Lake Crystal Fire Department
Lake Crystal, MN
Walk-In Equipment Van Specifications
Dated: 01-14-2020

Intent of Specifications
It shall be the intent of these specifications to cover the furnishing and delivery of a complete aluminum walk-in equipment van apparatus to the Lake Crystal, MN Fire Department. The apparatus shall be equipped as specified as follows in these specifications. These specifications only cover the general construction requirements, equipment, appliances and certain details to finish as to which the successful bidder must conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the successful bidder, who shall be solely responsible for the design and construction of all features. The apparatus proposed by the bidders shall meet Federal Motor Vehicle requirements at the time of construction.

Warranties
The apparatus shall be warranted and free from defects in materials and workmanship under normal use and service for a period of one (1) year on the complete apparatus in addition to any warranties from the individual components manufacturer.

Chassis: The apparatus chassis will be provided with a warranty through the chassis builder.

General Information
It is the intent of these specifications to secure apparatus constructed to withstand the severe and continuous use encountered during emergency firefighting services. The apparatus will be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained. These specifications detail the requirements for general design criteria of cab and chassis components, fire body, electrical components, painting, and equipment. In evaluating the bid proposals to determine which proposal is the most advantageous, these major items will be considered.

Apparatus and equipment must meet the specific requirements and intent of the requirements as specified herein. All items of these specifications will conform to the character of the proposed apparatus and the purpose for which it is intended. Criteria as specified by the National Fire Protection Association Pamphlet No. 1901, latest edition, entitled "Suggested Specifications for Motor Fire Apparatus", as approved by the American Insurance Association and International Association of Fire Chiefs, is hereby adopted and made a part of these specifications the same as if they were written out in full, insofar as they apply and are not specifically modified in the following detailed specifications. Bidder will provide only that equipment as required in the following specifications. The fire apparatus and equipment to be furnished in meeting these specifications must be the products of an established, reputable fire apparatus and/or equipment manufacturer. Each bidder will furnish satisfactory evidence of the manufacturer's ability to construct, supply service parts and technical assistance for the apparatus specified. He must state the location of the factory and location for post delivery service.
Each bidder will supply proof of product liability insurance equal to or exceeding $2,000,000.00. This will be provided as part of the proposal.

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

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

1. Owners name and address
2. Apparatus manufacturer, model, and serial number
3. Chassis make, model, and serial number
4. GAWR of front and rear axles
5. Front tire size and total rated capacity in pounds
6. Rear tire size and total rated capacity in pounds
7. Chassis weight distribution in pounds with water and manufacturer mounted equipment front and rear
8. Engine make, model, serial number, number of cylinders, bore, stroke, displacement and compression ratio, rated horsepower and related speed per SAE J690 certification of Maximum Net Horsepower for Motor Trucks and Truck Tractors, and no-load governed speed.
9. Type of fuel and fuel tank capacity
10. Electrical system voltage and alternator output in amps.
11. Battery make and model, capacity in CCA
12. Transmission make, model and type
13. Paint numbers
14. Company name and signature or responsible company representative

A) Weight documents from certified scale - showing actual loading on the front axle, rear axle(s) and overall vehicle weight will be supplied with the complete vehicle to determine compliance with Section 8-1.

B) Written load analysis and results of electrical performance test required in Chapter 9.

The chassis will be certified by the apparatus manufacturer as conforming to all applicable federal motor vehicle safety standards in effect at the date of contract. This will be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who will be recognized as the responsible final manufacturer. The successful bidder will be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus. These records will be maintained in the factory of the bidder for a minimum of twenty (20) years. File will contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents, the purchaser will have access to any and all documents contained in this file upon request.

**Prices and Payments**

Total price on bidder's proposal sheet must include all items listed in these specifications. Bidder will compute pricing less federal and state taxes. It is understood that any applicable taxes will be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms. The proposed body bid price, plus or minus any change orders authorized by the Lake Crystal, MN Fire Department Chief, shall be paid in full upon delivery and acceptance by the fire Department.
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The chassis must be paid for in full to the chassis manufacturer/dealer at the time of chassis completion.

All bids shall be valid for a minimum of 90 days.

Delivery Time
Each bidder will state the completed apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by the apparatus manufacturer. The build on this apparatus shall be 150-180 days after receipt of the chassis at the manufacturing facility. The bidder will not be held liable for delay in delivery caused by delayed shipment of the chassis by the chassis manufacturer, accidents, strikes, floods or other events not subject to their control.

Material and Workmanship
All equipment furnished will be guaranteed to be new and of current manufacture, to meet all requirements of these specifications, and to be in intended use condition at time of delivery. All workmanship will be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

Sales Engineer
The successful bidder will designate a competent individual, acceptable to the purchaser, to perform the contractor's sales engineer functions. The sales engineer will provide a single point interface between the purchaser and the contractor on all matters concerning the contract.

Drawings
Detailed blue prints will be required in the bid package. The drawing must be of the chassis and body being bid and must show the following features:

1) Right side of vehicle
2) Left side of vehicle
3) Top of vehicle (showing interior layout)
4) Rear of vehicle

Detailed blue prints and written specifications will be approved by the purchaser prior to any metal being sheared or cut for the unit. The purchaser, manufacturer's representative and the apparatus manufacturer will each have a copy of this blue print and specifications. Upon purchaser's approval, this print and specifications will become a part of the total contract. Drawing will show, but is not limited to, such items as the chassis being utilized, lights, sirens, all compartment locations and dimensions, special suction, discharges, etc. Blue print will be a visual interpretation of the unit as it is to be supplied.

