



# MAINTAINER CUSTOM BODIES

## PROPOSAL

Customer Name: CITY OF SPRINGFIELD (MO) BID 056-2018

Quote Number: DBW0055

Quote Date: 10/20/2017

### BID SPECIFICATIONS

#### MAINTAINER CUSTOM BODIES SPECIFICATION NEW ALL-ALUMINUM THIRTEEN (13) FOOT RESPONDER WALK-AROUND BODY

**THE APPARATUS BODY SHALL BE MANUFACTURED AS PER THE FOLLOWING SPECIFICATIONS:**

**BODY DESIGN:**

The body shall be modular in design, capable of being removed and remounted on a new chassis. Body integrity and strength to be independent of chassis mounting. Body is specifically designed to enable custom layout of interior compartments.

**BODY MATERIALS:**

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

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

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

Body Mounting - All body mounting bolts to be minimum Grade 5 and/or clips to be of hardened steel.

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

**CORROSION PROTECTION:**

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

**BODY SUPER-STRUCTURE:**

The body super-structure shall be constructed of square aluminum extrusion. All framing and supports shall be welded using an inert gas automatic welder. Completion of super-structure creates a fully enclosed cage. This construction technique provides high strength and durability and enables custom design of interior compartments.

The floor structure, built on 16-inch centers, shall be constructed of 2.0" x 2.0" x .250" 6063-T52 alloy square aluminum extrusion. Floor structure shall be a welded grid design for maximum strength and durability. The floor structure shall be welded and gusseted to the side-wall structure. Two (2) mounting rails of full-length 1.0" x 3.0" 6061-T6 alloy solid aluminum flat-bar shall be welded to the under-side of the floor-structure. Mounting rails to align with the chassis frame rails for mounting of the body to the chassis.

The side-wall structure, built on 16-inch centers, shall be constructed of 2.0" x 2.0" x .125" 6063-T52 alloy square aluminum extrusion. Wall structure shall be a welded grid design for maximum strength and durability. The side-wall structure shall be welded and gusseted to the floor structure.

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

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



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A structural body impact rail shall be welded to the apparatus body structural members. This impact rail shall be composed of 6063-T52 alloy extruded aluminum. It shall receive the body side sheet by means of a groove, which runs continually fore to aft of the module for maximum strength and impact protection.

#### **BODY FLOOR CONSTRUCTION:**

Floor sub-frame consists of 2.0" square aluminum tubing running transverse to the chassis frame rails. Two (2) mounting rails of full-length 1.0" x 3.0" 6061-T6 alloy solid aluminum flat-bar shall be welded to the under-side of the floor-structure. Mounting rails to align with the chassis frame rails for mounting of the body to the chassis.

The sub-floor belly-pan shall be fabricated from .090" aluminum sheeting and welded to the floor sub-frame.

#### **UNDERCOATING:**

The underside of the vehicle including all under-structure metal work shall be sprayed with black automotive undercoating. This undercoating shall aid in preventing corrosion and will provide sound and vapor barriers to the aluminum body structure work.

#### **BODY MOUNTING:**

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

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

#### **FRONT BODY SHEET:**

The entire front of the apparatus body shall be constructed of .125" aluminum diamond plate.

#### **STONE GUARDS:**

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

#### **BODY REAR SHEETING:**

The rear body sheet shall be fabricated of .125" smooth aluminum sheeting. The area under the rear door and above the rear step shall include an overlay of .125" aluminum diamond plate. This will serve as a kick plate to protect the painted surfaces.

#### **BODY ROOF SHEETING:**

The body roof sheet shall be fabricated of .125" aluminum diamond plate.

#### **BODY CORNERS, EXTRUDED:**

The exterior body corners, including roof perimeter, shall be covered with rolled extruded aluminum, minimum 2.78" radius, to protect from physical and environmental damage. No visible fasteners shall be allowed.



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#### **APPARATUS BODY PAINT FINISH:**

The final finish of the apparatus shall conform to fire apparatus standards, exhibiting excellent gloss and color retention properties.

Preparation: Since the removal of all contaminants and oxidation is essential to the final effect of a finish system, the apparatus shall be pre-cleaned with wax and grease remover and towel dried to evaporation. A 10-step standard body preparation shall be completed.

Pre-treat ANF Primers: The pre-treat and primer applications shall be made in two (2) independent steps. An application of a combined pre-treat/primer product shall not be allowed as a substrate. The prepared substrate shall be pre-treated with Acid Curing 2 component primer to provide corrosion protection and create an adhesive bond between the substrate and the surface applications. To enhance adhesion and topcoat gloss, a two-component urethane primer shall be applied. All the primed surfaces shall be sanded smooth, thus removing all texture and surface imperfections and creating a finish base that will meet the rigid requirements of the fire and emergency services.

