



San Bernardino County 10' Hazmat

Quote: 23-169

Date: 7/31/2023

**WARD APPARATUS SPECIFICATION  
NEW ALL-ALUMINUM TEN FOOT (10') HAZMAT RESPONDER 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.

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

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

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

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

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



**BODY CORNERS, EXTRUDED:**

The exterior body corners and roof perimeter shall be capped with a radiused (2.44") custom aluminum extrusion and welded to the wall and roof structure. Body corners create additional protection from physical and environmental damage to the super-structure.

**BODY FLOOR CONSTRUCTION:**

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

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

**UNDERCOATING:**

There shall be no undercoating applied.

**FRONT BODY SHEET:**

The entire front of the apparatus body shall be covered with .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.

Note: Stone guards to be a 2-piece guard.

**BODY REAR SHEETING:**

The rear body sheet shall be fabricated of .125" smooth aluminum sheeting and painted job color. There shall be a kick plate fabricated of .125" aluminum diamond plate, located below the rear opening.

**BODY ROOF SHEETING:**

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

**APPARATUS BODY PAINT FINISH:**

Entire paint process including initial surface preparation through final paint and clear-coat application to be conducted according to PPG certified paint process. The final finish of the apparatus shall conform to fire apparatus standards, exhibiting excellent gloss and color retention properties.

Preparation: Removal of all contaminates and oxidation is essential to the final effect of a finish system, the apparatus shall be pre-cleaned with wax and grease remover and dried to evaporation. A PPG 10-step standard body preparation shall be completed. When the substrate is prepared, the entire body shall be cleaned by washing again with wax and grease remover and dried.

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.

Note: Body to be paint matched to chassis Oxford White OEM paint.

**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.

Note: Provide pre-printed Oralite panels with a clear "safety tape" strip around all edges of the chevrons in lieu of individual striping.

**REFLECTIVE STRIPE:**

A four-inch (4") Red "Scotchlite" stripe will be provided. Location and application details to be determined.

Note: Scotchlite stripe to be 3M-680CR (RED). Striping to be wrapped into the inside edges of all cab doors and body doors. Also wrap striping on the rear of the body around the rear corner up to the edge of the rear chevrons.

**VEHICLE GRAPHICS:**

Install customer supplied cab door decals/graphics.

**DRIP RAILS:**

There shall be polished aluminum rain gutters installed on the side and rear of the body, the rain gutters shall be fastened to the body and removable in case of damage. Rain gutters that are an integral part of the roof radius will not be acceptable due to the difficulty in replacing if damaged.

**RUB RAILS:**

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

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

**WHEEL WELL LINERS, BOLTED SYNTHETIC:**

Bolted synthetic inner liners shall be provided at both rear wheel wells.

**WHEEL WELL SURROUND PANELS PAINTED:**

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



**FENDERETTES:**

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

**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 brushed aluminum hinged door with latch shall be provided for each compartment.

NOTE: Storage for three (3) SCBA bottles to be provided; one (1) street side and two (2) curb side of vehicle.

**BODY MOUNTING:**

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

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

**BODY COMPARTMENT CONSTRUCTION:**

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

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

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

**BODY COMPARTMENT COATING:**

All body compartments shall be fully coated with Zolatone equivalent with matte finish to aid in abrasion resistance.

**BODY COMPARTMENT VENTING:**

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

**DRI-DEK VINYL MATTING:**

All shelves, trays, and compartment floors (where a slide-out tray does not exist on the floor) in the exterior compartments shall be fitted with removable Dri-Dek vinyl matting. The matting shall be interlocking modules approximately 12" square by 1/2" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant. The Dri-Dek design shall aide air ventilation around stored equipment and shall be easily removable for cleaning.



**ADJUSTABLE SHELF CHANNEL:**

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

**COMPARTMENT DOOR CONSTRUCTION:**

Each swing pan-style door shall be constructed of reinforced .125" aluminum sheeting and shall be approximately 2" thick.

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 door jambs shall have gaskets on all four sides. The doors shall be flush mounted to prevent the gaskets from freezing to the body exterior.