Delivery
Delivery and pickup of the apparatus to the Lake Crystal Fire Department will be made after the inspection and acceptance at the manufacturer’s facility, unless prior arrangements are made with the sales engineer and/or manufacturer.

Pre-Construction Meeting
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A pre-construction meeting shall be held at the manufacturing facility at which time any questions or clarifications as to the details of specifications, construction and delivery shall be resolved.

**Inspections**
There will be allowed an inspection trip to the manufacturing facility for up to four (4) department personnel. These costs shall be covered by the successful bidder and will include any travel expenses, meals and lodging. The following trips will be allowed per this proposal;

1) Pre-delivery inspection

**Instruction Manuals/Drawings, Schematic**
In accordance with standard commercial practices, applicable to each vehicle (including body and special equipment) furnished under the contract, the following listed manuals and schematics, in the quantity specified, will be provided at time of delivery of each vehicle. The contractor will supply at time of delivery, at least one copy of a complete operation and service manual covering the complete apparatus as delivered and accepted. The manual will contain the following:

A) Descriptions, specifications, and ratings of chassis.
B) Wiring diagrams
C) Lubrication charts
D) Operating instructions for the chassis, any major components and any auxiliary systems.
E) Instructions regarding the frequency and procedures recommended for maintenance.
F) Parts replacement information

**Vehicle Fluids Plate**
As required by N.F.P.A., the contractor will affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle: A permanent plate in the driving compartment will specify the quantity and type of the following fluids used in the vehicle:

A) Engine oil
B) Engine coolant
C) Chassis transmission fluid
D) Pump transmission lubrication fluid
E) Pump primer fluid
F) Drive axle(s) lubrication fluid
G) Air-conditioning refrigerant
H) Air-conditioning lubrication oil
I) Power steering fluid
J) Cab tilt mechanism
K) Equipment rack fluid
L) Generator system lubricant

**Principle Apparatus Dimensions & G.V.W.R.**
The principle dimensions of the completed apparatus will have the following approximate dimensions:

- OVERALL LENGTH: 381” (31’ 9’’)
- OVERALL WIDTH: 98” (8’ 2’’)
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- OVERALL HEIGHT: 127 ½” (10’ 7 ½”)
- MAXIMUM HOSE BED HEIGHT: N/A

The axle and total weight ratings of the completed apparatus will not be less than the following minimum acceptable weight ratings:

- MINIMUM FRONT G.A.W.R.: 8,000 lbs.
- MINIMUM REAR G.A.W.R.: 17,500 lbs.
- MINIMUM TOTAL G.V.W.R.: 25,500 lbs.

Chassis Modifications

Cab Console/Command Desk
There shall be a console installed in the chassis cab portion of the apparatus to the immediate right of the driver steering wheel and gauge cluster for mounting the emergency switch panel and siren. The console and desk shall be constructed from smooth aluminum. The forward dash area of the cab shall remain as is from the van OEM and used for radio’s, siren and miscellaneous equipment.

There will be a command desk installed at the passenger side dash of the apparatus. The desk shall be a box type compartment with a hinged lid that can be used as a command desk. The exact layout of the command desk area will be determined at the pre-construction meeting.

Kussmaul Pump Plus 1000 Super Kit
There shall be installed one (1) Kussmaul Pump Plus 1000 Super Kit, model 091-9-1000-S-KIT, on the apparatus. The Pump Plus 1000 Super Kit consists of one (1) Auto Pump 12V air compressor, one (1) Pump Plus 1000 battery charger/conditioner, one (1) Super Auto Eject shoreline inlet and one (1) Auto Charge indicator. This Pump Plus 1000 Super Kit will keep the chassis air system, batteries and components at a charged and ready state while connected to the shoreline inlet. The Super Auto Eject shall allow the shoreline cable to be automatically ejected from the vehicle upon activation of the chassis starter. The Super Auto Eject is made up of a completely sealed box with a snap tight cover to prevent corrosion to hamper the performance of the Auto Eject. The Super Auto Eject shall be supplied with a “Red” cover.

The Auto Eject receptacle shall be mounted in the flat surface near the driver’s door of the chassis. The charge indicator shall be mounted to the immediate right side of the Super Auto Eject receptacle. The exact location will be determined at a later date due to the sliding driver’s door.

120-Volt Receptacles (Interior)
There shall be seven (7) 120-volt, 15-amp duplex straight blade household receptacles installed on the apparatus. The outlets shall be located at the apparatus body interior at the customer specified locations. The outlets shall be powered by the 120-volt shoreline inlet and the on-board power inverter.

Powerstrips
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There shall be three (3) 120-volt 6-position powerstrips supplied and installed on the apparatus. The powerstrips will be located at the customer specified locations. The powerstrips shall be powered from the shoreline inlet and the on-board power inverter.

Air Horns
There shall be a set of Hadley Emergency Style Stuttertone air horns installed at the sides of the engine hood of the apparatus. The air horns shall be plumbed to the truck’s air system with nylon tubing and a pressure protection valve. The horns shall be activated with a floor mounted foot switch at both the driver’s side and passenger side.

