The tray shall be supplied with plastic floor matting and corner drain holes. The tray(s) shall have a drop bar tray retainer to keep the tray secure in either the open or closed position. All trays shall come with rubber matting. **SCBA AIR BOTTLE STORAGE COMPARTMENT(S)** There shall be two (3) double air bottle storage compartment(s) installed in the rear fenders. Two (2) curbside and 0ne (1) roadside. The double air bottle storage compartment(s) shall have a sealed weatherproof stainless steel access door with two black compression latch opening devices. The door shall be secured with a stainless steel hinge. The bottle storage tubes shall be manufactured from aluminum and come with rubber matting to protect the bottles. A nylon strap shall secure the air bottle in the tube in case of accidental door opening while in transit. The door shall be tied to the door ajar warning light in the chassis cab. **APPARATUS BODY** The body shall be fabricated with the highest quality components available, and acceptable to the fire service industry. Only new components shall be in the manufacturing process. The body shall be engineered and designed to provide a low center of gravity and carry a correct load distribution. The entire body superstructure and sub frame shall be constructed of heavy-duty tubular aluminum and channels to provide a full frame body design.			

The use of tubular aluminum and channels shall provide for extreme strength, maximum durability, and maximum resistance to buckling and failure. The full frame body construction method shall provide for greater strength and integrity. Formed body construction shall not be acceptable. All compartments shall be fabricated with 1/8" aluminum panels, salt-water marine grade 5083-H321, which are inserted into the body framework. The framework allows for reinforcement to the compartment, for installation of heavy equipment. The 1/8" aluminum panels, salt-water marine grade 5083-H321 panels shall provide extreme strength, rust corrosion resistance, and maximum durability. Skilled craftsmen shall perform all welding operations on the body. All welding shall be electronically with the highest quality components. Certified welders shall perform all welding. Proof of welder certification shall be provided with the completed vehicle. **BODY SUBFRAME** The body framework shall be assembled on a jig, and shall be clamped together and squared. The framework shall be electronically welded with digital pulse welders forming the integral superstructure. The body frame rails shall be constructed of 6061T6/6063-T6, 3" x 3" aluminum extrusions, with a wall thickness of 1/4". The front cross member shall be a heavy duty 3" x 2" x 1/4" aluminum extrusions providing maximum strength and durability. The two middle cross members shall be heavy duty 3" x 3" x 1/4" aluminum extrusions providing maximum strength and durability at the main section of the body.			

The rear cross members shall be heavy duty 3" x 2" x 1/4" aluminum extrusions providing maximum strength and durability at the rear section of the body. The two middle cross members shall extend the full width of the body. The cross members shall provide support for the body side compartments section. The body sub frame and the chassis frame shall be insulated and separated by a rubberized belt. There shall be rear drop sub frame bolted to chassis frame made from formed heavy steel rails. The body shall be mounted to the chassis frame rails with two double flex mounts at the front, two steel channels in the middle, bolted to the chassis frame at the rear end of chassis frame and four single flex mounts at the drop frame. This shall provide for maximum mounting strength and flexibility. **CORROSION PROTECTION** All body components or attachments made from dissimilar metals shall be fastened to the body utilizing an UHMW/Polyethylene material to prevent metal-to-metal contact preventing dielectric corrosion. All fasteners used in attaching or fastening or aluminum panels shall be installed with stainless steel hardware. Rivets shall not be acceptable. (**Mandatory Requirement)** All fasteners shall be installed in a manner, which shall involve drilling, tapping, and application of non-corrosive grease before the stainless steel bolts are installed. Self-tapping screws or screws without threads shall not be acceptable. (**Mandatory Requirement)**			

HOSE BED The main hose bed shall be located above the booster tank and be sized to meet the requirements for a Pumper Fire Apparatus as specified in NFPA 1901 (Latest Edition) and ULC S515-13 The inner sides of the hose bed shall be natural finish aluminum smooth plate free of protrusions and obstructions. There shall be three (3) Aluminum unistrut tracks for the optional hose bed divider(s), two (2) at the forward section of the hose bed, and one (1) at the rear. The rear track shall have come with 10' of snap cover to prevent the hose couplings from catching the track. The snap cover shall be shipped loose for customer installation after the hose bed dividers have been set up. **HOSE BED MATTING** The hose bed flooring shall be fitted with vinyl type matting to allow for air movement under the hose. **HOSE BED DIVIDER - ADJUSTABLE** There shall be three (3) adjustable hose bed divider provided. The divider shall be easily adjustable in the hose bed slide tracks. Each divider shall be constructed from 3/16" 5083-H321 salt water marine grade aluminum which shall be welded into a custom aluminum extrusion base frame. Each hose bed divider shall have an oval handhold provided at the rear portion of the divider. **HOSE BED TARP** One (1) vinyl hose bed tarp shall be provided with shock cord fasteners or depending on hose bed obstructions, a combination of shock cord fasteners and nickel plated quarter turn fasteners for the main hose bed. The hose bed tarp shall have an end flap			