NOTE: Hinge pins shall be welded on ONE end only to keep pins securely in place.

The inner door panel shall be constructed of 18-gauge brushed stainless-steel and shall be bolted to the outer skin of the door.

**ELECTRIC COMPARTMENT DOOR LATCH:**

The swing doors on the compartments shall have TriMark 030-1450 series handle latches, which will activate rotary upper & lower locks via a threaded zinc-coated steel rod/cable with yoke end.

There shall be a turnbuckle installed on the rod/cable 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.

The manual locks will be secured and keyed alike with #2001 key. Additionally, each door will have a power actuator. The power actuators will be enabled via a switch in the console.

Note: TriMark ePad door lock/unlock control to be provided and installed. Location of control to be next to the switch panel in a vertical orientation. Electric door locks to include a provision for the door to be unlocked in the case of electric lock failure.

Interior door handles shall be "Eberhard" series paddle type. The handles shall be constructed of stainless steel. The handles shall actuate an "Eberhard" series rotary latch via a threaded zinc-coated steel rod/cable with yoke end. There shall be a turnbuckle installed on the rod/cable for easy adjustment.

The door shall be equipped with a pneumatic strut. When the door is open, the strut shall hold the door open at 90 degrees to the body.



**COMPARTMENT L1 SHALL CONTAIN:**

**FLOOR EXTENSION:**

Floor height at the area over the frame rails to be continued on the same plane to the outer body sidewall. 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 SHELF, BENEATH FLOOR EXTENSION:**

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" sanded finish aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

**COMPARTMENT R1 SHALL CONTAIN:**

**FLOOR EXTENSION:**

Floor height at the area over the frame rails to be continued on the same plane to the outer body sidewall. 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 SHELF, BENEATH FLOOR EXTENSION:**

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" sanded finish 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 L1/R1 SHALL CONTAIN:**

**DUAL DIRECTION SLIDE TRAY:**

A SlideMaster SM2-D 70% extension dual directional slide out tray shall be mounted in the transverse compartment. The tray shall be fabricated from 3/16" sanded finish aluminum and have a 3" lip on all four sides. The tray shall have a capacity of 1,000-pound and be mounted on SlideMaster slides. An IMS push/pull red ball latch on the front of the slide shall lock the tray in the "in" or "out" position.

NFPA compliant reflective striping to be applied to the sides of the tray/tool board that are exposed when in the deployed position.

**TRANSVERSE ADJUSTABLE SHELF:**

A full transverse adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" sanded aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting in eight (8) heavy duty C-channel tracks that are attached to the compartment walls.



**COMPARTMENT L2 SHALL CONTAIN:**

**SLIDE OUT WORK-STATION:**

A SlideMaster SM3-MP 100% extension slide out workstation shall be provided and installed. The workstation shall be constructed from 3/16" smooth aluminum with no outer lips. The steel slides shall have a capacity of 300 pounds. A quarter-turn latch on the front of the slide shall lock the tray in the "in" or "out" position.

NFPA compliant reflective striping to be applied to the sides of the tray/tool board that are exposed when in the deployed position.

Note: Workstation surface to be flat sanded aluminum, designed somewhat like an inverted tray with approximately 1 1/2" lip below the outside edges.

**ADJUSTABLE SHELVES:**

Two (2) adjustable shelves shall be fabricated and installed. The shelves shall be constructed of 3/16" sanded finish aluminum, with a 2" lip on all four sides. The shelves shall be vertically adjustable by mounting to the Uni-Strut channels provided.

**COMPARTMENT R2 SHALL CONTAIN:**

**SLIDE OUT WORK-STATION:**

A SlideMaster SM3-MP 100% extension slide out workstation shall be provided and installed. The workstation shall be constructed from 3/16" smooth aluminum with no outer lips. The steel slides shall have a capacity of 300 pounds. A quarter-turn latch on the front of the slide shall lock the tray in the "in" or "out" position.

NFPA compliant reflective striping to be applied to the sides of the tray/tool board that are exposed when in the deployed position.

