CONTROL PANEL, LOAD MANAGER, HIGH IDLE, AND LOAD SEQUENCING

The electrical system shall be equipped with TST 10-TEK multi-plex switching and control system. The unit shall control six (6) 20 amp and four (4) 30 amp circuits with a capacity up to 130 amps, relay functions, ten (10) button control switch panel. Selectable switching programming shall be installed for all switches on the panel, including momentary, latching, sequencing or non-sequencing modes. Switching mode is easily selectable through DIP switch settings in the Power Distribution Center (PDC) module.

Status LEDs are provided for each circuit and the microprocessor. Circuit protection at each relay location shall also be provided. The control panel shall have distinctive conductive rubber buttons and customizable graphic legend inserts identify switch functions to the user. These easy-to-use backlit switches change color when activated.

The following features shall be provided:

- Multiplex control system
- (4) 30-amp relay controlled outputs
- (6) 20-amp relay controlled outputs
- Replaceable fuses
- Full LED diagnostics on all inputs and outputs
- Interchangeable legend inserts from front of panel for every switch
- Maximum continuous current, 130 amps
- Independent backlight brightness control
- Programmable sequencing
- Programmable load management functionality with selectable threshold
- High-idle functionality

Sequencing

Two programmable sequencing modes shall be provided with a respond mode sequencing and on-scene mode sequencing. A switch programmed for response mode shall sequence on and off automatically when switch one is turned on or off. If a normally sequenced switch is manually turned on, sequencing will not turn off that switch.

Switches programmed for on-scene mode will only turn on if automatic sequencing is enabled and the vehicle has been placed in park/neutral while already sequenced up in the response mode. This allows for an automatic change from response mode outputs to on-scene mode outputs when the vehicle is placed in park/neutral. Once in the on-scene mode, if the vehicle is taken out of park/neutral the response mode switches will sequence on, and the on-scene mode switches will sequence off.

Load management

The system shall provide for load management functionality to prevent excessive system loading from turning off critical equipment, or damaging the battery. Load management shall only function when the vehicle is in park/neutral. The load management system shall include:

a) External Alarm Output

b) Low Voltage Diagnostic LED
c) Switch Panel low voltage alarm

High Idle Function

The control system shall include a switch/relay to operate automatic high idle output. The high idle switch shall only function if the vehicle is in park/neutral, and the brake is not pressed. If the high idle output is on and the brake is pressed, or the vehicle goes out of park/neutral the system shall be disengaged. Upon the brake being removed and the vehicle going back into park/neutral, the switch will return to its previous state.

Additional System Functionality

- High/low voltage alarm function.
- Programming menu allows selection of pursuit mode switches, on-scene mode switches, and switches to be load managed, including programming for on-scene and response modes and programming load management.
- Switch Panel Backlight Brightness Adjust
- Diagnostic LEDs
- Output Protection
- Panel Power Fuse

BATTERY SWITCH - MASTER DISCONNECT

A rotary type master disconnect switch shall be provided in the cab within easy reach of the driver. The switch shall be a Cole Hersee with switch plate Off/On label.

BATTERY CHARGER

A Kussmaul Autocharge 1000 model #091-56-12, high output automatic battery charger shall be provided. The battery charger shall be wired to the 12 volt battery system. The unit shall be mounted in a clean, dry area accessible for service and/or maintenance. It shall be wired to the specified shore power receptacle.

120 VOLT SHORE POWER RECEPTACLE

A Kussmaul model 091-55-20-120 20 amp "auto-eject" shore power receptacle shall be provided with hinged weatherproof cover and an enclosure for protection from road dirt and damage The shore power plug shall be "ejected" when the chassis's engine starter is engaged and the receptacle shall be wired to any 120 volt A/C equipment requiring shore power. Location shall be:

IDENTIFICATION LIGHTS

All LED identification lights shall be installed on the vehicle as required by applicable DOT highway regulations.

LICENSE PLATE BRACKET

A CPI license plate bracket with incandescent light shall be provided at the rear of the apparatus.

TAIL, STOP, TURN, AND BACK-UP LIGHT ASSEMBLIES

Two (2) Whelen 4" x 6" LED tail-stop-turn-backup light assemblies shall be installed. The lights shall be mounted in bright bezel and installed at rear of the body

a) Red tail and stop lights
b) Amber turn signals
c) Back-up lights

TAIL AND LOWER WARNING LIGHT BEZELS

Two (2) Whelen Model #PLAST3V, 4" x 6" tail light assemblies shall be provided for three (3) lights. The assembly shall be constructed of ABS plastic with a chrome plated finish. The kit shall include mounting screws and a Santoprene rubber gasket for vertical installation. The total overall dimensions of the lamp housing shall be 15-7/16" high x 7-3/8" wide x 2-3/8" deep.