with Velcro fasteners provided to cover the rear of the hose bed. The tarp shall be black in color. **COMPARTMENT MATTING** There shall be versatile PVC matting supplied on the all body compartment floors. The matting shall be interlocking and 1" high to allow for air movement. **REAR FENDERS** The rear fenders of the apparatus shall be fully removable to allow for servicing of the apparatus suspension system. The rear fender outer skin shall be fabricated from 1/8" 3003-H14 hi shine aluminum checker plate. The inner wheel well shall be fabricated from 1/8" 5083-H321 salt water grade aluminum. The fender shall be attached to the body using stainless steel screws. The screws shall be pre tapped before installation. Self tapping screws are not acceptable. All dissimilar metals shall receive a strip of UHMW isolation tape for corrosion resistance. **REAR BODY SECTION - NATURAL FINISH ALUMINUM** The rear section of the apparatus body shall be finished with 1/8" 5083 H321 aluminum plate panels. The panels shall have a natural finish for installation of Chevron. The panels shall be fastened to the rear body framework with stainless steel fasteners. The stainless steel fasteners are drill tapped. Sheet metal screws or self-tapping screws are not acceptable. (**Mandatory Requirement)** **ACCESS LADDER - ZICO - REAR** There shall be a 12" wide Zico Quic-Ladder provided on the rear of the apparatus for access to the main hose bed. The ladder assembly shall consist of a twostep fold-down with a 3 step straight section and the ladder will store parallel to the body. There is a release mechanism with a locking handle so you cab			

pull the ladder out to a comfortable climbing angle. The ladder automatically latches and will not retract until the scissor lock is raised. Cast aluminum rungs have a flat, non-skid surface to provide traction and safety. The handrails are 1¼" heavy-walled aluminum tubing, covered in a rough grip black powder coat. **HOSE BED ACCESS LADDER STEP LIGHT** The hose bed access ladder steps area shall be illuminated by one (1) Whelen PELCC LED light. **TAILBOARD** A heavy-duty 8" deep tailboard shall be provided The tailboard shall be covered with slip resistant 3/16" embossed checker plate. The aluminum checker plate shall be bolted to the tailboard sub frame with non-corrosive stainless steel bolts. The bolt on aluminum tread plate shall allow for easy removal for service. The forward section of the tailboard shall be gapped to allow washing without dirt being trapped and for the drainage of accumulated water. **BODY HAND RAILS** The following handrails shall be installed on the apparatus body. One (1) 48" handrails mounted vertically on the curbside rear. One (1) 42" mounted horizontally on the upper rear, below the hose bed area. The body hand rail shall be 1 1/4" in diameter and shall be knurled aluminum for maximum grip and safety The hand rail shall be installed and supported with chrome plated polished cast brackets. The hand rail brackets shall be provided with an isolation gasket and held in place with stainless steel screws.			

FOLDING STEPS - CURB SIDE REAR One (1) folding aluminum steps shall be installed on the curb side rear of the apparatus. The steps shall be mounted to a 3/8" plate with stainless steel screws. The plate shall be permanently welded to the apparatus body frame. **FOLDING STEPS - CURB SIDE FRONT** One (1) folding aluminum steps shall be installed on the curb side front of the apparatus. The steps shall be mounted to a 3/8" plate with stainless steel screws. The plate shall be permanently welded to the apparatus body frame. **FOLDING STEPS - ROAD SIDE FRONT** One (1) folding aluminum steps shall be installed on the road side front of the apparatus. The steps shall be mounted to a 3/8" plate with stainless steel screws. The plate shall be permanently welded to the apparatus body frame. **STEP LIGHTS - LED** All steps on the body shall have adequate light for illumination. The lights shall be Tecniq EON-Linear White 2.9"W lights for folding and cast step lighting or shall be already supplied with the manufacturer supplied steps. **LICENSE PLATE ILLUMINATION** A LED light shall illuminate the rear license plate mount. the light shall come with a chrome bezel. **CHEVRON STRIPPING** There shall be 6" chevron stripping decals applied to the rear face of the apparatus. The chevron decals shall be made of high visibility Reflexite™ material that is red / yellow in color and			

shaped to form an "A" style pattern. A minimum of 50% of the rear body shall be covered with Chevron. **COMPARTMENT MATTING** There shall be versatile PVC matting supplied on the all body compartment floors. The matting shall be interlocking and 1" high to allow for air movement. **LEFT SIDE BODY COMPARTMENTS - HIGH** The following compartments shall be provided on the driver's side of the apparatus body and shall be used as a minimum, keeping in mind the total compartment cubic inch storage capacity. One (1) compartment forward of the rear wheel measuring 48.25"W x 69"H x 27"D frame opening. One (1) compartment over the rear wheel measuring 62.25"W x 40"H x 27"D frame opening. One (1) compartment behind the rear wheel measuring 48.25"W x 69"H x 27"D frame opening. The body compartments shall be fabricated with 1/8" 5083 - H321 salt water marine grade aluminum panels. These panels shall be non-corrosive, durable, and add strength and integrity to the body construction. The interior compartment seams shall be sealed and caulked with a permanent, pliable automotive type sealer. All compartments shall have a 1" drop on the lower edge of the door opening to accommodate the door seal, and to stop moisture from entering the compartment. (**Mandatory Requirement)** All compartments shall have sweep out floors. All compartments shall be weatherproof.			