Note: Workstation surface to be flat sanded aluminum, designed somewhat like an inverted tray with approximately 1 1/2" lip below the outside edges.

**ADJUSTABLE SHELVES:**

Two (2) adjustable shelves shall be fabricated and installed. The shelves shall be constructed of 3/16" sanded finish aluminum, with a 2" lip on all four sides. The shelves shall be vertically adjustable by mounting to the Uni-Strut channels provided.

**COMPARTMENT L3 SHALL CONTAIN:**

**ADJUSTABLE SHELF:**

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" sanded finish aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.



**COMPARTMENT R3 SHALL CONTAIN:**

**ADJUSTABLE SHELF:**

One (1) adjustable shelf shall be fabricated and installed. The shelf shall be constructed of 3/16" sanded finish aluminum, with a 2" lip on all four sides. The shelf shall be vertically adjustable by mounting to the Uni-Strut channels provided.

**REAR BODY SKID/TANK AREA:**

The body shall be open from the rear body panel to the rear wall of the L1 and R1 compartment(s). Open body area frame will be reinforced to hold the load intended. The interior sheet metal for the floor and side walls will be .188" thick for maximum area structural strength.

The entire area, floor, front wall, and body side walls shall be coated with a Linex lining. The rear center deck edges to the side wall and floor to be trimmed with brushed stainless steel.

**STORAGE AREA COVER:**

A three (3) section telescoping slide cover shall be provided over the center storage area. Cover to be provided with a two (2) section hinged door for enclosing the rear opening of the storage area. Locking mechanism to be provided in both fully open and fully closed positions. Cover to be constructed of aluminum and painted to match the body color. Note: When in the fully open position the entire slide-top cover to travel forward of the center deck opening and rest over the top of the L1/R1 transverse compartment.

**REAR LIFT GATE SYSTEM:**

There shall be one (1) Tommy Gate lift gate system # G2-54-1342 TP27 (or equivalent) provided and installed on the rear of the apparatus for lifting heavy equipment in and out of the body. The lift gate shall be capable of lifting a minimum of 1,300 pounds.

There shall be a wedged platform provided and installed with the liftgate. The platform dimensions shall be 59 3/8" W x 27 1/4"D.

**BODY HANDRAILS:**

Two (2) handrails shall be mounted, one (1) on either side of the rear center deck area. Handrails shall be 1 1/4" extruded aluminum Hansen non-rotating knurled tubing with chrome plated end stanchions. To include stanchion to body gaskets to prevent dissimilar metal corrosion. Each stanchion shall be bolted into place for ease of removal or replacement.

Reference Unit M297 for location.





**ELECTRICAL SYSTEM - BASE:**

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

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

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

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

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

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

Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. Wiring shall be color and function coded the entire length with insulated bolted-down type hold-down clamps and mechanically secured connections. Overall covering of conductors shall be minimum flame retardant to 280-degrees Fahrenheit and moisture resistant.

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.



#### **ELECTRICAL SYSTEM:**

There shall be a Weldon 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 voltmeter, ammeter and temperature monitor. Carling rocker-type switches shall be provided and installed on the center console 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 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.

The design shall provide a standardized platform for reliable and repeatable hard-wired or multiplexed electrical systems that can be documented and easily serviced and maintained. The internal wiring terminals shall be machine or torque-tool crimped to the wire ends and splices shall be protected with heat shrink material. All body harnesses entering and exiting the distribution panel shall pass through a protected wiring channel directly into the PDQ. The electrical distribution panel shall incorporate wiring harnesses that meet or exceed NFPA standards while providing a central location for body wiring harnesses.

The distribution panel, including all circuits, shall be documented and made part of the records available at time of delivery. PDQ to be located beneath the rear seat of the crew cab chassis.

#### **CIRCUIT BREAKER PANEL:**

There shall be a Blue Sea circuit breaker panel installed to house all 120/240-volt circuit breakers. Circuit breakers shall be appropriately rated to wire size and load demand. All circuit breakers shall be labeled as to usage. All circuit breakers shall be switch rated.