IN CAB SPOT LIGHT

One (1) Collins Model CL 12 volt hand held spot/flood light with momentary three-way switch shall be provided on the right side of the cab dash area, secured per the requirements of NFPA.

CAB GROUND LIGHTS

Four (4) LED ground lights shall be installed under the cab step area in compliance with NFPA standards activated with parking brake.

GROUND LIGHTS - UNDER REAR STEP

Two (2) LED ground lights shall be installed under the rear step area, one on each side of the apparatus, wired to parking brake circuit.

REAR STEP LIGHTS

Two (2) LED step lights with clear lens shall be installed at the rear step of the apparatus body, wired to parking brake circuit.

SCENE LIGHTS

Six (6) Whelen Model #6SC0ENZR, 4" x 6" surface mount scene lights shall be provided. The lights shall be installed in 6EFLANGE bezels. The lights shall incorporate twelve (12) clear LED's with a clear optic polycarbonate lens for maximum illumination. Location shall be two (2) each side of the body and two (2) at the rear of the body.

One (1) switch shall be installed in the cab to activate all scene lights.

COMPARTMENT LIGHTING

Seven (7) compartments equipped with ROM strip LED lights, installed one side of door opening.

The L1 and R1 compartments shall be ROM strip LED lights on both sides of the door to light both forward and rearward areas of the compartment.

COMPARTMENT LIGHT SWITCHES

The exterior compartment lights shall be automatically controlled by a door activated "On-Off" switch.

"DOOR OPEN" OR EQUIPMENT OPERATION WARNING LIGHT

A "door open" or equipment operation warning light shall be installed on cab dash. The light shall be flashing LED light with a red lens.

RADIO ANTENNA INSTALLATION

One (1) radio antenna base shall be provided installed on the apparatus at a location determined by the purchaser.

A 12 volt power and ground stud will be provided in the bottom of the electrical console to be used to provide power to buyer supplied radios.

BACKUP ALARM

One (1) Federal Signal Model #210339 Evacuator single function back-up alarm shall be provided. The back-up alarm shall have a glass reinforced nylon housing for long-lasting durability and shall produce 97 dB.

ELECTRONIC SIREN

Whelen Model #295SL100, self contained electronic siren amplifier shall be provided. The heavy duty 100/200 watt, six (6) function siren shall have the following features: hands-free operation, public address, park kill, push to talk, and radio re-broadcast.

SIREN SPEAKER

One (1) Cast Products 100 watt speaker shall be installed. Location: recessed bumper mounted

ZONE A -- UPPER LIGHTBAR

One (1) Whelen Model Liberty #SLN2QLED low profile Super-LED NFPA lightbar shall be provided. The 54" lightbar shall be designed to meet the minimum clearing requirements for Zone A Upper. The internal components of the lightbar shall be housed within a two piece extruded aluminum base/top.

The outer shell shall be clear optic polycarbonate lenses designed to maximize light output and shield against environmental elements.

The lightbar shall utilize snap-in brackets to hold in the lightheads. The brackets shall give the end user the ability to make quick repairs. The lightbar shall have all solid state components. The lightbar shall have two wire harnesses exiting the unit: one (1) 17 conductor 22 gauge control cable which controls all internal light functions; and one (1) 2 conductor 10 gauge cable for main power and ground. Each cable shall be 15' long.

The lightbar shall have two (2) red Linear Super-LED corner modules to provide off angle protection for the front of the vehicle. Each corner module shall consist of twelve (12) Super-LEDs mounted within a vacuum metalized parabolic reflector. The corner module shall also utilize an optic collimator for maximum light output. The twelve (12) LEDs shall be mounted in one straight line.

There shall be six (6) 500 Series Linear Super-LEDs: two (2) red and two (2) white front facing, and two (2) red located in the driver/passenger side end caps. Each 500 Series module shall consist of a minimum of six (6) Super-LEDs. The corner module shall utilize a vacuum metalized parabolic reflector and an optic collimator for superior light output.

The solid state I/O board shall be microprocessor controlled. The I/O board shall have built-in reverse-polarity protection and output-short protection. The board shall have the ability to flash sixteen (16) LED warning lights. There shall be a data bank of 13 Scan-Lock flash patterns including steady burn. The board shall also have outputs to add takedown and alley lights. Low power and cruise light function shall also be included. The cruise light function shall allow the user to employ the four (4) corner modules as marker courtesy lights.