Top Coats: Paint shall be PPG FBCH. Two (2) coats urethane base coat shall be applied according to paint manufacturer specifications. After the base coats have cured properly, two (2) coats of a high solids urethane clear shall be applied. All surface imperfections shall be removed by buffing and polishing.

#### **RE-PAINT CHASSIS:**

The chassis interior and exterior shall be completely stripped and shall be re-painted as required to match the specified color number.

The chassis, rescue body, and wheels shall be a single paint color. Paint code is PPG 70853. A paint confirmation chip to be supplied to customer for approval.

#### **REFLECTIVE STRIPE:**

A four-inch (4") white "Scotchlite" stripe will be provided. Location and application details to be determined at pre-construction meeting.

#### **REAR BODY CHEVRONS:**

"Diamond Grade" Chevron reflective striping, six inch (6") wide, shall be applied to at least 50% of the entire rear body panel. The chevron style striping shall be applied in an inverted "V" pattern at a 45-degree angle from the tailboard to the upper centerline of the rear panel. The stripes shall alternate red reflective, yellow reflective.

#### **CAB DOOR REFLECTIVE TRIM:**

White reflective trim shall be installed on the inside of each cab door. The reflective trim shall be installed as to not be seen or disruptive from the inside of the cab while the doors are closed but shall provide additional notification to oncoming traffic when the door is open. Cab Door Reflective Material: Reflective red and fluorescent yellow/lime green diamond grade striping shall be supplied on each of the cab doors. The stripes shall be angled from the lower outer corner to the upper inside corner, forming an "A" shape when viewed from the rear. The reflective material shall be at least 96 This trim shall meet NFPA 1901.

#### **RUB RAILS:**

A two (2) part impact and rub rail system shall be used for body side protection. A polished aluminum rub rail .75" thick x 3" wide shall be bolted to the body "impact" rail to aid in collision protection. The outside vertical edges shall be chamfered for an aesthetic appearance and to reduce the chance of personnel injury.



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

#### **DRIP RAILS:**

There shall be polished aluminum rain gutters installed over all side and rear compartments and any entry doors. The rain gutters shall be fastened to the body and removable in case of damage.

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

#### **WHEEL WELL LINERS:**

Welded aluminum inner liners shall be provided at both rear wheel wells.

#### **WHEEL WELL TRIM PANELS:**

Aluminum diamond plate shall be installed on the wheel well body panels to protect the paint from scratches. It shall extend from the base of the wheel well panel up to the bottom of the compartment over the wheel well.

#### **FENDERETTES:**

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

#### **BODY COMPARTMENT CONSTRUCTION:**

The body compartment shall be fully enclosed, all seams fully sealed. Compartment walls shall be covered with .125" aluminum sheet. Wiring channels shall be provided where necessary and these shall be bolted in place for ease of access. Each compartment floor shall be covered with .188" aluminum sheet for added weight carrying capability. Each body compartment shall be coated with light gray Zolatone surfacing material.

#### **EXTERIOR COMPARTMENT VENTING:**

Each compartment shall have a removable louvered panel with a replaceable filter.

#### **COMPARTMENT DOOR CONSTRUCTION:**

Each swing door shall be constructed of reinforced .125" aluminum sheeting and shall be approximately 2" thick. THE USE OF EXTRUSIONS IN THE CONSTRUCTION OF THE DOORS SHALL NOT BE ALLOWED. Doors shall be insulated with polystyrene foam insulation.

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

The doorjamb shall have weather-stripping on all four sides

The doors shall be flush mounted to prevent the gaskets from freezing to the body exterior.

The inner door panel shall be constructed of 18 gauge brushed stainless steel and shall be bolted to the outer skin of the door. A magnetic type switch, integral to the door, shall be supplied for door ajar indication and compartment light activation.

### **EXTERIOR COMPARTMENT SPECIFICATIONS**

#### **DRIVER'S SIDE:**

The front driver's side compartment, L1, shall have a clear opening of 57" H x 45" W x 21" D (lower) with vertically hinged double doors. This shall be a transverse compartment.



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The compartment over the rear wheels on the driver's side, L2, shall have a clear opening of 32" H x 44" W with vertically hinged double doors. This shall be a transverse compartment.

The driver's side compartment behind the rear wheels, L3, shall have a clear opening of 54" H x 35" W x 21" D with vertically hinged double doors.

#### **OFFICER'S SIDE:**

The front officer's side compartment, R1, shall have a clear opening of 57" H x 45" W x 21" D (lower) with vertically hinged double doors. This shall be a transverse compartment.

The compartment over the rear wheels on the officer's side, R2, shall have a clear opening of 32" H x 44" W with vertically hinged double doors. This shall be a transverse compartment.

The officer's side compartment behind the rear wheels, R3, shall have a clear opening of 54" H x 35" W x 21" D with vertically hinged double doors.

#### **REAR:**

There shall be a compartment located at the rear of the body, RR1, which shall have a clear opening of 35" H x 42" W x 44 3/4" D with vertically hinged double doors.