Note: To be mounted in the PDQ.



**POWER STRIPS:**

Two (2) ProHT aluminum 6-outlet power strips (or equivalent) shall be provided. Power strip(s) shall be connected to the circuit breaker panel.

Note: Location: One (1) each in the L2 and R2 compartments centered high on the front wall.

**BATTERY CONTROL SYSTEM:**

There shall be one (1) manually operated BEP model 701 battery control switch provided and installed. The switch shall be located on the driver's side of the cab console. There shall be a green "BATTERY ON" pilot light that is visible from the driver's position.

Note: Provide a dimmer switch (APIELE 19mm LED dimmer or equivalent function) to be installed next to the green pilot light to allow the operator(s) to dim light.

**POWER INVERTER/CHARGER, KUSSMAUL:**

One (1) KUSSMAUL 091-263-12-1500 1500-Watt Pure Sine wave inverter with built-in automatic load transfer relay, 55-Amp high output 3-stage charger for rapid battery bank replenishment to be installed. Automatic over temperature shutdown and AC output circuit breaker(s). Automatic low battery shutdown at 10.5VDC with in-rush delay.

Automatically detects when a load is not connected to minimize energy consumption. Heavy duty powder coated aluminum construction and conformal coated circuitry. Built to meet NFPA 1917 Specifications.

Includes 091-200-IND Single bar graph display mounted on the forward upper side of the driver's console.

**BLUE SEA 20A/120V SURE AUTO EJECT:**

A Blue Sea Systems Sure Eject 20A Auto Eject, model 7851, automatic shoreline disconnect will be provided with a Model 7841 contoured female plug for the onboard, 120-volt battery charging system. The disconnect will be equipped with a NEMA 5-15P male receptacle, which will automatically eject the shoreline when the vehicle starter is energized. The connection will be equipped with a white weatherproof cover. A label will be provided indicating voltage and amperage ratings. To be located on front of the body on the driver's side.

**COMPARTMENT STRIP LIGHTING:**

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

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

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



**"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.

Note: Install a dimmer switch (APIELE 19mm LED dimmer equivalent function) to allow the operator(s) to dim the door open warning light during extended periods of time while in the chassis cab in park/idle.

**ELECTRONIC SIREN:**

A Whelen Siren Amplifier model # 295SL101 shall be provided and installed in the cab console. Siren shall include functions: wail, yelp, manual, hands-free, piercer tones, PA and radio-rebroadcast. The siren shall have the ability to drive 100 or 200-watt output. Control to be backlit with soft LED non-glare green lighting. The operating controls will consist of a power switch, manual button, PA volume switch, horn button, rotary switch, and removable microphone. Amplifier to include a 20A/32V fuse.

**SPEAKER SYSTEM:**

There shall be a Whelen, model SA315P composite, 100-watt speaker. Siren speaker to be recessed behind the chassis grille.

**FRONT LIGHT BAR:**

There shall be a Whelen IH2RRRR WC Liberty II light bar with vehicle mounting bracket installed on the vehicle. The light bar shall be 54" long. The light bar will be populated with two (2) front corner red linear LED and (2) rear corner red linear LED. The front will be populated with six (6) front linear LED, four (4) red, 2-long, 2-short and two long white. There will be included a front Opticom, centered with two adjacent take down lights. The rear will be populated with eight (8) linear LED, 6-long and 2-short. The end caps will have two (2) white alley lights. The light bar shall be configured with one (1) steady burn RED LED module as required for California. The far right-hand forward-facing lamp "steady-burn" for CA compliance.

Note: The Opticom emitter shall disengage when chassis transmission is placed in park, neutral, or the parking brake is applied. Reference Unit 227043.

**ROOF MOUNTED SPOTLIGHT:**

One (1) roof mounted Go-Light, model 20204GT, white fully adjustable spotlight shall be mounted behind the light bar on a white pedestal (minimum 3.5"H) in order to clear the lightbar. The light shall be mounted on a pedestal to allow the light to rotate 360° without interference. A hardwired dash mount control to be located on the center console.