Radio Antenna
There shall be a two-way radio antenna installed through the roof of the chassis cab towards the rear. The antenna shall be customer supplied and delivered with the customer’s chassis for installation.

12 Volt Power Wires
There shall be one (1) set of 12-volt power and ground wires located on the apparatus. The wires shall be terminated in the cab of the apparatus near the front dash/console. The wire shall be labeled by the manufacturer and this wire shall be used for radio installation at a later date by the radio installation company.

Wheel Chocs
There shall be one (1) set of Ziamatic, model SAC-44, wheel chocks with horizontal underbody mounts supplied and installed on the apparatus body. The chocs shall be mounted behind the left rear wheels.

Back Up Alarm
There shall be installed one (1) back up alarm wired to reverse gear on the transmission by the van manufacturer that will be utilized by the final stage manufacturer.

Chassis Exhaust
The chassis exhaust shall be properly extended with exhaust pipe, elbows, and clamps to a position directly ahead of the left rear wheel by van manufacturer that will be utilized by the final stage manufacturer.

Rear Mudflaps
There shall be heavy-duty rubber mudflaps installed behind each front and rear wheels.

Tow Eyes
There shall be a set of tow eyes at the rear of the body that are attached to the frame rails and finish off just above the rear step. The tow eyes shall be made from 3/4” x 4” steel with a 2” x 4” oval eye center. The tow eyes will be finish painted black and the tow eyes shall have stainless steel trim rings around them.

There will also be a set of tow hooks supplied and installed at the front of the apparatus bolted to the frame rails with minimum grade 5 bolts. These tow hooks will be finish painted black.
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Helmet Security
There shall be provisions installed in the chassis cab to secure the firefighters helmets. These provisions shall prevent the helmets from being projectiles in the event of an accident.

Tire Pressure Monitoring System
There shall be a tire pressure monitoring system installed on each of the apparatus wheels to monitor the air pressure in each wheel. The sensor shall be a valve stem mounted device, similar to a valve stem cap, manufactured from chrome plated brass material.

The sensor shall be set to the tire pressure of the wheel when installed onto the wheels valve stem for pressure ratings up to 120PSI.

Apparatus Body

Anti-Corrosion Protection
No dissimilar metals shall contact each other. All stainless-steel screws shall have a nylon washer under their heads and the threads shall be coated with a non-hardening isolating material. All fasteners shall be stainless steel. This isolating material shall also be used behind all lights, grab handle brackets and equipment mounts to reduce the chances of corrosion at these locations. No pop rivets shall be used in the construction of the body and or doors. No Exceptions.

Exterior Body Compartments
The exterior body compartments shall be constructed of 1/8" smooth aluminum and shall be inserted into the van body thru a cutout hole. The compartments will be supplied with a sweep out floor design. All compartments shall have louver panels installed at the back walls for adequate ventilation. All compartments shall be finished with a protective type coating for scratching, scuffing resistance, and for appearance. Each compartment shall have lighting installed to illuminate the compartment during low light and dark conditions.

Compartment Doors
The compartment doors shall be constructed entirely from aluminum using a flush type configuration 1 5/8" door with 1/8" diamond plate inner panel fastened to the door with stainless steel fasteners. Two (2) ¼" holes shall be installed in the lower corners of the inside door pans for drainage. There shall be a “hat stake” section inside each door to enhance the overall strength and durability of the doors. Doors shall be fully weather stripped with hollow core tubular automotive “D” type material. The compartment doors shall have a double catching two-point safety slam heavy duty stainless steel latches, rectangular paddle type with rubber gaskets for electrolysis protection, recessed inside the 1 5/8" thick double pan door. Latches shall meet strength requirements for passenger doors as specified in the Federal Motor Vehicle Standard. The doors shall be securely attached to the apparatus body with full-length 16 gauge stainless steel piano type hinges with stainless steel pins and fasteners. (Pop Rivets shall NOT be used for attaching compartment doors to the apparatus body.) All horizontally hinged doors shall have a stainless-steel catch to hold the doors open at or near 180-degrees.

External Compartment Layout
(Compartment sizes are approximate sizes and may change with the chassis style, body style, and cab to axle distance.)
Driver’s Side Compartments

**L1**- The first lower skirting compartment ahead of the rear wheels shall be equipped with a horizontally hinged lift-up door with a stainless-steel catch to hold the door open at or near 180-degrees. The approximate size of the compartment shall be 60" wide x 16" high x 26" deep.

**L2**- The second lower skirting compartment ahead of the rear wheels shall be equipped with a horizontally hinged lift-up door with a stainless-steel catch to hold the door open at or near 180-degrees. The approximate size of the compartment shall be 60" wide x 16" high x 26" deep.

**L3**- The lower skirting compartment behind the rear wheels shall be equipped with a horizontally hinged lift-up door with a stainless-steel catch to hold the door open at or near 180-degrees. The approximate size of the compartment shall be 60" wide x 16" high x 26" deep.

**Passenger Side Compartments**

**R1**- The first forward lower skirting compartment ahead of the rear wheels shall be equipped with a roll up door. The approximate size of the compartment shall be 60 ½" wide x 31" high x 26” deep. This entire compartment will be an SCBA bottle storage rack.