#### **REAR: (Upper Ladder Storage)**

There shall be a compartment located at the rear of the body, RR1, which shall have a clear opening of 8" H x 19" W x 101" D with a horizontally hinged doors.

Each door shall have stainless steel "D" handle latches, which will activate series rotary locks via a threaded stainless steel rod with yoke end. There shall be a turnbuckle installed on the rod for easy adjustment. The rotary locks shall be mounted on the top and bottom of both doors and shall be mounted within the door pan. **DOORS THAT USE A SINGLE POINT, SINGLE CATCH LATCH WILL NOT BE PERMITTED.**

On the inside of each entry door shall be a stainless steel paddle and tray type handle.

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

Door handles shall be "Eberhard" series paddle type.

The handles shall be constructed of stainless steel. The handles shall actuate an "Eberhard" series rotary latches via a threaded stainless steel rod with yoke end. There shall be a turnbuckle installed on the rod for easy adjustment.

#### **ADJUSTABLE SHELF CHANNEL:**

Vertically mounted Uni-Strut channel shall be provided and installed in all exterior compartments for the installation of infinitely adjustable shelving and trays. The channels shall be of such design to allow square type spring loaded, self-tightening nuts to be attached inside of the channel. Each of the uni-strut shelf channel segments shall be welded in place.



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#### COMPARTMENT L1 SHALL CONTAIN:

##### SLIDE OUT TRAY:

An OnScene 86 Series "medium duty" slide out tray shall be fabricated and installed in the compartment. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 500 pounds and shall be mounted on OnScene slides. A red latch on the front of the slide shall lock the tray in the "in" or "out" position. Note: The 86 Series is an external mounting configuration ONLY.

##### FLOOR EXTENSION:

Floor height at the area over the frame rails to be continued on the same plane to the outer body side-wall. Floor extension shall be fabricated of 3/16" smooth aluminum in the form of an inverted box with a 2" lip to create additional support strength.

##### ADJUSTABLE SLIDE OUT TOOL BOARD:

An adjustable vertical tool board(s) shall be provided and installed. Each board shall be fabricated from 3/16" smooth aluminum. The board(s) shall be left a natural oscillated finish design. . A hand pull cut out, trimmed with black molding shall be provided on the front face of the board. Each board shall be mounted on one (1), OnScene Series 85 1000-pound capacity slide at the bottom and one (1) slide-out guide at the top. latch on the front of the slide shall hold the tray in the "in" or "out" position. The tool board(s) shall be horizontally adjustable by mounting in heavy duty C channel tracking material, securely fastened in the compartment.

#### COMPARTMENT R1 SHALL CONTAIN:

##### SLIDE OUT TRAY:

An OnScene 86 Series "medium duty" slide out tray shall be fabricated and installed in the compartment. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 500 pounds and shall be mounted on OnScene slides. A red latch on the front of the slide shall lock the tray in the "in" or "out" position. Note: The 86 Series is an external mounting configuration ONLY.

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#### **TRANSVERSE COMPARTMENT L1/R1 SHALL CONTAIN:**

##### **PAC TRAC TOOL MOUNTING SURFACE**

The rear wall of the transverse compartment will incorporate the PAC TRAC tool boards versatile mounting surface for PAC brackets. The PAC TRAC surface will completely cover the rear wall from Left to right & top to bottom. Once panels are installed, PAC brackets can be installed without drilling holes. Brackets can be relocated and reoriented easily. Brackets are attached to PAC TRAC with proprietary PAC TRACLOK inserts, PAC channel nuts, or standard Uni-strut channel nuts.

#### **COMPARTMENT L2 SHALL CONTAIN:**

##### **ADJUSTABLE SHELF:**

One adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

#### **COMPARTMENT R2 SHALL CONTAIN:**

##### **ADJUSTABLE SHELF:**

One adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" DA finished aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

**TRANSVERSE COMPARTMENT L2/R2 SHALL CONTAIN:** No options installed.

#### **COMPARTMENT L3 SHALL CONTAIN:**

##### **SLIDE OUT TRAY:**

An OnScene 86 Series "medium duty" slide out tray shall be fabricated and installed in the compartment. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 500 pounds and shall be mounted on OnScene slides. A red latch on the front of the slide shall lock the tray in the "in" or "out" position. Note: The 86 Series is an external mounting configuration ONLY.

#### **COMPARTMENT R3 SHALL CONTAIN:**

##### **SLIDE OUT TRAY:**

An OnScene 86 Series "medium duty" slide out tray shall be fabricated and installed in the compartment. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 500 pounds and shall be mounted on OnScene slides. A red latch on the front of the slide shall lock the tray in the "in" or "out" position. Note: The 86 Series is an external mounting configuration ONLY.