**WIG WAG:**

A Code 3 alternating headlight flasher shall be installed on the unit. The headlight flasher shall be weather protected and controlled by a switch on the cab switch console.

**FRONT LOWER WARNING LIGHTS:**

Whelen 500 V-Series™ Model # 5V1R warning light shall be provided. The warning light shall consist of 12 red Super-LED® installed on a V-light PC board with a TIR V-light reflector and six red Super-LED installed on the main PCB board. The red Super-LED on the main PCB board will be installed as three on the left and three on the right of the V-light PCB board. The 5V1R shall have a hard coated optic V-light clear lens with (High Definition Optics) HDO™ technology. The 5V1R will be installed in a black powder coated polycarbonate housing.



Two (2) surface mounted Whelen 5V1R Grill lights 500 V series warning LT RED LED flashing light heads will be provided and will be mounted one (1) each side of the commercial chassis grille. The lower front LED flashing light heads will be equipped with red lenses and a chrome plated flange (5FLANGEC series chrome trim ring, kit).

**SIDE LOWER WARNING LIGHTS:**

There shall be Whelen M2RC series Super LED lower warning lights with chrome bezels installed on the vehicle.

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

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

Clear lens with red LED light

**SIDE LOWER WARNING LIGHTS:**

There shall be Whelen M6R series Super LED lower warning lights installed on the vehicle.

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

Clear lens with red LED light

**SIDE LOWER WARNING LIGHTS:**

Whelen Micron Series Super-LED model MCRNSR shall be provided. The low-profile warning light shall incorporate six red Super-LEDs with a clear optic hard-coated polycarbonate lens and utilize a TIR reflector for maximum output.

Four (4) lights installed, two (2) on each side in the running boards, one (1) below the B pillar and one (1) below the C pillar.

Clear lens with red LED light

**REAR UPPER COMBINATION WARNING AND PERIMETER LIGHT - WHEN M6V2 SERIES**

Whelen M6 Series Model # M6V2R combination 180° warning/perimeter light shall be provided. The M6V2R shall incorporate Linear Super-LED® and Smart LED® technology. The configuration of the M6V2R shall be a M6 V-series red warning light and a perimeter light with a split red/clear non-optic polycarbonate lens. The warning light shall consist of two V-series PC boards containing six red Super-LEDs on each PC board. Clear optic collimators and reflectors will be installed with each PC board for maximum illumination. The perimeter light shall consist of six white Super-LEDs installed on the scene light PC board. The perimeter light shall be installed at 45° angle with a TIR reflector for supreme radiance. The warning light assembly and the perimeter light assembly are installed on a main PC board.

The lens/reflector assembly shall be sealed and 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 light engine shall be installed at the rear of the unit and be vacuum tested to ensure proper sealing. The PC boards shall be conformal coated for additional protection.

Note: The combination warning/scene light with chrome flange to have as the warning light portion, one (1) M6V2R red (driver's side) and one (1) M6V2A amber (passenger side). The lower scene light portion of light to be switched as a pair from the cab console.



**REAR D.O.T. QUAD CLUSTER W/WARNING LIGHT:**

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

Model #M62BTT LED red combination stop/taillight.

Model #M62T LED amber turn signal.

Model #M62BU LED white back-up light.

Model #M6RC LED red warning light.

**REVERSE ACTIVATED REAR SCENE LIGHTS:**

There is no requirement for scene lights to activate in Reverse.

**REAR TRAFFIC DIRECTING LIGHT MODULES:**

Two (2) groups of four (4) rear directing light modules utilizing Whelen MICRON series Amber Super-LED lights shall be installed on the rear of the unit. This split-module design to provide RDL function when the apparatus body has a rear open center deck area. The modules will be mounted at the top of the left and right-side rear compartment walls. A Whelen TACTL5 control shall be mounted in the cab console.

**TELESCOPING 12-V. LED SCENE LIGHTS, SINGLE FLOOD:**

There shall be two (2) PFH1P Pioneer Plus LED Single Panel Floodlights provided and installed on the front body bulkhead, one (1) on the left side and one (1) on the right side.