**R2**- The second forward lower skirting compartment ahead of the rear wheels shall be equipped with a roll up door. The approximate size of the compartment shall be 60 ½" wide x 31” high x 26” deep. This compartment will be supplied with a small SCBA bottle storage rack and a floor mounted slide out tray.

**R3**- The compartment behind the rear wheels shall be equipped with an aluminum roll up door. The approximate size of the compartment shall be 60" wide x 84" high x 26” deep. This compartment will be supplied with two (2) vertical slide out tool boards at the rear portion of the compartment. There will be a pegboard vertical divider at the center and a pegboard panel at the left (rear) wall of the compartment. To the right of the divider will be one (1) 300lb floor mounted slide out tray and two (2) adjustable shelves.

**Roll Up Compartment Door (Painted to Match)**
The roll up doors shall be supplied with a painted finish and have a double faced, aluminum construction. Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of the door. Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist dirt and weather from entering the compartment. The seals shall be made of Santoprene. All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. A polished stainless-steel lift bar shall be provided for opening the door. The lift bar shall be located at the bottom of the door and shall have latches on the outer extrusion of the doors frame. A ledge shall be supplied over the lift bar for an additional area to aid in closing the door. The doors shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat and the interior surfaces shall be concave to provide strength and to prevent equipment from jamming against the door at the inside. The spring roller assembly shall not exceed 3” in diameter to conserve space in the compartment. The...
header panel for the roll up door shall not exceed 4" in height. There shall also be heavy-duty magnetic switches installed for activating the compartment lights and the “open compartment indicator light” in the cab.

Compartment Matting
There shall be modular plastic floor matting installed at the bottom of each compartment, tray, and shelf in the apparatus body. The matting shall allow air to move freely around equipment in the compartments to help prevent mold and mildew from forming on or around equipment.

Adjustable Shelf Tracking
There shall be one (1) pair of adjustable tracking installed in each compartment on the apparatus. The tracking will allow for the provisions of adjustable shelves immediately or in the future.

Adjustable Shelf
There shall be two (2) adjustable shelves provided on the apparatus. The shelves shall be located in the R3 compartment ahead of the vertical divider. The shelves shall be constructed of smooth aluminum with a bend at the front and rear in opposite directions to provide a strong rigid shelf. The shelves shall be installed on adjustable tracking with bolts that slide in the tracking to allow adjustment by the department to accommodate their needs of storage.

Slide Out Tray
There shall be two (2) slide out trays installed at the R2 compartment floor behind the bottle rack and R3 compartment floor, ahead of the vertical divider, of the apparatus with a 300 lb capacity in the extended position. The slides shall be durable slide with an aluminum tray with 2” sides that lock in the “In” and “Out” positions with a gas shock at the bottom of the tray. There shall be alternating Red/White 2” reflective striping installed around the perimeter of the tray at each side for enhanced safety of the apparatus.

Vertical Divider
There shall be one (1) removable vertical divider installed on the apparatus body at compartment R3. The approximate location of the divider shall be determined at the pre-construction meeting. The divider shall be made from 1/8” smooth aluminum and shall be supplied with a pegboard layout, ¼” holes on 1” centers, and painted to match the compartment interiors.

Aluminum Pull Out Tool Board
There shall be two (2) aluminum pull out tool boards installed on the apparatus in the R3 compartment to the rear of the vertical divider. The tool boards shall be made from .125” smooth aluminum and shall be supplied with hand pull cut outs at the front of the board. The boards shall be mounted, top and bottom, floor and ceiling, and held open or closed with a pressurized gas strut. The tool board shall be as deep as possible and adjustable from side to side. The tool boards shall be supplied with ¼” holes on 1” centers throughout the whole aluminum sheet, unless otherwise specified. There shall be alternating Red/White reflective striping installed around the perimeter of both sides of the tool board for enhanced safety of the apparatus.

Peg Board
The rear end wall of compartment R3 of the apparatus shall be supplied with a peg board tool board/panel. The peg board shall be fabricated from 1/8” smooth aluminum material and shall be
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spaced off the wall with nylon spacers. The board will be supplied with ¼” holes on 1” centers throughout the entire board.

SCBA Bottle Rack
There shall be a spare bottle rack installed in compartments R1 and R2 for spare SCBA bottles. The bottle rack shall be constructed from 1/8” smooth aluminum and spatter painted to match the interior of the compartment. The bottom of the bottle rack shall be tapered slightly toward the rear and the floor shall be rubber lined to both protect the bottles and help hold them in place. There shall also be rubber bumpers installed at the end of each bottle sleeve to protect the end of the bottle from damage.

Automatic Door Step
There shall be one (1) retractable vehicle step installed onto the apparatus body. The step shall be located under the passenger side entry/exit door on the apparatus body. The step shall be wired to the chassis 12-volt electrical system for operation and shall activate upon setting the parking brake of the apparatus chassis. The step shall be 23 ¾” wide x 10 3/8” deep with a 7” drop non-skid stepping surface with a 300lb capacity.

Intermediate Rear Step
There shall be an intermediate rear step directly below the rear door opening of the body. This step will split the difference in half between the door opening and the main rear bumper/step. This step will be fabricated from embossed aluminum diamond plate.

Awning
There shall be a 12-volt electrically operated awning supplied and installed at the passenger side of the apparatus body. The awning shall be mounted onto the top of the body at the passenger side of the apparatus body. The awning shall be located to the front of the body and will be 22’ long. The unit will be mounted with satin finished hardware and stainless-steel fasteners. The awning color shall be determined at the time of order.