#### **COMPARTMENT RR1 SHALL CONTAIN:**

##### **SLIDE OUT TRAY:**

An OnScene 86 Series "medium duty" slide out tray shall be fabricated and installed in the compartment. The tray shall be constructed from 3/16" smooth aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 500 pounds and shall be mounted on OnScene slides. A red latch on the front of the slide shall lock the tray in the "in" or "out" position. Note: The 86 Series is an external mounting configuration ONLY.



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#### **COMPARTMENT RR2 SHALL CONTAIN: Ladder Storage Compartment**

##### **SCBA WHEEL WELL STORAGE:**

There shall be individual SCBA bottle storage areas provided in the rear wheel well area. The air bottle compartments shall be in the form of a round tube and of adequate depth to accommodate air bottles. Each storage area shall have a rubber liner on the sides and bottom and a drain hole. A strap shall be installed in each cylinder tube to retain the cylinder in the event of a collision. A Cast Products polished aluminum hinged door with a chrome latch shall be provided for each compartment.

Two (2) SCBA storage tubes will be located in the officer's side rear wheel well.

##### **BODY HANDRAILS:**

Handrails shall be 1.25" extruded aluminum tubing with deep longitudinal grooves and raised knurled patterned knobs to allow for a non-slip gripping surface. Each handrail shall have heavily chrome plated end stanchions with stanchion to body gaskets to prevent dissimilar metal corrosion. Each handrail shall be bolted into place for ease of removal or replacement.

Two (2) handrails will be installed, one (1) on each side of the rear compartment door.

##### **ELECTRICAL SYSTEM - BASE:**

All wiring and electrical equipment shall meet N.F.P.A. 1901 and SAE standards. All lighting and reflectors shall meet Federal Motor Vehicle Standards.

A master warning device switch that energizes all of the optical warning devices shall be provided.

The warning system on the apparatus shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right of way. The other mode shall signal that the apparatus is stopped and is blocking the right of way.

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

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

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





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Wiring grommets shall be provided through all panels for automotive type wiring with coated automotive type loom. Insulation shall be in accordance with SAE J1128, low tension primary cable, type SXL or GXL, and wired to SAE J1292, Automobile, Truck, Truck-Tractor, Trailer and Motor Coach wiring for such loading at the potential employed. All wiring installed by the Apparatus Manufacturer shall be stranded copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. Wiring shall be color and function coded the entire length with insulated bolted-down type hold-down clamps and mechanically secured connections. Overall covering of conductors shall be 280 degrees F. Minimum flame retardant, moisture resistant loom.

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

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

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

#### **ELECTRICAL SYSTEM:**

There shall be a Weldon V-MUX Multiplexed Electrical System installed. The multiplex system shall consist of all solid-state components contained inside aluminum extrusions referred to as nodes. Each node shall consist off twenty-four (24) output channels and twenty-four (24) input channels. All inputs and outputs shall be configured into a scale-able electrical harness utilizing Deutsche connectors. The nodes must be waterproof and not require special mounting requirements.

The system is expandable and shall be capable of performing the following functions: load management sequencing, switch loads and receive digital and analog signals. The placement of nodes throughout the apparatus enables a reduction in wire harness bundles, elimination of redundant harnesses and separate circuit boards, relay and circuit breakers, electrical hardware, separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

The complete multiplex system shall eliminate the need for the following separate components or devices: load manager, load sequencer, warning lamp flasher, headlamp flasher, door open notification system, interlock modules, separate volt meter, ammeter and temperature monitor. Carling rocker-type switches shall be provided and installed on the cab dash to control all vehicle warning and scene lights. Each switch shall have a function label for ease of use.

#### **POWER DISTRIBUTION QUARTERS:**

The vehicle shall be equipped with a sealed Power Distribution Quarters (PDQ) to provide a protected environment for the electrical systems interface to the apparatus body. The PDQ shall have a service access door that is removable via two (2) recessed positive type door latches. 12v lighting shall automatically activate with the removal of the access door. The compartment and access door shall be fabricated from 5052-H32 aluminum alloy, finished to match with interior compartments, and include venting for heat dissipation.



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The design shall provide a standardized platform for reliable and repeatable hard-wired or multiplexed electrical systems that can be documented and easily serviced and maintained. The electrical distribution panel shall incorporate wiring harnesses that meet or exceed NFPA standards while providing a central location for body wiring harnesses, as well as a centralized point for chassis harness interface.

All harnesses entering and exiting the distribution panel shall pass through a protected wiring channel directly into the PDQ to eliminate connectivity issues common with bulkhead connectors. Internal wiring terminals shall be machine or torque-tool crimped to the wire ends and splices shall be protected with heat shrink material.

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

#### **BATTERY CONTROL SYSTEM, IGNITION SWITCH:**

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

#### **BATTERY CHARGER:**

A Kussmaul Auto Charge Low Profile LPC 20 Series Model #091-207-12 shall be installed for a single battery system. The charger shall include a Model #091-194-IND "Status Center" exterior digital display. Charger to be built in an aluminum enclosure and include an auxiliary 15-amp output circuit with power source selector for operating accessory loads, and front panel connections for a remote display. Charger output shall pose no interference with other electronic systems on the vehicle.