ZICO OVERHEAD LADDER RACK A Zico, 12 volt electrically operated side rack shall be installed on the right side of the apparatus body above the lower body compartments and extend vertically when raised over the side of the apparatus body and hose bed area. The control switch shall be installed at the right side rear of the apparatus. **RIGHT SIDE BODY COMPARTMENTS** The following compartments shall be provided on the curbside of the apparatus body and shall be used as a minimum, keeping in mind the total compartment cubic inch storage capacity. One (1) compartment forward of the rear wheel measuring 48.25"W x 69"H x 15"/ 27"D frame opening. One (1) compartment over the rear wheel measuring 62.25"W x 40"H x 15"D frame opening. **Minus the width of the Zico Ladder mechanism.** One (1) compartment behind the rear wheel measuring 48.25"W x 69"H x 27"D frame opening. The body compartments shall be fabricated with 1/8" 5083 salt water marine grade aluminum panels. These panels shall be non-corrosive, durable, and add strength and integrity to the body construction. The interior compartment seams shall be sealed and caulked with a permanent, pliable automotive type sealer. All compartments shall have a 1" drop on the lower edge of the door opening to accommodate the door seal, and to stop moisture from entering the compartment. (**Mandatory Requirement)** All compartments shall have sweep out floors. All compartments shall be weatherproof.			

REAR BODY COMPARTMENT The following compartments shall be provided on the rear of the apparatus body and shall be used as a minimum, keeping in mind the total compartment cubic inch storage capacity. One (1) compartment measuring 44"W x 54"H x 30"D frame opening. **AMDOR ROLL UP DOORS** The doors shall be Amdor Roll-Up type doors to include: double wall aluminum box section slats with integral hinge joint and recessed slat seal, reusable end shoes with snap-in securement, double wall aluminum reinforced bottom rail with either Stainless Steel Lift Bar door latching system, aluminum track with side frame, sill plate, and top gutter with non-marring top seal, side seals, bottom seal, with all wear component material to be Type 6 Nylon. The slats shall have a true box section with a flat interior surface to prevent equipment hang-up. The slats shall have a face depth of 1.0 inches and a wall thickness of 0.045 inches. Each slat incorporates a recessed slat seal to weatherproof the compartment and reduce rattle between slats. For every inch of height an integral continuous hinge joint spans the width of the door to provide superior strength. The door glides on non-interlocked end shoes. Each end shoe is independent and positively secured by an exclusive snap-in device. Door slats can be easily removed and replaced when required. The Stainless Steel Lift Bar system shall be provided to keep the door securely closed. This system complements the superior strength of the bottom rail with bottom seal and integral reinforcing flange. Wear components are constructed of Type 6 Nylon to provide maximum strength and durability. Type 6 Nylon is a naturally lubricating material, which provides exceptional temperature			

characteristics. Each door is equipped with slat, top, bottom and side seals to keep moisture and dirt on the outside. The non-marring top seal provides a seal without marking the door surface. The compartment door at the L1 location shall be Amdor roll up style. The compartment door at the L2 location shall be Amdor roll up style. The compartment door at the L3 location shall be Amdor roll up style. The compartment door at the R1 location shall be Amdor roll up style. The compartment door at the R2 location shall be Amdor roll up style. The compartment door at the R3 location shall be Amdor roll up style. The compartment door at the B1 location shall be Amdor roll up style. **COMPARTMENT SHELVING - ADJUSTABLE** Four (4) adjustable 3/16" aluminum compartment shelves with upturned edges shall be provided. Each shelf shall be provided with plastic matting. **ADJUSTABLE SHELVING UNI-STRUT SIDE TRACKS** Four (4) set(s) of four (4) aluminum unistrut side tracks shall be provided for installation of adjustable shelves. **RUB RAILS - APPARATUS BODY** Three inch "C" channel aluminum rub rails shall be bolted into place with nylon spacers on the lower framework below the apparatus body compartments. The rub rail will extend to the			

outside edges of the apparatus body for protection of the body from impact damage. **REAR TOW HOOKS - PAINTED** Two (2) heavy duty steel painted tow hooks shall be bolted directly to the rear frame rails. The tow hooks shall be easily accessible from the rear of the apparatus body thru a removable panel. The panel shall have lift and turn paddle latches. The door shall be manufactured from 3/16" 5052 - H32 aluminum. **COMPARTMENT LIGHTS - LED** All body compartments shall have Amdor Lumabar LED lights activated by an automatic door switch. The LED compartment lights shall be flush mount and provide a consistent 120 degree wide beam pattern. There shall be a minimum of two strip lights installed in each compartment. **TRAFFIC CONTROL DIRECTIONAL LIGHT - LED** One (1) Whelen model TAL85 LED directional light shall be mounted on the rear of the vehicle as high as possible for best visibility. Traffic Advisor -Installation - Multiplex Chassis **TRAFFIC CONTROL DIRECTIONAL LIGHT HOOD** The traffic control directional light shall be surface mounted. The traffic control device shall be protected by the horizontal hose bed access handrail. **REARVIEW CAMERA MOUNTING - CHASSIS SUPPLIED CAMERA** The camera mounted on the rear of the apparatus shall be supplied by the chassis supplier but will be installed by the apparatus builder. The camera shall come with a protective hood if there is a danger of any items from the hose bed area , stepping surfaces, etc causing damage to the camera.			