Fenderettes
There shall be installed a black rubber fenderette which is bolted to the body if it needs to be removed or replaced.

Body Interior

Body Interior
The floor of the interior of the apparatus shall be overlaid with a rubber mat flooring with a diamond plate thread pattern. The floor perimeter and any seams shall be sealed with a color matching sealant.

The interior walls and roof shall be insulated with Styrofoam insulation and lined with .25” thick plywood, which has a fiberglass bead board type, covering. The bead board shall be white in color for illumination and cleanup purposes. The corners and seams shall be trimmed with white plastic trim molding.

Front Interior
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**Interior Storage Cabinets**
There shall be storage cabinets installed at the upper front interior of the apparatus body above the windshield. The cabinets shall be made from 1/8" smooth aluminum equipped with sliding Lexan doors. The cabinets shall be “DA” style finished aluminum. There will be two (2) doors, evenly spaced, installed in these storage cabinets.

**Drivers Side Interior**

**Gear Storage Lockers**
There shall be turnout gear storage lockers fabricated and installed at the driver’s side of the apparatus body interior. There shall be twenty-two (22) located ahead of the rear wheel wells and four (4) to the rear of the rear wheel wells for a total of twenty-six (26) half lockers. Each locker shall be approximately 40” tall x 16” wide x 24” deep. There shall be a 3” air gap/channel between the upper and lower compartments. This air gap shall be sealed except for ventilation holes that go into each locker for air flow from a Saber Vent ventilation fan. There shall be a channel that is routed between the two (2) sets of lockers (if possible) between the refrigerator and lower storage drawers above the driver’s side wheel wells. The locker floors shall be a solid piece of 1/8” smooth aluminum to prevent dirt, moisture and debris from falling into the area below each locker. The sidewalls of all the lockers shall be fabricated from 1/8” smooth aluminum, which is punched with diamond shaped holes in a continuous series to form an expanded type aluminum material. There will be a 10” personal item shelf installed at the upper rear of each locker 6” from the top. There shall also be three (3) “J” type hooks installed into each locker, one (1) each side and one (1) at the back wall. A Chief’s compartment shall be provided behind front passenger seat.

**Slide Out Tray Storage**
There shall be slide out storage trays/compartment installed to the immediate rear of the front lockers and above the driver side wheel well. There will be two (2) evenly sized slide out trays/compartment in the space provided. The slides shall be 300lb ball bearing slides and the trays/compartment will be fabricated from 1/8” smooth aluminum and painted white. This storage provision will be approximately 40” high off the floor of the interior with a brushed stainless-steel top for the mounting of the refrigerator and open shelf space.

**Refrigerator**
There shall be a 2.7 cubic foot two-way 120-volt/12-volt refrigerator installed to the top of the slide out storage compartment provisions at the passenger side interior of the apparatus. The refrigerator shall be operated off of 120-volt power while the truck is plugged into the shoreline and off the chassis 12-volt electrical system when not plugged into the shoreline. The refrigerator shall be 29 ¾” high x 20 ½” wide x 21 3/8” deep.

**Open Storage**
There shall be open storage in the remaining space between the rear set of lockers and the rear wall of the interior. This storage area will be provided with four (4) adjustable height shelves. The opening will be supplied with two (2) separate black nylon webbings, one (1) upper and one (1) lower. These will retain equipment in the storage provisions.

**Passenger Side Interior**
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Open Storage
There shall be open storage in the space between the front bulkhead wall and the SCBA seating. This storage area will be provided with three (3) adjustable height shelves. The opening will be supplied with black nylon webbing to retain equipment in the storage provisions.

Seating
There shall be four (4) SCBA seats located at the passenger side front corner of the apparatus starting directly behind the front body bulkhead. The seats shall be mounted to the top of an interior fabricated seat base. The seats shall be mounted at a height of 22” from the floor. The seats shall be supplied with Freightliner Gray Vinyl upholstery and shall have a SCBA type seat backs attached to the base of the seat. The SCBA brackets shall be NFPA compliant for crew compartments with restraint strap. Each seat shall be supplied with red seat belts with the proper wiring in the seat for connection to the seat belt monitoring system in the cab. There shall be a bright red warning label stating the total number of personnel to be seated at this location.

Seating
There shall be two (2) SCBA seats located at the passenger side directly behind the side entry/exit door provision and above the rear wheel wells. The seats shall be mounted to the top of an interior fabricated seat base. The seats shall be mounted at a height of 22” from the floor. The seats shall be supplied with Freightliner Gray Vinyl upholstery and shall have a SCBA type seat backs attached to the base of the seat. The SCBA brackets shall be NFPA compliant for crew compartments with restraint strap. Each seat shall be supplied with red seat belts with the proper wiring in the seat for connection to the seat belt monitoring system in the cab. There shall be a bright red warning label stating the total number of personnel to be seated at this location.

Interior Storage Cabinets
There shall be storage cabinets installed at the passenger side interior of the apparatus body above each SCBA seating provision and over the rear exterior compartment provision. The cabinets shall be made from 1/8” smooth aluminum equipped with sliding Lexan doors. The cabinets shall be “DA” style finished aluminum. There will be a minimum of two (2), evenly spaced, storage cabinets installed at each location.