The charger shall have the following operational specifications: 120-volts AC input at 7-amperes, 12-volts DC output at 20-amperes, dimensions of: 3.3" high x 6.8" wide x 13.25" deep and weighs 7 lbs.

#### **KUSSMAUL 120-VOLT SUPER AUTO EJECT:**

Kussmaul Super Auto Eject, model 091-55-20-120, 20 amp, automatic shoreline disconnect will be provided for the on board, 120-volt battery charging system. The disconnect will be equipped with a NEMA 5-20P male receptacle, which will automatically eject the shoreline when the vehicle starter is energized. The connection will be equipped with a weatherproof cover. A label will be provided indicating voltage and amperage ratings.

#### **COMPARTMENT STRIP LIGHTING:**

ROM V4 LED compartment lights shall be supplied, lights shall be located on (left, right, both) sides of each compartment door opening. Lights shall be designed and manufactured to be water proof meeting the IPX7 industry standard. Lights shall have a streamline optic lens and a fixed lumen output across 9-16vdc and produce a bright 250 Lumens per 12 inch section (nominal).

LED lights shall draw no more than 0.33 amperes at 12.8vdc per 12 inch section of light strip. LED lights shall be mounted in an anodized aluminum track provided by ROM either as a standalone unit or an integrated part of the roll up shutter door track. LED lights shall be of interlocking design and shall be able to be serviced/replaced without the removal of the light extrusion assembly or shutter door. LED lights shall be able to be integrated with any door switch control wired either negative switching or positive switching. ROM LED lights have a 7 year product warranty.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel.



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#### **"DOOR OPEN" WARNING LIGHT:**

A red LED warning light, Weldon 1500 Series, shall be installed on the cab console and shall flash when any compartment door is open.

#### **E-Q2B ELECTRONIC SIREN:**

A Federal e-Q2B 200-watt electronic siren shall be installed. The siren shall produce the sound of the original Q-2B with the functionality of an electronic siren with PA. The siren controls shall be located in the cab within easy reach of the officer and driver. The 200 watt speaker, model BP200-EF, shall be recessed in the front bumper.

#### **SPEAKER SYSTEM:**

There shall be a Federal Signal model BP200-Q 200-watt siren speaker installed and wired to the e-Q2B electronic siren. The speaker will have Chrome grille that simulates the look of Federal Q2B electro-mechanical siren. Siren will be recess mount in the front bumper.

#### **SIREN FLOOR SWITCH:**

The siren shall be actuated by two (2) foot switches mounted on the floor; one (1) located on the officer's side and one (1) located on the driver's side.

#### **SPEAKER SYSTEM:**

There shall be two (2) Code 3 100-watt speakers, model PB100B, with black finish mounted in the front bumper. The speakers shall be connected to the siren amplifier.

#### **AIR HORNS:**

Two (2) Grover model 1510 Stuttertone air horns shall be installed. Horns shall be plumbed to the chassis air system. A pressure protection valve shall be provided in the air line that feeds the horns and prohibits the use of the air horns if the air system drops below 80 psi. Air horns will be installed in the front bumper. One (1) each side of the e-Q2B siren speaker.

#### **AIR HORN COMPRESSOR**

A Grover model 1167 12-v. air compressor will be provided and installed. The compressor will supply 80-100 psi for operating air horns. Compressor will be plumbed to air tank.

#### **UTILITY AIR TANK, 3-GALLON:**

Viking Horns V1005AT 3 Gallon Air Tank with 6 ports

Storage: 225 psi max

Construction: Metal housing black painted

Tank Dimensions: 23-1/2" Long, 7-1/2" High (with brackets), 6-1/2" diameter (without brackets)

#### **FRONT LIGHT BAR:**

One (1) Whelen Freedom IV series LC 60" lightbar model F4N0RRBB will be provided installed on the forward section of the cab roof using Whelen MKEZ7 permanent roof mount brackets. It will be an fully populated all LED configuration consisting of: four (4) corner Linear LEDs two (2) red and two (2) blue; six (6) forward facing linear LEDs, three (3) red and three (3) blue and four (4) forward facing white LED's, 2 (two) centered each side, left & right All outer lenses will be clear.

#### **FRONT LOWER WARNING LIGHTS:**

There shall be two (2) Whelen M6 series Super LED lights with chrome bezels installed on the front lower area of the cab. One (1) red and one (1) blue.



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#### **SIDE LOWER WARNING LIGHTS:**

There shall be Whelen M6 series Super LED lower warning lights installed on the vehicle.