ELECTRICAL SYSTEM - MULTIPLEXED The manufacturer shall design the wiring system for the apparatus in accordance to the SAE, Society of Automobile Engineers. The manufacturer shall determine the circuit loads and design the system to accommodate these loads with appropriate circuit routings and relays. All wiring harnesses shall be properly secured and routed. All passages required for routing shall be grommeted and sealed as required. All wiring shall be easily accessible for servicing. All wiring shall be SAE J1128 and SAE J1292 GXL type wire, as per fire industry standards. All exposed wiring shall be crimped and heat shrunk for added protection. The wiring harnesses shall be pre-engineered for correct circuit loading and shall be custom made. The harnesses shall be function, number, and color coded and shall be fitted inside automotive high temperature loom. All connections to the main panel box must be made with waterproof automotive style guided pin locking connectors An enclosed main electrical distribution panel that provides protection against dirt, dust, oil, and water shall be installed in the upper section of the pump house. All electrical connections to the panel shall be made through positive locking environmentally sealed connectors. The panel features a solid state power distribution board(s) with visual diagnostics. All circuits are protected by automatic resetting circuit breakers. All breakers shall be properly sized to the circuit load and are direct plug in sockets.			

All wiring shall have a strain pull test on wiring connections of 40 pounds. **BATTERY MASTER SWITCH** The battery master switch shall be supplied by the chassis manufacturer. **ZONE A UPPER EMERGENCY LIGHTING** The zone A upper emergency lighting zone shall have the following: **LIGHTBAR** The light bar shall be provided and installed by the chassis manufacturer. **ZONE A LOWER EMERGENCY LIGHTING** The zone A lower emergency lighting zone shall have the following lights and shall be mounted to the chassis grill: The emergency lights in this zone are chassis supplied. See chassis specifications. **ZONE B UPPER EMERGENCY LIGHTING** The zone B upper emergency lighting zone shall have the following: There shall be Two (2) Whelen M9 Series intersection lights installed. These lights shall have a split red / clear lens and come with red / white LED's, and come with a chrome bezel. **ZONE B LOWER EMERGENCY LIGHTING** The zone B lower emergency lighting zone shall have the following: There shall be One (1) Whelen M6 Series intersection lights mounted.			

These lights shall have a clear lens, red LED's and come with a chrome bezel. **ZONE C UPPER EMERGENCY LIGHTING** The zone C upper emergency lighting zone shall have the following: There shall be Two (2) Whelen M9 Series intersection lights installed. These lights shall have a clear lens, RED LED's, and come with a chrome bezel. **ZONE C LOWER EMERGENCY LIGHTING** The zone C lower emergency lighting zone shall have the following: There shall be Two (2) Whelen M6 Series intersection lights mounted. These lights shall have a clear lens, red LED's and come with a chrome bezel. **ZONE D UPPER EMERGENCY LIGHTING** The zone D upper emergency lighting zone shall have the following: There shall be Two (2) Whelen M9 Series intersection lights installed. These lights shall have a split red / clear lens and come with red / white LED's, and come with a chrome bezel. **ZONE D LOWER ZONE** The zone D lower emergency lighting zone shall have the following: There shall be One (1) Whelen M6 Series intersection lights mounted. These lights shall have a clear lens, red LED's and come with a chrome bezel.			

ZONE D LOWER ZONE The zone D lower emergency lighting zone shall have the following: **HEADLIGHT WIG WAG FLASHER** The chassis high beam headlights shall be equipped with an alternating flashing, wig wag headlight system. An electronic flasher shall be used to control the lights. A control switch panel shall activate the flashing system. **REAR TAIL LIGHT ASSEMBLY** The rear tail light assembly shall consist of the following: There shall be a total of Two (2) Whelen Plast3VL chrome plated plastic brake / tail / turn light bezels installed on the rear of the apparatus. One each side. The bezels shall be attached with pre-tapped stainless steel fasteners. **Brake Light Assembly - M6 LED** There shall be Two (2) Whelen M6BTT Series LED turn lights installed on the rear of the apparatus. These lights shall be installed in the tail light bezels on the rear of the apparatus and shall come with red lenses **Turn Light Assembly - LED** There shall be Two (2) Whelen M6T Series amber LED turn lights installed on the rear of the apparatus. These lights shall be installed in the tail light bezels on the rear of the apparatus. **Turn Light Assembly - LED - Maximum Intensity** There shall be Two (2) Whelen M6 Model M6BUW White LED backup lights installed on the rear of the apparatus. **HOSEBED FLOOD LIGHT(S) - LED** There shall be one (1) Whelen Micro Pioneer™ Model # MPPWCS provided. The 45 watt +12 DC Micro Pioneer light head configuration shall incorporate 12 white Super-LED® with a TIR			