ZONE A -- LOWER FRONT WARNING LIGHT

Two (2) Whelen 400 Series Model #40R02ZRR, 3" x 4" warning lights shall be installed in front grill area. The solid state warning lights shall incorporate Linear Super-LED technology. The lighthead configuration shall be designed with four (4) red Super-LED's with red optic polycarbonate lens. The lighthead shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The light shall include eleven (11) internal Scan-Lock flash patterns including steady burn, and synchronize functions.

ZONE B and D -- LOWER FRONT INTERSECTION WARNING LIGHT

Two (2) Whelen 400 Series Model #40R02ZRR, 3" x 4" warning lights shall be installed one each side at front bumper extension or on front fenders. The solid state warning lights shall incorporate Linear Super-LED technology. The lighthead configuration shall be designed with four (4) red Super-LED's with red optic polycarbonate lens. The lighthead shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The light shall include eleven (11) internal Scan-Lock flash patterns including steady burn, and synchronize functions.

ZONE B and D -- LOWER MID-BODY WARNING LIGHTS

Two (2) Whelen 400 Series Model #40R02ZRR, 3" x 4" warning lights shall be installed one each side body wheel well areas. The solid state warning lights shall incorporate Linear Super-LED technology. The lighthead configuration shall be designed with four (4) red Super-LED's with red optic polycarbonate lens. The lighthead shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The light shall include eleven (11) internal Scan-Lock flash patterns including steady burn, and synchronize functions.

ZONE B AND D -- UPPER SIDE FRONT WARNING LIGHTS

Two (2) Whelen Series 600 Model #60R02FRR, 4" x 6" warning lights shall be installed. The warning lights shall be located one (1) each side high on the body, as far forward as possible. The warning lights shall incorporate Linear-Super LED and Smart LED technology. The lighthead configuration shall be designed with eight (8) red Super-LEDs with a red optic polycarbonate lens. The lightheads shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The lighthead shall include fourteen (14) internal Scan-Lock flash patterns including steady burn and High/Low power functions.

ZONE B AND D -- UPPER SIDE REAR WARNING LIGHTS

Two (2) Whelen Series 600 Model #60R02FRR, 4" x 6" warning lights shall be installed. The warning lights shall be located one (1) each side high on the body, as far rearward as possible. The warning lights shall incorporate Linear-Super LED and Smart LED technology. The lighthead configuration shall be designed with eight (8) red Super-LEDs with a red optic polycarbonate lens. The lightheads shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The lighthead shall include fourteen (14) internal Scan-Lock flash patterns including steady burn and High/Low power functions.

ZONE C -- UPPER REAR WARNING LIGHTS

Two (2) Whelen Series 600 Model #60R02FRR, 4" x 6" warning lights shall be installed. The warning lights shall be located one (1) each side upper rear body area. The warning lights shall incorporate Linear-Super LED and Smart LED technology. The lighthead configuration shall be designed with eight (8) red Super-LEDs with a red optic polycarbonate lens. The lightheads shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The lighthead shall include fourteen (14) internal Scan-Lock flash patterns including steady burn and High/Low power functions.

ZONE C -- LOWER REAR WARNING LIGHTS

Two (2) Whelen Series 600 Model #60R02FRR, 4" x 6" warning lights shall be installed. The warning lights shall be located one (1) each side, rear lower area of body. The warning lights shall incorporate Linear-Super LED and Smart LED technology. The lighthead configuration shall be designed with eight (8) red Super-LEDs with a red optic polycarbonate lens. The lightheads shall utilize a hybrid TIR optic reflector and chrome vacuum metallized reflector for maximum illumination. The lighthead shall include fourteen (14) internal Scan-Lock flash patterns including steady burn and High/Low power functions.

GENERATOR

One (1) Harrison 5500 watt, 120/240 volt portable gasoline generator shall be provided and mounted at a location in the R3 compartment. It shall have an electric starter and backup manual recoil starter. A cylinder, four cycle, air cooled Honda engine shall have a fuel tank capacity of 5 gallons. The generator shall be mounted to the floor of the compartment.

12 VOLT START FOR GENERATOR

The specified generator electric starter shall be provided with a 12-volt power supply from the chassis batteries including a heavy duty battery type power cable and Anderson type quick disconnect receptacle at the generator and a matching male plug for connection to the generator.

INTERLOCK ON GENERATOR DOOR

An interlock switch designed to prevent starting/running of the generator while the door is closed shall be installed on the compartment door containing the generator.