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

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

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

#### **WHELEN PFP2 DUAL PANEL RECESSED LED SCENE LIGHT-FRONT UPPER**

There shall be two (2) Whelen Pioneer Plus™ Model # PFP2 provided and installed in the upper front body face. One (1) in each upper outside corner of the body. The 168 watt +12v DC Pioneer light head shall incorporate Super-LED® dual flood light installed in a die-cast white powder coated aluminum housing. The PFP2 configuration shall consist of 60 white Super-LEDs with a clear optic collimator/metalized reflector assembly and a clear non-optic polycarbonate lens. The Pioneer flood light shall have 16,000 usable lumens.

The lens/reflector 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 PFP2 shall be vibration resistant. The Pioneer™ PC boards shall be conformal coated for additional protection. Two breathable membrane patches shall be installed to the bottom of the housing to maintain a consistent internal pressure. The PFP2 shall have extended LED operation with low current consumption and low operating temperature.

The PFP2 shall be furnished with a 20' 4/C 16GA input cable. The Pioneer shall have the ability to flash as a secondary warning light in the "Clearing Right of Way" mode when installed with an external flasher, model number PFLASH, purchased separately. The Pioneer light shall be SAE 1113-42 compliant and Class 5 testing for EMI. The PFP2 is covered by a five year factory warranty. Mounting options are purchased separately.

The floodlights will be mounted in the Whelen PBA203 semi-recessed housing with the chrome flange. The lamp can be focused straight out or at 15 degrees down-tilt. Housing color TBD.

The light shall be switched respectively at the cab console.

#### **SIDE UPPER WARNING LIGHTS:**

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

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

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

One(1) Blue forward and one (1) Red rearward. Each side.

#### **WHELEN PFP2 DUAL PANEL RECESSED LED SCENE LIGHT-UPPER SIDE**

There shall be four (4) Whelen Pioneer Plus™ Model # PFP2 installed. Two (2) on each upper side body panel. One (1) forward and one (1) rearward. The 168 watt +12v DC Pioneer light head shall incorporate Super-LED® dual flood light installed in a die-cast white powder coated aluminum housing. The PFP2 configuration shall consist of 60 white Super-LEDs with a clear optic collimator/metalized reflector assembly and a clear non-optic polycarbonate lens. The Pioneer flood light shall have 16,000 usable lumens.



### BID SPECIFICATIONS

The lens/reflector 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 PFP2 shall be vibration resistant. The Pioneer™ PC boards shall be conformal coated for additional protection. Two breathable membrane patches shall be installed to the bottom of the housing to maintain a consistent internal pressure. The PFP2 shall have extended LED operation with low current consumption and low operating temperature.

The PFP2 shall be furnished with a 20' 4/C 16GA input cable. The Pioneer shall have the ability to flash as a secondary warning light in the "Clearing Right of Way" mode when installed with an external flasher, model number PFLASH, purchased separately. The Pioneer light shall be SAE 1113-42 compliant and Class 5 testing for EMI. The PFP2 is covered by a five year factory warranty. Mounting options are purchased separately.

The floodlights will be mounted in the Whelen PBA203 semi-recessed housing with the chrome flange. The lamp can be focused straight out or at 15 degrees down-tilt. Housing color TBD.

The light shall be switched respectively at the cab console.

#### **REAR UPPER WARNING LIGHTS:**

There shall be four (4) Whelen 600 series Super LED rear upper warning lights with chrome bezels installed on the vehicle. The light will be Red LED's with a Red lens.

Two (2) lights shall be mounted in each of the upper outside corners, one (1) above the scene lights and one (1) below the scene lights, on each side.

#### **MICRO PIONEER LIGHTHEAD WITH RECESS MOUNT**

Two (2) Whelen Micro Pioneer™ Model # MPR15B recessed LED lighthouse shall be provided and installed on the upper rear body panel. One (1) light will be installed on each side. The 45 watt +12 DC Micro Pioneer lighthouse configuration shall incorporate 12 white Super-LED® with a TIR reflector installed in a black die-cast powder coated aluminum housing. The MPR15B shall have a standard 8° spot light lens and have the ability to change the optics with three different flood light pattern lenses provided with the Micro Pioneer. The MPR15B shall include a black aluminum alloy recess mount with a chrome accent flange. The Micro Pioneer light shall be installed at a 15° angle in the recess housing. The recess housing shall be made of extruded sheet metal with welded joints and black powder coating. The MPR15B shall include a neoprene gasket and stainless steel hardware. The Micro Pioneer light shall have 4,100 usable lumens.

Lights will be switched on the operators switch panel.

#### **REAR TURN SIGNAL, BACK-UP AND BRAKE LIGHTS:**

The rear turn signal, backup and stop/tail lights shall be a Whelen M6 series LED four (4) light cluster.

The brake light shall be a Whelen M6 series Super LED red combination stop/tail light.

The rear turn signal shall be a Whelen M6 series LED amber turn signal.

The backup light shall be a Whelen M6 series LED white back-up light.

The bottom light shall be a Whelen M6 series LED red flashing warning light.

This four (4) light cluster shall be mounted in a "Cast" housing. One (1) cluster shall be mounted on the right and one (1) cluster on the left rear of the body.