reflector installed in a white die-cast powder coated aluminum housing and a polycarbonate cover with a chrome finish. The MPPWCS shall have an On/Off switch covered by a rubber boot and a black fiberglass enforced polycarbonate handle. The low profile pedestal mount shall consist of a cast stainless steel pedestal base with cast stainless steel swivel mount stud, pivot, and hinge assembly. The MPPWCS light shall have 4,100 usable lumens. A cast aluminum alloy lens retainer with a liquid injected silicone gasket shall protect against environmental conditions. The hard coated lenses shall provide extended life/luster protection against UV and chemical stresses. The MPPWCS shall be shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. The MPPWCS shall have extended LED operation with low current consumption and low operating temperature. Two breathable membrane patches shall be installed to the bottom of the housing to maintain a consistent internal pressure. The MPPWCS is covered by a five year factory warranty. **GROUND LIGHTS - LED** There shall be eight (8) Luma Bar H2O 12” LED ground lights with outward facing angle brackets installed underneath the apparatus. The ground lights shall be activated by a switch installed in the chassis cab. Ground lights that are directly underneath a door opening will turn on automatically when the door is opened. **ENGINE COMPARTMENT LIGHT - LED** One (1) Tecniq E10 LED light(s) shall be installed in the engine compartment. The lights shall be activated when the hood is opened.			

LIGHT TOWER A Knight KL, manufactured by Command Light, part number KL415D-FX-LED, light tower shall be provided for installation on the apparatus. The location of the light tower shall be located at the top of the canopy enclosure or next to monitor position. The controls shall be installed according to instructions given by the customer and the requirements of the light tower manufacturer. The light tower shall extend 87-1/2" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 30" wide x 47" long x 13" high and weigh approximately 165 pounds. **Light Tower Construction and Design** The light tower assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance. The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower. The light tower shall be tested to in wind conditions of 90 mph (150 k/ph) minimum. Other type floodlights that have not been tested to these conditions are not acceptable. The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Any tower that is only capable of rotations at the top of a pole is not an acceptable alternative to the specified tower.			

Light Tower Electrical System The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the lower stage and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction. The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA1901. **Light Tower Floodlights** The Command Light shall be equipped with the following bank of floodlights: Floodlight manufacturer: Fire Research Number of lamp heads: Four (4) Spectra Max SPA-100-Q28 (DC- LED) Voltage: 12 volt Watts of each lamp head: 230 watt Total watts of light tower: 920 watts Amperage per lamp head: 19.2 amps Total amperage of light tower: 76.8 amps Total Lumens of light tower: 112,000 lumens Configuration: The light heads shall be mounted two (2) on each side of the light tower, giving two (2) vertical lines of two (2) when the lights are in the upright position.			

The Command Light Tower shall come with the back light option. The back light option shall allow the lower level lights to be able to rotate 180° to the rear of the upper lights. Compliance to the light tower specifications **DOOR AJAR SYSTEM** A chassis supplied red flashing warning light for the door ajar system shall be provided in the cab. This light shall be activated when a compartment door on the apparatus body is open. A magnetic sensor shall be installed in all compartments with a roll up door A On / Off depression style switch shall be supplied in all compartments with a pan door. **CLEARANCE AND MARKER LIGHTS - LED** All clearance / marker lights, reflectors shall comply with department of transport motor vehicle safety standards. The clearance / marker lights shall be LED (light emitting diode) type. A set of LED (light emitting diode) mid body turn signals shall be installed to comply with department of transport motor vehicle safety standards for vehicles over 30 feet in length. **TWO WAY RADIO POWER SUPPLY** There shall be a dedicated 12V power supply line coiled underneath the chassis dash for the future install of a customer supplied two way radio. **PAINT COLOR - CHASSIS** The chassis shall be painted a two tone color by the chassis manufacturer. The lower paint color shall be the color of the final apparatus body.			

FINISH AND PAINTING - PPG The painting shall be done in accordance with automotive practices using Delfleet® Evolution FBCH high solids polyurethane paint with the PPG painting process. All painting shall be baked at 160 degrees F. for a minimum 45 minutes to provide an automotive quality finish. After assembly, the body substructure shall be deburred and hand sanded. All ledges inside and outside shall be cleaned and sealed. The painting process consists of the following applications: a) Wash entire body with DX 440 wax and grease remover b) Etch primer, PPG F3963 (0.2 - 0.35 mils dry) c) Primer, PPG F3975 (3.0 - 6.0 mils dry) d) Wash entire body with DX 330 wax and grease remover e) Primer sealer, Epoxy PPG F399x (1.0 - 4.0 mils dry) f) Base coat, Delfleet® evolution PPG FBCH (1.0 - 3.0 mils dry) g) Clear coat, PPG F3906 clear (minimum of 2.0 mils) All outside seams that are not 100 percent welded shall be sealed and caulked inside and outside. Only after the entire painting process is completed shall the body structures be installed on the chassis. Only after the body is painted shall the components such as doors, aluminum inlay panels, mounting brackets, handrails, pump panels, and other accessories be installed.			