Electrical System

Wiring
All electrical equipment shall be installed to conform to modern automotive practices. All wiring is to be SXL ultra-high temperature cross-link type. Wiring installed by the builder to be run in loom or conduit, where exposed to the outside, it should have grommets where the wire passes through a metal plate and shall be protected by automatic reset circuit breakers which conform to SAE standards. The breakers shall be selected to prevent wire damage when subjected to extreme overload. Wiring to be color, function, and number coded every 3”, the entire length of run.

All electrical components to have a 125% maximum rating for current carried.

Master Battery Switch
There shall be a master battery, on-off, switch located near the driver location. This switch shall be wired to the chassis battery system to allow the system to be turn off when the vehicle is not in
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use. There shall be a green indicator light located next to the switch and shall automatically turn on when the battery system is activated.

Master Switch Panel
All electrical light switches shall be mounted on the cab console by means of a custom switch panel. It shall be accessible to the driver and the officer. A Main Master Switch and individual switches to be provided to allow pre-selection of emergency and scene lights.

The light switches are to be "rocker" type with an internal indicator light to show when the switch is energized. All switches to be properly identified and mounted in a removable panel for ease in servicing. A backlit panel shall be used to identify the switches when it's dark.

Each rocker switch shall energize a 40-amp continuous duty relay. Each relay shall be labeled as to its function.

Two (2) wiring diagrams for 12 VDC and/or 120/240 VAC, the body electrical system shall be included with the apparatus as built.

The electrical junction box for all 12-volt wiring shall be located in a convenient location. It shall have a hinged aluminum diamond plate access panel. All components in the compartment shall have identification tags.

Key Management System
The apparatus shall be equipped with a Key Management System for controlling electrical system devices. This management system shall be capable of performing loan management functions, system monitoring and reporting, and be fully programmable for a standardized electrical system.

The Key system shall utilize a Controller Area Network to provide multiplexed control signals for "real time" operation.

Interior 12-Volt Lighting
There shall be a total of ten (10) 12-volt LED light strips installed in the ceiling of the apparatus body. There shall be five (5) clear light strips and two (2) blue LED light strips. The clear strips will be evenly installed in the rear and one (1) above the command area at the passenger side front of the cab. There will be one (1) blue strip installed above each seating area. The lights shall be actuated with an individual switch for each color light at the command desk switch panel.

Step Lights
There shall be five (5) LED step lights installed on the apparatus at various locations. There shall be one (1) at each of the cab and body entry/exit door steps, one (1) at the rear entry door and two (2) at the rear step of the apparatus. The exterior lights shall be automatically activated when the parking brake is set. The interior lights at the step wells shall automatically activate upon opening the door. The lights shall be chrome plated shielded LED lights.

Stop, Tail, Directional Lights
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There shall be installed two (2) sets of three (3) Whelen C6 LED stop/tail, directional, and back up lights at the rear outer most location. The red brake/tail lights shall be model C6BTT, the amber turn signals shall be model C6T and the clear backup lights shall be model C6CS. The lights shall be wired to the chassis electrical system for operation. These lights shall be mounted in chrome plated housings.

License Plate Bracket and Light
There shall be a license plate bracket and light installed above the rear step and just to the inside of the left side taillight cluster.

Midship Marker Lights
There shall be a pair of LED amber midship marker and turn indicator lights installed on the apparatus. The lights shall be wired to the chassis marker lights for operation.

Clearance Lights/Reflectors
The clearance lights shall be supplied on the apparatus from the van manufacturer.

Open Compartment Door Indicator Light
There shall be a Red LED “open door” indicator light mounted in the cab where the driver can see it. This is to alert the driver that there is a door open or ajar on the apparatus. This light is wired to all of the door switches.

Compartment Lights
There shall be two (2) LED compartment light strips, one (1) each side of the compartment door openings, wired to a door switch. Upon opening the compartment door the lights automatically come on.

Ground Lights
A total of eight (8) LED ground lights are to be installed under the apparatus body. There shall be one (1) light located under each of the cab and side entry/exit steps, two (2) each side under the front of the apparatus body ahead of the rear wheels, two (2) lights under the apparatus body under the rear compartments and two (2) lights located under the rear step area at or as near the center of the step as possible. These ground lights will be activated upon setting the parking brake.

Flood/Spot Surface Mount Lighthead (Scene Lights)
There shall be eight (8) scene lights provided, three (3) each side, one (1) at the upper front, middle and rear of the body sides and two (2) at the upper rear body panel, one (1) each side. The 76 watt +12v DC single lighthead shall incorporate Super-LED® combination flood/spot light installed in ABS resin surface mount housing. The surface mount housing will be chrome plated. The configuration shall consist of 12 white Super-LED®s for the spot light with a specialized spot reflector on the bottom, 24 white Super-LED®s in the flood light with a clear optic collimator/metalized reflector assembly on the top, and a clear non-optic polycarbonate lens. The flood/spot light shall have 7,800 usable lumens. The combination optic design projects light directly down at 5° and producing illumination to the side of the vehicle arching upward to a 90° pattern of light.
The lens assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The hard-coated lens shall provide extended life/luster protection against UV and chemical stresses. The flood/spotlight shall be vibration resistant. The PC boards shall be conformal coated for additional protection. One breathable membrane patch shall be installed on the rear of the housing to maintain a consistent internal pressure. The flood/spotlight shall have extended LED operation with low current consumption and low operating temperature.