GENERATOR INSTALLATION

The line voltage electrical system shall comply with the applicable NFPA #1901 and National Electric Code #70 Standards. Line voltage carrying equipment down stream of the power source shall be "listed" where available and installed in accordance with manufacturer's instructions and all electrical equipment installed shall be suitable for intended use and type locations (wet, dry, or underbody and chassis).

The grounding and bonding shall comply with NFPA #1901. The chassis frame rail, body sheet metal, and cab sheet metal shall be properly bonded per NFPA schematic with bonding copper conductor rated at 115% of current rating of power source.

Manually re-set over-current devices shall be installed protecting the line voltage electrical system components. A main over-current protection device that is either incorporated in the power source or is connected to the power source by a power supply assembly shall be provided. It shall not exceed 100 percent of the nameplate amperage rating on the power source specification label or the rating of the next larger available size over current protection device where so recommended by the power source manufacturer.

A maximum 144 inches long conductor shall be used in the power supply assembly between the output terminals of the power source and the main over current protection device. Conductors over this length, switch shall be provided with a master circuit breaker near generator in an accessible location.

Power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115 percent of the amperage of the nameplate current rating of the power source. Conductors in the power supply assembly shall be Type THHW, THW or USE stranded conductors enclosed in nonmetallic LiquidTite flexible conduit rated for a minimum of 194 degrees Fahrenheit.

Each individual circuit shall be provided with over current protection devices sized at not less than 15 amps in accordance with NEC. Over current protection devices shall each be marked to identify the function of the circuit it protects. The circuit breaker panel and instrument locations shall face the operator so that all circuit breakers are readily visible under normal operating

CIRCUIT BREAKER BOX

A circuit breaker box for line voltage equipment shall be provided capable of holding eight (8) breakers.

GFI CIRCUIT BREAKERS

GFI circuit breaker(s) shall be installed as required.

120 VOLT TWIST LOCK ELECTRIC RECEPTACLES

Two (2) 120-volt 20 amp twist lock (NEMA L5-20) receptacles shall be wired to the circuit breaker panel and shall be provided with a spring loaded weatherproof cover. Receptacles shall be located:

ELECTRIC CABLE REEL - 120VOLT

One (1) Hannay electric cable reel with electric rewind, designed for use with 120 volt, three (3) wire cable, shall be installed. The duty rating of the cable reel shall be for continuous usage and it shall be installed so that it is easily accessible for cord access and maintenance. A properly labeled push button control switch shall be located in a convenient position.

The installation of the cable reel shall meet applicable sections of the NFPA standards at time of bid. It shall be sized to hold 110 percent of the capacity needed for the specified cable length. The wire size shall be in accordance with the National Electric Code.

An information label shall be installed in a location visible adjacent to any permanently connected reel with the following data:

1) Voltage
2) Phase
3) Current type
4) Current rating
5) Total cable length

The cable reel shall be installed in a location to be determined at the pre-construction conference.

The cable reel shall be equipped with a push button rewind control, located adjacent the cable reel.

ELECTRIC CABLE - BLACK

A two hundred (200') length of 12/3 black electric cable, type SEO-WA with a 20 amp, 120 volt rating shall be installed with specified plugs.

ROLLER ASSEMBLY

A Hannay Model R-200 nylon roller unit for the electric cable shall be mounted in the specified compartment to permit the cable to feed directly off the reel.

JUNCTION BOX

One (1) Circle-D model PF51G electrical junction box with 12" pigtail and plug shall be provided with an integral pilot light to indicate electrical current. The unit shall be equipped with four (4) 120 volt 20 amp NEMA (L5-20) twist lock receptacles, each with a hinged, weatherproof cover.

JUNCTION BOX HOLDER

An aluminum storage bracket designed to hold an electric junction box shall be supplied and mounted in the same compartment as the cable reel.

TELESCOPIC FLOODLIGHTS

Four (4) Havis Shields MagnaFire #KR-SB-556DM-W4 side mount push up telescopic light shall be provided. The light pole shall be anodized aluminum and have a quick release latch to allow elevation and rotation. The light shall have one (1) quartz halogen 750-watt 120-volt bulb. Location shall be one on each front body corner and one on each rear body corner.

FRONT MOUNTED ELECTRIC WINCH

A Warn Winch Company 12,000 pound capacity, 12-volt electric winch system shall be installed on the front of the apparatus with a 4 way roller shall be installed to guide the cable. It shall have forward and reverse gears, a three stage planetary gearing and a sliding ring gear clutch that will permit free-spooling for quick unwinding of cable. The winch shall be controlled with a push button device attached to a twenty five foot (25') control cable and weatherproof receptacle. There shall be 125 feet of 3/8" diameter galvanized cable, with slip hook shall be installed.