Each lamp shall operate at 75 watts with White housing, 12-v. DC. Each will be assembled on a Whelen 86930PB4 Side Mount Push-up Pole, 57 inches in length. The (DC) wiring shall exit the bottom of the pole assemble, 12 in. Outer Body, Bottom Collar Placement, Silver, 3 in. Side Mount Bracket, Include Pole Cradle, Include Light Position Sensor to wired to the "Do Not Move Apparatus" indicator in the chassis cab.

**LED CLEARANCE LIGHTS:**

Nine (9) Weldon 1500 Series LED Low Amp Draw Marker Lamps seven (7) Red (Model #9186-1500-10) and two (2) Amber (Model #9186-1500-20), with stainless steel brush guard (Model #0J10-1200-00) shall be installed to meet ICC, FMVSS and other applicable regulations.

**LED UNDERBODY LIGHTS:**

There shall be eight (8) TecNiq Series E10-WS00-1 LED underbody lights mounted on stainless steel brackets.

Two (2) under the cab entry doors, at the "B" pillar, one (1) each side.

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

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

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

The lights shall be activated when the transmission is placed in Park and the Marker lights are on.

**LICENSE PLATE BRACKET WITH LIGHT:**

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

Note: Location to be curb side below the brake/turn 4-light cluster in the kick panel.



**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 Zolatone equivalent material to aid in abrasion resistance.

PreCon Note: Reference previous build unit #227043 that includes hinge at rear of console for easier access to wiring. (Delete Havis Arm Rests) The console shall be coated with Black Onyx Zolatone to aid in abrasion resistance. The radios to be customer installed: 800 radio model: Motorola APX 6500 and VHF radio model: BK KNG-M150

See specific console layout with portable radio inserts, cup holders, etc. Add backing plates below "HT" portable radio slots to prevent radios from falling within the interior of console area below the top plate. Customer to provide portable radio inserts.

Customer requests that the space to the right of the console switches be free of any labels.

Install a "quiet operating" 12V electric fan (equivalent printer/PC fan) on the interior front wall of the console for cooling. Fan to be wired through ignition switch.

**CIRCUIT BREAKER BLOCKS - Non-Bussed**

A Blue Sea Systems provides a compact surface mount solution for push button reset-only circuit breakers. This 6 circuit, non-bussed circuit breaker block feature tin-plated copper screw terminals and an ABYC/USCG approved clear insulating cover with square format label recesses. These blocks have quick connect clips that allow circuit breakers to snap easily into place. Breakouts allow wire access in two directions. Optional push button waterproof boot can be installed over the cover.

Note: Reference console mounting location Unit 227043.

**POWER STRIPS:**

Install one (1) ProHT aluminum 6-outlet power strips (or equivalent) at the bottom of the rear panel of the cab console. The overall width of the power strip to be no wider than the console. Power strip shall be connected to the circuit breaker box.

**PRE-WIRED ANTENNA CABLES:**

There is no requirement for installation of antenna cables.

**USB PORT, DUAL, BLUE SEA**

Two (2) Blue Sea Systems Dual USB Charging Port Model 1045 shall be provided and installed one (1) on each side of the console as far forward and high as possible to prevent contact with driver and officer knees while seated.



**CAB DOME LIGHTS, RED/CLEAR LED:**

There shall be two (2) Whelen 70CREGCS low profile 7" x 3" rectangular LED surface mount dome lights provided and installed. The dome lights shall have six (6) white and six (6) red diode LEDs. Includes two (2) surface mounted switches on the lens face - On/Off White, On/Off Red. The lights to turn on/off with door open/close or otherwise be controlled by on/off switch on the light head.

Note: Mounting location to be overhead of each front seating positions and slightly rearward so that light does not shine directly onto seat occupant. The white LED light segment shall be installed towards the outside of the vehicle and the red LED light segment installed to the inside of the vehicle. See previous build for mounting location.

**WARN TRANS4MER GRILLE GUARD:**

A Warn Gen III Trans4mer grille guard with headlight protection to be installed on the front of the chassis. To be constructed of heavy-gauge two-inch (2") tube steel with a black powder coat finish.