### BID SPECIFICATIONS

#### **LED CLEARANCE LIGHTS:**

Nine (9) clearance lights, Weldon 1500 Series, seven (7) red and two (2) amber, shall be installed to meet ICC, FMVSS and other applicable regulations. LED Low Amp Draw Marker Lamps, 1.1" X 2.59" with 0J10-1200 with isolating pad and stainless steel brush guard for added durability.

#### **LED UNDERBODY LIGHTS:**

There shall be eight (8) TecNiq Series E10-WS00-1 white LED under body lights installed under the cab doors and as required under the sides and rear of the body. Lights shall be mounted with a Stainless Steel bracket and activated when the vehicle transmission is in park/neutral and the vehicle park/ headlights are active.

Additionally, the ground lights shall be controlled by the work light switch in cab that is accessible by the driver.

#### **LICENSE PLATE BRACKET WITH LIGHT:**

There shall be a license plate bracket with light supplied and mounted at the rear of the apparatus.

#### **CHASSIS RELATED ACCESSORIES**

##### **CAB CONTROL CONSOLE:**

There shall be one (1) cab control console installed in the chassis between the cab bucket seats. This console shall be fabricated from .125" aluminum and shall be as large as possible and bolted into place. This console shall have a removable top cover plate, which shall be retained by stainless steel counter-sunk fasteners.

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

The console shall be coated with Light Gray or Black Onyx Zolatone to aid in abrasion resistance. Color to be determined.

##### **PRE-WIRED ANTENNA CABLES:**

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

##### **USB PORT, DUAL, KUSSMAUL**

One (1) Kussmaul # 091-219-WP dual USB charging port shall be provided in the center console area allowing for quick and easy way to recharge electronic devices in the apparatus. High capacity 3-amp maximum output allows charging of both a smart phone and tablet at the same time. Built-In LED Indicator indicates device is powered. To include a weather-proof cover.

##### **REAR STEP AND BUMPER:**

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

The bumper structure shall be attached to the chassis frame rails using a minimum of 3" structural channel. The bumper and step assembly shall extend beyond the rear of the modular body approximately 11" to protect the body from damage.

The rear step shall be constructed of an open aluminum grip strut material.



### BID SPECIFICATIONS

**TRAILER HITCH:**

One (1) Class V trailer hitch shall be installed on the rear of the rescue vehicle. The trailer hitch shall include an electrical connection.

**BACK-UP ALARM:**

There shall be an electronic back-up alarm with momentary cut off switch installed, activated when the chassis is shifted into reverse.

**TRAILER LIGHT CONNECTOR:**

A 9-pin/4-pin trailer plug connector wired to the tail lights shall be provided and installed under the rear bumper. Power shall also be provided for the trailer brakes.

**RUNNING BOARDS:**

Treadbrite running boards shall be installed on the unit under the cab and crew area doors on both sides of the chassis.

**STEP LIGHTS:**

There shall be four (4) Whelen OS Series #0AC0EDCR white LED step lights provided. There shall be one (1) light installed at each cab and crew door, one (1) light per door step. The lights shall be activated when parking lights are activated and the transmission is in the Park position.

Additionally, the step lights shall be controlled by the work light switch in cab that is accessible by the driver.

**FUEL FILL DOOR:**

A flush mounted fuel filler guard with a hinged door shall be installed over the fuel fill hose. The opening shall be labeled DIESEL FUEL ONLY engraved on a permanently attached label.

**DIESEL EXHAUST FLUID FILL DOOR:**

A flush mounted fuel filler guard with a hinged door shall be installed over the diesel exhaust fluid fill. The opening shall be labeled DIESEL EXHUST FLUID with a permanently attached label.

**TIRE PRESSURE MONITORING DEVICES:**

The apparatus shall be equipped with an AirGuard LED tire alert pressure management system. When tire is properly inflated, the indicator inside the cap shall be clear. The sensor shall activate an integral battery operated LED when the pressure of that tire drops by 8 psi or more. Valve stem extensions shall be included on outer rear wheels. Sensors to be shipped loose for installation by customer.

**CHAIN, IGNITION KEY:**

A chassis ignition key shall be chained to the dash panel to prevent accidental removal.

**BACK UP CAMERA:**

A Fire Research inView TrueSight model BCA121-A00 rear and side vision kit shall be provided and installed. The kit will include: one (1) 130° rear vision camera with 18 infrared illuminators, one (1) 120° right hand side-angle camera and one (1) seven-inch (7") digital in-cab monitor. Location of the 130° camera and 7" digital monitor to be determined.

**BUMPER EXTENSION:**

The front bumper of the unit shall be extended. The chassis frame shall be extended forward by the use of frame rail extensions. The top and sides of the bumper extension shall be covered with polished aluminum diamond plate. The OEM bumper shall be replaced.