The flood/spotlight shall be furnished with a 2’ 2/C 18GA unterminated Heyco® cable, and be SAE 1113-42 compliant and Class 5 testing for EMI and covered by a five-year factory warranty. The flood/spotlight shall have built-in nylon screw grommets eliminating galvanic corrosion. The flood/spotlight shall have a uniquely designed molded two-part silicone grommet to seal the 1” wire entry into the body.

Voltage: +12v DC
Size: H=6.37”, W=8.97”, D=1.72
Amp Draw: 6 Amps
Lens Color: Clear

The rear lights shall be wired to reverse gear of the transmission so the light automatically comes on when the truck is shifted to reverse gear. The lights shall also be wired to the in-cab switch panel and be activated with an individual switch for the lights.

**Telescopic LED Floodlights**

There shall be four (4), LED floodlights side mount push up telescopic lights installed, two (2) at the passenger side, one (1) forward side wall and one (1) at the rear bulkhead of the apparatus body and two (2) at the driver side, one (1) forward side wall and one (1) at the rear bulkhead of the apparatus body. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 3 1/2” offset. Wiring shall extend from the pole bottom with a 4’ retractable cord.

The lamphead shall have four (4) ultra-bright white LEDs. It shall operate at 12/24 volts DC, draw 7.5/3.75 amps, and generate 8,000 lumens. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall incorporate heat-dissipating fins and be no more than 5 3/16” deep by 3 5/16” high by 7 5/8” wide. The lamphead and mounting arm shall be powder coated white. The floodlight shall be for fire service use.

**Back Up Camera**

There shall be a Hanscom K, model HC-082509, flat screen back up camera system with three (3) cameras installed with audio capabilities. The 7” colored monitor is approximately 1” thick which makes it easy for mounting in various locations. The monitor shall be mounted in the cab per the fire department specified location. There shall be one (1) video camera mounted on the rear wall of the apparatus body in a location that will provide the best angle of the ground and the area behind the truck. There shall also be one (1) camera each side of the cab on the front fenders facing the rear of the apparatus that view the sides of the apparatus. The side cameras shall be
activated with the turn signal of that particular side of the vehicle and will also be capable of being activated by switching channels on the cab monitor. The camera shall be provided with a shield to protect the camera from damage.

**Warning Systems**

(All warning systems will be provided as per NFPA 1901 requirements.)

**Siren & Speaker**

There shall be installed one (1) Whelen or Federal electronic siren amplifier mounted in cab where both driver and passenger can reach, it shall be wired to the cab electrical system. There shall also be installed one (1) Whelen or Federal, 100-watt weatherproof speaker recessed into the front bumper and wired to the siren amplifier and to the cab electrical system.

**Light Bar-LED (Red, Clear)**

There shall be one (1) Whelen or Federal 90” LED light bar mounted on the front face of the cab above the windshield on a custom mount and wired to the in-cab switch panel. The light bar shall have four (4) red forward-facing LED modules, two (2) clear forward facing LED modules and two (2) red front corner LED modules of the light bar. This light bar fulfills the requirements for Upper Zone A. The light bar lenses shall be clear in color.

Any clear warning light(s) in the light bar will be deactivated automatically for the “Blocking the Right of Way” mode with the “Parking Brake” control.

**Grille and Intersection Lights- LED Flashers (Red)**

There shall be two (2) grille lights installed at the front of the cab in the grille area, one (1) each side, and two (2) intersection lights installed, one (1) each side of the hood. The lights shall be Whelen or Federal LED model flashers.

There will also be an additional Whelen or Federal, White LED flasher with clear lens, installed at the center of the grille of the chassis. This light will be deactivated upon setting the parking brake.

The lights shall be wired to the in-cab switch panel. These lights shall fulfill the requirements of Lower Zone A.

**Rear Warning Lights- LED Flashers (Red)**

There shall be four (4) Whelen or Federal LED flashers installed at the rear of the apparatus body. There shall be two (2) flashers mounted one (1) each side above stop, turn, and tail light cluster and two (2) flashers one (1) each side at the upper rear facing corners. These lights shall be wired to the in-cab switch panel, and shall fulfill the requirements of Lower and Upper Zone C.

**Side Warning Lighting- LED Flashers (Red)**

There shall be eight (8) Whelen or Federal LED flashers mounted four (4) on each side. There shall be one (1) on each side at the rear wheel wells and one (1) each side at the ends of the tailboard. There shall be two Whelen or Federal (2) each side one (1) in each upper corner, side facing. The lights shall be wired to the in-cab switch panel. These lights shall fulfill the requirements of Lower and Upper Zones B and D.
Traffic Advisor
There shall be a Whelen, or Federal, 6-light LED directional light installed at the upper rear bulkhead of the apparatus body above the rear door. There shall be a control head located in the cab of the apparatus for activating the directional light. All lenses shall be Amber in color.

120-Volt Electrical

Inverter
The apparatus will be equipped with a Kussmaul model SP-3000 Inverter to provide 120-volt electrical power to the apparatus and components. The inverter will be a Pure Sine wave inverter that is fan cooled. The inverter is supplied by the 12-volt chassis electrical system and will be capable of producing 3000-watts of continuous power with a surge output of 6000-watts. The inverter will be provided with an optional remote on/off switch with indicator lights. The exact mounting location of the inverter and to which power outlets power will be provided to will be determined at the pre-construction meeting.