**WARN 12,000 LB. WINCH:**

There shall be 12-Volt electric Warn 12,000 lb. winch installed on/in the bumper area. This shall be a 12,000 pound rated line-pull, three-stage planetary gear, with 125' of 3/8" galvanized aircraft cable and replaceable clevis hook with a four-way roller lead. There shall be a 12' cable and remote included.

**REAR STEP AND BUMPER:**

The rear bumper and step assembly shall extend full width of the body. The bumper structure shall be attached to the chassis frame rails using a minimum of 3" structural channel. The bumper and step assembly shall extend beyond the rear of the modular body a minimum nine inches (9") to protect the body from damage. The rear step shall be constructed of aluminum diamond plate material.

**STAINLESS RUNNING BOARDS:**

One (1) set of Luverne Truck Parts # 481523-571523 classic style stainless steel running boards shall be provided and installed on the unit beneath the cab doors on both sides of the chassis.

**TRAILER HITCH:**

A class 5 trailer hitch with adjust-a-hitch shall be installed on the rear of the rescue vehicle. The trailer hitch shall include an electrical connection.

**TRAILER LIGHT CONNECTOR:**

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

**BACK-UP CAMERA:**

Install chassis OEM provided camera system.

Note: Camera to be mounted in the center of the lower section of the Tommy Lift Gate panel at just above bumper height.

**BACK-UP ALARM:**

Federal Evacuator Plus, model 210331SSG, back-up alarm to be provided. 97 dB(A)





**COMBINATION FUEL/DEF FILL DOOR:**

A flush mounted fuel filler/DEF guard with a hinged door shall be installed over the fuel and DEF fill ports. The door shall be a Cast Products Incorporated FG2208 or similar. The door shall have a label for FUEL/DEF FILL. The labels shall be a product of Innovative Concepts Inc. Additionally, DIESEL FUEL ONLY and DEF engraved plates shall be installed inside the door on a permanently attached label above or near each fill site.

Note: There shall be a mirrored stainless splash guard surround at and below filler door. Reference previous build for design.

**TOW EYES - REAR:**

There shall be two (2) chrome tow eyes mounted directly to the chassis frame rail at the rear of the unit.

Note: Reference previous build for mounting location.

**TIRE PRESSURE MONITORING DEVICES:**

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

**MUD FLAPS - REAR:**

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

**EMERGENCY KIT:**

One (1) emergency kit shall be provided and shipped loose with the completed apparatus. Kit shall include one (1) 5lb. ABC extinguisher and three (3) triangle reflectors.

**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.

**MAXIMUM SEATING CAPACITY LABEL:**

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

**REMAIN SEATED LABEL:**

Label located in the driver's view that states "Occupants Must Remain Seated While Vehicle is in Motion".

**VEHICLE DIMENSIONS LABEL:**

A permanently engraved plate shall be installed that is clearly visible to the driver while in a seated position showing the apparatus competed overall height, length, and width.

**FASTEN SEATBELT LABEL:**

Label located in the cab that states "Occupants Must Fasten Seat Belts Before Vehicle is in Motion."



**DO NOT RIDE LABEL:**

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

**DELIVERY REQUIREMENTS:**

**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.

**VEHICLE ROAD AND SYSTEMS INTEGRITY TESTING:**

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

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

**MANUALS:**

All manuals related to sub-system components for included optional equipment to be provided at the time of customer acceptance.

Note: All vendor supplied component manuals to be provided to the customer in a binder. All Ward Apparatus manuals, regarding production and electrical manuals, to be provided to the customer on an USB drive. Shipped loose in the cab.

**WEIGHT ANALYSIS:**

Prior to leaving the manufacturing facility, the completed vehicle shall be weighed (full fuel/DEF tanks), and the weight results shall be forwarded to the purchaser for their records. To be included on a USB drive to the customer.

**FUEL:**

The completed vehicle's fuel and DEF tanks to be full at time of weight analysis and prior to departing the manufacturer's location.