### BID SPECIFICATIONS

#### **STEEL CHANNEL FRONT BUMPER**

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be steel which shall measure approximately 12.00 inches high with an approximately 3" inch flange and shall be approximately 99" inches wide with angled front corners. The bumper shall be primed and painted as specified.

#### **FRONT BUMPER GRAVEL SHIELD**

A 3/16" polished aluminum diamond plate gravel shield shall be provided and installed on top of the extension in the area between the cab and the bumper extension.

#### **TOW EYES - REAR:**

There shall be two (2) tow eyes attached directly to the chassis frame rail below the rear of the unit. One (1) each side.

#### **MUD FLAPS - REAR:**

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

#### **WARNING LABELS AND INFORMATION PLATES:**

All operator controls and switches shall have the appropriate label and corresponding bezel such as pump discharge controls, electrical connections, fuel/DEF fill and exterior switches, etc. Labels to be manufactured by Innovative Controls.

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

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

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

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

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

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

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

There shall be a label provided in the cab made visible to everyone in the cab "warning" "Helmets are not to be worn in cab and safely secured".





### BID SPECIFICATIONS

#### **DELIVERY REQUIREMENTS:**

#### **MANUALS:**

All manuals related to sub-system components for included optional equipment to be provided on a CD at the time of customer acceptance. Two (2) copies.

#### **APPARATUS MANUALS:**

All manuals related to specific construction of the customer apparatus, including electrical and other sub-system components to be provided on a CD at the time of delivery. Manuals to be provided per the media preference of the customer. Two (2) copies.

#### **12 VOLT ELECTRICAL SYSTEM TESTING**

The apparatus low voltage electrical system shall be tested and certified by the apparatus manufacture. The certification shall be provided with the apparatus. All tests shall be performed with air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. NOTE: Before each test, the batteries shall be fully charged.

#### **TEST #1-RESERVE CAPACITY TEST**

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for 10 minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure.

#### **TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE**

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

#### **TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of less than 11.7 volts DC for a 12 volt system, for more than 120 seconds, shall be considered a test failure.

#### **LOW VOLTAGE ALARM TEST**

Following completion of the preceding tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At time of delivery, documentation shall be provided with the following information:



### BID SPECIFICATIONS

Documentation of the electrical system performance test:

A written load analysis of the following;

Nameplate rating of the alternator

Alternator rating at idle while meeting the minimum continuous electrical load

Each component load comprising the minimum continuous electrical load.

Additional loads that, when added to the minimum continuous load, determine the total connected load.

Each individual intermittent load.

### VEHICLE STABILITY (CG) CALCULATION OR MEASUREMENT CERTIFICATION

Vehicle stability or roll stability shall be presented by methods of calculations or measurements per NFPA 1901 – current edition. The calculated or measured center of gravity (CG) shall be no higher than 80 percent of the rear axle track width. The OEM shall utilize supplied documents and information detailing specific equipment and locations for purposes of calculating CG. If no such information is supplied the OEM shall estimate approximate equipment loads based upon the vehicle configuration for such calculations in correspondence with NFPA 1901 required loadings. Upon acceptance of the vehicle, a signed OEM written certification shall be supplied with the fire apparatus before delivery.

### EMERGENCY TRIANGLE KIT:

An emergency kit shall be provided and shipped loose with the completed apparatus. Kit shall include three (3) triangle reflectors.

### FAMA FIRE APPARATUS SAFETY GUIDE:

Fire Apparatus Safety Guide published by FAMA, latest edition shall be provided. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is NOT a substitute for the fire apparatus operator and maintenance manuals or commercial chassis manufacturer's operator and maintenance manuals.

### ELECTRICAL WIRING DIAGRAMS, AS BUILT

Two (2) electrical wiring diagrams, prepared for the body and any options included from the specification, as it was built, and as it interfaces with the vehicle chassis, shall be provided.

### FOLDING LADDER:

A DUO SAFETY 8'-16' foot aluminum folding ladder, model 1275-FR, shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

### DELIVERY AND DEMONSTRATION

Maintainer Custom Bodies shall be responsible for the delivery of the completed unit to the Fire Department's location. On initial delivery of the apparatus, the Contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the Scottsbluff Fire Department regarding the operation, care and maintenance of the apparatus and equipment supplied at Fire Department location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Fire Department.

After delivery of the apparatus, the Fire Department shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment.



### BID SPECIFICATIONS

#### **MCB WARRANTY OVERVIEW:**

##### **BASIC WARRANTY:**

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

##### **STRUCTURAL WARRANTY:**

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

##### **PAINT WARRANTY:**

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

##### **CORROSION WARRANTY:**

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

##### **ELECTRICAL WARRANTY:**

There shall be a two (2) year electrical warranty provided with the completed apparatus.

##### **VEHICLE DELIVERY:**

Delivery of the vehicle to the Fire Department shall be within 150 ALENDAR DAYS from the receipt of the chassis.