Circuit Breaker Panel
There shall be a circuit breaker panel for the inverter located at the customer specified location on the apparatus body. There shall be breakers supplied on the panel for the lights and outlets on the apparatus body. The breakers shall be properly labeled to their function in manner that they will provide years of service.

Paint/Misc.

Paint Code:
The apparatus body, where needed for touchup and compartment cutouts/inserts, shall be painted one (1) solid color per fire department specifications using PPG ESSS Polyurethane base coat/clear coat paint. The painting process shall follow the PPG painting process by PPG certified applier.

- All items such as brackets, compartment doors, door hinges, and diamond tread aluminum plate, etc. should be removed from the apparatus or body.
- Entire unit should be solvent washed using a two (2)-rag method using CFX436/330 Wax and Grease Remover.
- The welded areas on the entire unit should be ground down with a 36-grit disc for steel, and 80 grit discs for aluminum. Compartment seams and others not receiving the grinding process should be wire wheeled. All surface area then should be DA sanded using 120 grit then 180 grit on steel or Galveneal. On aluminum use 150-180 grit. Filling should be done where necessary with professional grade lightweight polyester resin filler. Presanding the polyester filler is recommended.
  - Final sanding should be done no courser than 180 grit.
- Entire unit should be solvent washed using a two (2)-rag method using CFX436/330 Wax and Grease Remove prior to priming.
- The unit will be Epoxy Primed with ESU 421, mixed with ESU 428 hardener and ESR 300 thinner. A minimum number of coats, 1-2, for a 1.5-2.0 MIL thickness. After a flash time of
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10-15 minutes ESU 440 High Build primer surfacer mixed with ESU 4492 ESX 510 to be applied per PPG specifications. Minimum of 2-3 coats for a 3.0-6.0 dry MIL thickness.

- Sanding should be accomplished using 320 grit until all scratches are removed.
- Upon completion of the sanding procedure, all non-welded seams should be caulked with a compatible urethane caulk that is non-hardening and remains flexible during any atmospheric condition.
- After the unit is hand washed with CFX436/330 Wax and Grease Remover using the two-rag method, and tack wipe remaining lint to remove any surface partials.
- Prior to final paint and after sanding with 320 grit, all bare aluminum, steel or stainless-steel will be cleaned with CFX436/330 Wax and Grease Remover and resealed with ESU 421 Epoxy Primer prior to paint.
- PPG ESSS Polyurethane basecoat paint will be mixed with ESH210 Hardener and ESB800 BC Converter. A minimum of 2 coats will be applied or until “hiding” is achieved, 1.5-3.0 MIL thickness. Let dry.
- After a dry time of 30-45 minutes the unit will be clear coated with ESU621 Urethane mixed with ESH200 Hardener and ESR300 thinner. Two (2) full wet coats will be applied to a minimum of 2.0-4.0 MIL thickness. Let dry.
- Unit should be allowed to dry 24 hours prior to buffing and 7-days prior to the applying decals/lettering/striping.

Compartments
The inside of the apparatus compartments shall be sprayed with a white base coat and oversprayed with gray and black spatter paint. The compartments shall be finished with a clear coat finish for greater durability and ease in cleanup.

Undercoating
The inside and the underside of the apparatus body shall be sprayed with a rubberized vehicle undercoating to protect the body from corrosion.

Lettering
The lettering on the apparatus body shall be gold reflective with black shadow and outline and installed per fire department requirements to match their existing apparatus. (There shall be a picture supplied by the department of the lettering and striping to the salesperson or to the manufacturer.)

Reflective Stripe
There shall be applied one (1) 6” Gold Scotchlite straight stripe with ¼” black outline at each side of the apparatus cab and body. There shall also be a reflective stripe installed at the front of the apparatus below the cab grille area, where applicable.

There shall be reflective striping installed on the inside of the cab doors per NFPA regulations, minimum of 96 square inches each door.

At the rear of the apparatus body the entire rear panel and rear door shall be covered with alternating 6” Red and Yellow reflective material in an inverted “V” Chevron pattern. This shall also be 3M Scotchlite material for maximum reflectivity at the rear of the apparatus.
Danger Plates
There shall be supplied and installed “Warning/Danger” plates on the apparatus.

There shall be one (1) plate installed in the cab within view of the driver stating the maximum number of passengers in the cab of the vehicle.

There shall be one (1) plate installed in the cab within view of the driver stating the overall height, overall length and GVWR of the completed apparatus.

There shall be one (1) plate installed in the cab and in the command enclosure within view of all passengers stating; “DANGER-personnel must be seated and seat belts must be fastened while vehicle is in motion or Death or Serious Injury May Result”.

There shall be one (1) plate installed at the rear of the apparatus body stating; “DANGER-do not ride on rear step while vehicle is in motion or Death or Serious Injury May Result.

There shall be one (1) plate installed in the cab within view of all seating locations stating: “Helmets must not be worn in the apparatus while vehicle is in motion.”

*Note: Any additional loose equipment items outlined in NFPA 1901 section 10.5 will be customer supplied and installed on the apparatus before the unit is placed into service.