PAINT POLISH BODY - A.C.T. STANDARDS #6 The paint finish on the body shall meet the ACT test panel #6 level for orange peel visual standard. Test sample swatches shall be made available on request for paint finish comparison. **(Mandatory Requirement)** **COMPARTMENT FINISH** The interior of all compartments of the body shall also be sealed and caulked. A textured finish of light gray urethane paint with a white and black spatter finish shall be applied to all compartment interiors. **BODY UNDERCOATING - CORASHIELD®** The whole frame / cross members / wheelwell area / and inner body of the apparatus body shall be thoroughly prepared and sprayed with Corashield® that will help prevent rust and corrosion. A minimum of 8-10 mils of Corashield® shall be sprayed. The bottom, sides and tops of the cross members shall be fully covered. The Corashield® is a sprayable latex coating designed for use on aluminum, fiber glass, cold rolled steel, galvanized steel, and most metal primers. Corashield® is formulated to give very good corrosion protection. This medium viscosity, sag resistant coating can be easily sprayed onto exposed underbody areas, and into restricted areas such as tubing and "hidden" areas accessible only with spray wands. Corashield® dries quickly at ambient temperatures and will withstand urethane paint bakes after only 30 min drying at room temperature. Corashield® provides better protection than any of the competitive products tested without the environmental and safety problems inherent in many of the undercoating available today.			

4" REFLECTIVE BODY PRIMARY STRIPING There shall be a four inch wide reflective stripe applied to the left and right sides of the apparatus according to the requirements of NFPA 1901 latest edition. The reflective stripe shall be a 3M Scotchlite product. **KEEP BACK WARNING SIGN** One (1) "KEEP BACK 150 METERS" sign with 3" Scotch-Lite letters shall be provided and mounted on the rear where specified. **FOLDING LADDER** A Duo-Safety model 585-A, 10 foot folding ladder shall be provided and installed at the Zico overhead ladder rack. **ROOF LADDER** A Duo-Safety model 775-A, 14 foot roof ladder shall be provided. **EXTENSION LADDER** A Duo-Safety model 900-A, 24 foot, 2-section extension ladder shall be provided. **ATTIC LADDER BRACKET** An attic ladder bracket shall be installed at the Zico overhead ladder rack. **HARD SUCTION HOSE MOUNTING** Suction hose storage for two (2) lengths of hard suction hose shall be installed within the Zico overhead ladder rack. **HARD SUCTION HOSE - KOCHEK** Two (2) ten foot section(s) of 6" Kochek PVC lightweight, flexible, hard suction hose shall be provided with lightweight male and long handle female threaded couplings.			

BARREL STRAINER One (1) 6" Kochek barrel strainer shall be provided and shipped loose with the completed vehicle. **FLAT HEAD AXE(S)** Two (2) 6 pound fiber glass handled flat head axe(s) shall be provided. **CHROME AXE POCKET(S) - HORIZONTAL** Two (2) horizontal chrome axe holder(s) complete with a chrome hook for the axe handle shall be provided. The axe pocket(s) shall be installed in a location as directed by the fire department. **FIRE EXTINGUISHER(S) - ABC DRY CHEMICAL** One (1) 20lb ABC dry chemical fire extinguisher(s) shall be provided. **EXTINGUISHER BRACKET(S)** One (1) extinguisher mounting bracket(s) shall be provided and mounted on the apparatus. **CROW BAR & BRACKET** One (1) 54" steel crow bar complete with chrome mounting brackets shall be provided and installed. **WHEEL CHOCKS & BRACKETS** Two (2) Hasbra wheel chocks shall be provided complete with mounting brackets. The brackets shall be installed forward of the rear wheels and underneath the main body. **HELMET HOLDERS** There shall be six (6) Zico helmet holders supplied with the apparatus. The helmet holder shall comply with the 2009 edition of NFPA 1901 for use inside of crew cabs. It holds both			

traditional and contemporary style helmets without any adjustment needed. **SHORELINE AND RECEPTACLES** Located at L-1, L-3 and R-3 compartments shall be a 110 volt duplex receptacle plugs. The power source shall be 110 volt. The wiring shall terminate to the same Kussmaul Auto eject receptacle at the left side cab step connected to the Kussmaul battery charger and air compressor.			

NOTE: Where and when the aforementioned descriptions appear to favour a particular brand and model of vehicle, descriptions are meant to be general in nature and all manufacturers may submit equivalent equipment based on the requirements of this proposal.

Clarification

The Town reserves the right to contact any Proponent to seek clarification of the contents of the Proposal submission. The Town may investigate, as it deems necessary, the ability of the Proponent to perform the Work and the Proponent shall furnish the Town all such information and data for this purpose as the Town may request.

References

Some scores assigned to various categories may be determined through reference checks.

Interviews

The Evaluation Team may elect to interview some or all of the Proponents and their key staff at its sole discretion.