A captive roller shall be installed to guide the winch cable at front bumper.

The winch controller shall be a push button device attached to a twenty five foot (25') cable with weatherproof receptacle. The cord shall plug into the side of the winch.

BRUSH GUARD

A Warn bumper extension kit with a chrome or stainless steel heavy duty wrap around type grill guard shall be provided on the front of the apparatus for the winch assembly. It shall be of a one piece fully welded tubular construction for maximum strength, mounted in a manner utilizing the existing holes in the vehicle frame for superior strength with the lowest vibration. The grill guard shall provide front end protection for the headlight and grille areas of vehicle.

BODY PAINTING SPECIFICATIONS – VERMILLION RED

The body shall be finish painted using a multi-step finishing system developed by the apparatus body manufacturer, in conjunction with PPG or DUPONT to insure a durable, high gloss, finish. The exterior of the body as well as any associated components that are to be painted shall be finished using the following procedure:

- The body and components are to be chemically cleaned on all surfaces.
- All surfaces are then to be sanded to proper levels and all sanding residue removed.
- Any imperfections or defects discovered shall be filled with premium body filler and sanded smooth.
- The body and components are to be primed as recommended by the paint manufacturer.
- The entire primed surface shall be thoroughly sanded and the body surfaces shall be meticulously inspected for any imperfections and properly corrected.
- The painting process shall be applied following the guidelines established by the paint manufacturer.
- The body shall be painted using a single color to match the cab primary color.

INTERIOR COMPARTMENT FINISH

The interior wall, floor and ceiling surfaces of the body compartments shall be finished with RHINO LINER type industrial coating.

WASH AND PREP OF COMPLETED VEHICLE

The apparatus cab and body shall be washed and prepared for final purchaser inspection and acceptance.

CAB LETTERING

The cab lettering shall be SignGold material, shaded in black and encapsulated in clear Mylar. A quantity of (60) three inch (3") letters shall be installed as directed by Fire Department.

Additionally, the successful bidder shall mount two (2) buyer supplied logos on the front cab doors.

BODY LETTERING

The body shall have 6" reflective Scotchlite lettering with appropriate shade and outline installed as specified by the purchaser. Quantity of letters: 46

BODY LETTERING

The body shall have 12" reflective Scotchlite lettering with appropriate shade and outline installed as specified by the purchaser. Quantity of letters: 12

CAB AND BODY STRIPING

The cab and body shall have a straight Scotchlite reflective stripe applied horizontally. The stripe shall

be a 6" minimum in width and be applied horizontally around the cab and body in accordance with NFPA standards and incorporating a "S" shaped pattern. The purchaser shall specify the color and location of the stripe.

CHEVRON STRIPING

The outer rear panels of the body shall have Scotchlite brand Diamond Grade 6" wide reflective red and amber striping installed over 50% of available area. The striping shall not be applied to the rear roll-up door. The Chevron style stripe shall be applied at a 45-degree angle, pointing towards the center upper portion of the rear panel.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

The apparatus shall be engineered to allow for up to 2,500 pounds of fire department supplied loose equipment. This shall be in compliance with NFPA standards.

ADDITIONAL EQUIPMENT

One (1) Hurst S700E eDraulic Cutter Package with shoulder strap, charger and two (2) batteries.

One (1) Hurst SP300E eDraulic Spreader Package with shoulder strap, charger and two (2) batteries.

One (1) Hurst R411E eDraulic Ram Package with shoulder strap, charger and two (2) batteries.

One (1) Extension for R411E Ram

One (1) Hurst 110 volt AC Adapter Plug for eDraulic Tools

Three (3) sets of appropriate mounting brackets for the eDraulics tools. This shall include PAC type straps and custom manufactured layout area on the rear tray to hold tools in place.

OPTIONAL ITEMS

The following items are to be individually priced and shall not be included in the base bid price. The buyer shall have the option of adding these items at the prices indicated should there be available funds at the time of the award. Items which include brackets shall be installed by the successful bidder if these items are selected.

Two (2) Streamlight "Vulcan" LED portable handlights shall be installed including mounting bracket, with 12 volt charger wired to the battery system allowing the light to recharge when not in use.

Three (3) 50' 12/3 Orange 110 volt extension cords with household type connectors

Three (3) Circle D model 164 500 watt quartz lights with mounting brackets

One (1) Set of Hurst Quick Struts in protective carrying case

One (1) FireCom intercom system consisting of base system with two (2) PTT/Intercom plug-in receptacles and two (2) FireCom headsets and hanger hooks installed for the driver and officer of the vehicle.