Proposal Evaluation Process

The evaluation stage will consist of a scoring by the Evaluation Team of each qualified Proposal on the basis of the Rated Criteria of the written Proposals. The highest scored Proposal, representing best overall value to the Town, will be recommended for selection by the Evaluation Team.

In the event that the Town is unable to successfully execute an Agreement with the first ranked Proponent in a timely manner, the Town may invite the next ranked Proponent to finalize an Agreement with the Town.

Recommendation / Award

Recommendation for award of this Proposal will be based on the Proponent's overall total score, where it is in the best interest of the Town.

By responding to this RFP, the Proponent agrees to accept the recommendation of the Evaluation Team as final and binding.

Award of the Proposal may require the approval of Town Council.

TERMS AND CONDITIONS OF THE RFP PROCESS

Proponents to Follow Instructions

Proponents should structure their Proposals in accordance with the instructions in this RFP. Where information is requested in this RFP, any response made in a Proposal should reference the applicable section numbers of the RFP where that request is made.

COMMUNICATION AFTER ISSUANCE OF RFP

Proponents to Review RFP

Proponents shall promptly examine all of the documents comprising this RFP and

1. Shall report any errors, omissions or ambiguities; and
2. May direct questions or seek additional information by fax or email, on or before the Proponent's Deadline for Questions to the Town Contact. No such communications are to be directed to anyone other than the Town Contact. The Town is under no obligation to provide additional information but may do so at its sole discretion.

The Town Contact for this RFP is:
Jim Sawkins
Fire Chief
Town of Erin
(519) 855-4407 ext. 243
jim.sawkins@erin.ca

The Town and its advisors do not make any representations, warranty or guarantee as to the accuracy of the information contained in the RFP or issued by way of addenda.

It is the Proponent's responsibility to avail itself of all the necessary information to prepare a Proposal in response to this RFP.

All New Information to Proponents by way of Addenda

This RFP may be amended by an addendum in accordance with this section.

If the Town, for any reason, determines that it is necessary to provide additional information relating to this RFP, such information will be communicated to all Proponents by addenda. Each addendum shall form an integral part of this RFP.

Such addenda may contain important information including significant changes to this RFP. It is the sole responsibility of the Proponent to register their intention to submit a proposal with the Town in order to be placed on the distribution list for any addenda. Proponents are responsible for obtaining all addenda issued by the Town. In the space provided in the Form of Offer, Proponents shall confirm their receipt of all addenda by setting out the number of each addenda in the space provided for in the Form of Offer.

Post-Deadline Addenda and Extension of Proposal Submission Deadline

If any addenda are issued after the Deadline for Issuing Addenda, the Town may at its discretion extend the Proposal Submission Deadline for a reasonable amount of time.

SUBMISSION OF PROPOSALS

Proposals Submitted Only in Prescribed Manner

Proposals must be submitted by the following method:

A Proponent must submit:

a) An original copy of its Proposal in a sealed envelope or package (the "Proposal Envelope") containing the Proposal or one (1) softcopy through e-mail. This e-mail, envelope or package must be labelled with the Proponent's name and marked as indicated above.

The outside of the sealed Proposal package must be prominently marked with the RFP title, with the full legal name and return address of the Proponent, with the Proposal Submission Deadline date and time.

Proposals must be submitted to the Procurement Division.

Proponents assume sole responsibility for late deliveries. Proposals submitted in any other manner will be disqualified.

Proposals Must Be Submitted On Time at Prescribed Location

Proposals must be submitted at the location set out above on or before the Proposal Submission Deadline. Proposals submitted after the Proposal Submission Deadline will be disqualified.

Amending or Withdrawing Proposals Prior to Submission Deadline

At any time prior to the Proposal Submission Deadline, a Proponent may amend or withdraw a submitted Proposal. The right of a Proponent to amend or withdraw a Proposal includes amendments or withdrawals wholly initiated by the Proponent and amendments or withdrawals in response to subsequent information provided by the Town.

Any amendment should clearly indicate what part of the Proposal the amendment is intending to replace.

Any amendment or notice of withdrawal must be submitted in the same manner as prescribed in this RFP for the submission of Proposals. Any amendment or notice of withdrawal submitted by any other method will not be accepted.

Proposal Irrevocable after Proposal Submission Deadline

Proposals shall remain irrevocable in the form submitted by the Proponent for a period of sixty (60) days from the Proposal Submission Deadline.

Town May Seek Clarification and Incorporate Response Into Proposal

The Town reserves the right to seek clarification and supplementary information from Proponents after the Proposal Submission Deadline. Any response received by the Town from a Proponent shall, if accepted by the Town, form an integral part of that Proponent's Proposal.

RFP Incorporated into Proposal

All of the provisions of this RFP are deemed to be accepted by each Proponent and incorporated into each Proponent's Proposal.

Proposal Property of the Town

Except where expressly set out to the contrary in this RFP, the Proposal and any accompanying documentation submitted by a Proponent shall become the property of the Town and shall not be returned.

EXECUTION OF AGREEMENT

Selection of Proponent

The Town anticipates that a Proponent will be selected within 60 days of the Proposal Submission Deadline. Notice of selection by the Town to the selected Proponent will be in writing. The selected Proponent shall execute the Agreement and satisfy any other applicable conditions of this RFP within 15 days of notice of selection.

Failure to Enter Agreement

In addition to the Town's other remedies, if a selected Proponent fails to execute the Agreement or satisfy any other applicable condition within 30 days of notice of selection, the Town may, in its sole discretion and without incurring any liability, rescind the selection of that Proponent.

Notification to Other Proponents of Award and Debriefing

Once an Agreement is executed between the successful Proponent and the Town, the other Proponents will be notified by the Town in writing of the award of the Agreement to the successful Proponent.

PROHIBITED COMMUNICATION AND CONFIDENTIAL INFORMATION

Prohibited Proponent Communications

Any attempt on the part of any Proponent or any of its employees, agents, contractors or representatives to contact any person other than the Town Contact with respect to this RFP, will be grounds for disqualification. For clarification and without limiting the generality of the foregoing, no attempt will be made to contact any member of the Town Evaluation Team, Senior Leadership Team, elected officials or any expert or other adviser assisting the Town Evaluation Team.

In such event, and without any liability, the Town may, in its sole discretion and absolute discretion, in addition to any other remedies available by law, disqualify the Proposal submitted by the Proponent.

Proponent Not to Communicate with Media

A Proponent may not at any time directly or indirectly communicate with the media in relation to this RFP or any contract awarded pursuant to this RFP without first obtaining the written permission of the Town.

Confidential Information of the Town

All information provided by or obtained from the Town in any form in connection with this RFP either before or after the issuance of this RFP:

a) Is the sole property of the Town and must be treated as confidential;
b) Is not to be used for any purpose other than replying to this RFP and the performance of any subsequent Agreement;
c) Must not be disclosed without prior written authorization from the Town; and
d) Shall be returned by the Proponents to the Town immediately upon the request of the Town.

Subject to Municipal Freedom of Information and Protection of Privacy Act

Information provided by a Proponent may be released in accordance with the Municipal Freedom of Information and Privacy Act R.S.O. 1990, c.M 56, as amended. A Proponent shall identify any information in its Proposal or any accompanying documentation for which confidentiality is to be maintained by the Town.

The confidentiality of such information will be maintained by the Town, except where an order by the Information and Privacy Commission or a court requires the Town to do otherwise.

Rights of the Town

In addition to any other expressed rights or any other rights which may be implied in the circumstances, the Town reserves the rights to:

a) Make public the names of any or all Proponents;
b) Request written clarification or the submission of supplementary written information from any Proponent;
c) Waive formalities and accept Proposals which substantially comply with the requirements of the RFP;
d) Verify with any Proponent or with a third party any information set out in a Proposal;
e) Check references other than those provided by any Proponent;
f) Disqualify any Proponent whose Proposal contains misrepresentations or any other inaccurate or misleading information;
g) Disqualify any Proponent or the Proposal of any Proponent who has engaged in conduct prohibited by this RFP;
h) Make changes, including substantial changes, to this RFP provided that those changes are issued by way of addenda in the manner set out in this RFP; i) Accept or reject a Proposal if only one Proposal is submitted;
j) Select any Proponent other than the Proponent whose Proposal reflects the lowest cost to the Town;
k) Cancel this RFP process at any stage;
l) Cancel this RFP process at any stage and issue a new RFP for the same or similar services;

m) Accept any Proposal in whole or in part, provided that doing so complies with the Town Procurement Policy and other applicable laws;
n) Discuss with any Proponent different or additional terms to those contemplated in this RFP or in any Proponent's Proposal;
o) Reject any or all Proposals in its absolute discretion;

and the Town shall not be liable for any expenses, costs, losses or any direct or indirect damages incurred or suffered by any Proponent or any third party resulting from the Town exercising any of its express rights under this RFP or exercising any rights which may be implied in the circumstances.

By submitting a Proposal, the Proponent authorizes the collection by the Town of the information set out under (d) and (e) in the manner contemplated in those subparagraphs.

Governing Law of RFP Process

This RFP process shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

Signing Page (Appendix A)

All responses should be signed:

2018 4 Door Custom Cab 1050 IGPM Pumper/Rescue

I/We certify that the information provided in this RFP Response Document is true and complete.

I/We declare that no employee of the Erin is or will become interested, directly or indirectly as a contracting party or otherwise in the supplies, work or business to which it relates or in any portion of the profits thereof, or in any such supplies to be therein or in any of the monies derived there from.

I/We further declare that the undersigned is empowered by the Proponent to negotiate all matters with the partnering municipality's representatives, relative to this Proposal.

I/We further declare that the agent listed below is hereby authorized by the Proponent to submit this Proposal and is authorized to negotiate on behalf of the Proponent.

Legal Company Name:	
Respondent's Signature:	
Respondent's Printed Name:	
Respondent's Title:	
Email:	
Business Phone:	
Business Fax:	