Bid Specifications, NWCG T1 Tender

Performance Bond
A 100% Performance bond shall be provided within 30 days after receipt of the awarded contract. The performance bond shall be furnished by the bidder of the apparatus proposed.

Inspections
Progressive inspections and payment shall be conducted along the following timeline:

- Completion of Chassis modifications
- Post-installation of Tank/Body components
- Substantial completion of major components (80%)
- Final inspection & delivery

Demonstrations During Inspection
A road performance test, pumping demonstration and foam system demonstration will be performed during the final inspection. A "mini" pump test may also be requested at the buyer's discretion

Delivery
The completed unit(s) shall be delivered at the site of manufacture.

Purpose
The completed apparatus will conform to all requirements of NWCG Type 1 Tactical Tender. In form and function, the completed apparatus is intended to provide an adequate water source to support fire suppression activities. The operation of the apparatus should be easily performed by a single operator.
While the normal operations of this apparatus will be on improved surfaces, construction of the apparatus should be completed in a manner that allows for off-road use.
Detailed information on the chassis in its military form can be found in U.S. Army publication TM 9-2320-302-10.
It is the intent of these specifications to cover the furnishing of a complete apparatus equipped as specified for use as a mobile water supply fire apparatus. The bid price shall remain valid for a period of sixty (60) calendar days from the date of bid opening. Minor details of construction and materials, where not otherwise specified, or as otherwise agreed to by the parties, are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. Completed apparatus shall comply with all Federal, State, and D.O.T. regulations, standards and laws relating to commercial vehicles as well as to emergency fire apparatus. The completed apparatus shall be able to pass a Texas State motor vehicle inspection for commercial vehicles without emergency vehicle exemptions. Any error, omission, or inconsistency that is identified by the bidder shall be listed as such in the exceptions, and a proposal to meet the intent of the specifications shall be listed.

Project Manager
The bidder shall identify the project manager for the apparatus in the proposal. This person shall be the primary point of contact throughout the entire build process.

Delivery Time
The bidder shall provide an estimated construction time for completion of the apparatus beginning on the date of contract award.

Brand Names

Where brand names or manufacturer's names are used in this document, they are intended to establish a standard of quality or materials, equipment function and/or process. There is no intent to limit competitive bidding. The decision of the City of Morgan's Point Resort as to whether an alternate is in fact "equal" shall be final.

Final Authority

The bidder acknowledges that the City shall be the final authority in evaluating the proposals. The bidder also acknowledges that if there is a dispute between the bidder and the City over what is in the best interest of the department the fire chief or designee will be the final authority.

Chassis

Apparatus shall be constructed on chassis provided by the City of Morgan's Point Resort, Texas. Prospective bidder shall provide an estimated GVWR upon bid submittal. Chassis information and retrofitting shall be performed as specified below:

Chassis Manufacturer:	Freightliner
Model:	M916A3 (FLD120) - TRUCK, TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET): 68,000 GVWR, 6 x 6, W/WINCH, (NSN 2320-01-488-6962) (EIC: B4P)
Engine:	Detroit – Diesel Series 60 DDEC IV 12.7 liter 430 HP
Transmission:	Allison automatic HD 4070SP (GEN 4) 7-speed automatic electronic pushbutton
Transfer Case:	Meritor T-2119D 1-speed
Front Axle:	Meritor, Planetary, 38 deg. Maximum Steering Angle
Rear Axle (Tandem):	Meritor RT 52-160P, 52,000 Lbs., 4.89:1 Ratio
Brakes:	Bevel Gear, Air Controlled, Air-Mechanical (60-120 PSI), ABS 4-Channel Ver. E
Wheels:	22.5 x 9.0 in, 10/M22 in
Tires	Tubeless Radial On/Off Road, Front: 425/65R22.5J XZY3, Rear: 315/80R22.5 XDY-3 Ply: Front: 18PR, Rear: 20 PR, Load Range: L
Steering:	TRW, TAS 85, Hydraulic power booster, 59 ft. 6 in. Turning Radius

Cab Equipment:

Paint:	Cab to be painted color of finished unit (White over Red), Military finish to be removed prior to painting with any repairs completed by bidder. Final finish shall appear "As New" from factory. Chassis is to be painted black.
Exhaust System:	The exhaust system shall be O.E.M stand and not be within 20" of the ground at any point. One-(1) vertical chrome plated stacks with tapered outlet, turned to the outside and 45 degrees to the rear, with heat guard shall be provided.
Chassis Steps:	The original steps into the truck shall be removed; the original painted finish shall be removed and replaced with hard chrome polished protective layer. The steps shall be so arranged so that a fireperson wearing heavy boots and turnout gear can easily gain access to all cab doors. The steps shall provide anti-slip protection and shall be constructed of a raised punch tread plate to facilitate traction and draining of accidentally spilled fluids. A clear light shall illuminate the steps with chrome guard.
Cab Assist Handles:	There shall be two (2) cab assist handles mounted, one (1) at each side of the cab directly behind the cab door opening. The original handles into the truck shall be removed; the original painted finish shall be removed and replaced with hard chrome polished protective layer. Optional stainless steel or chrome scuff plates shall be provided behind the grab rails handle to protect the paint.
Battery Access:	The truck batteries are to be located behind the driver's side step.
Front/Rear Tow Eyes:	There shall be two (2) painted or chrome tow eyes of structural steel reinforcement attached to the front and rear frame rails of the chassis. They shall be mounted at the front/rear center of the apparatus and capable to with stand the requirements of towing (not lifting) the apparatus without damage.
Cab Console:	Between the two front seats, a console shall be constructed of Polyprene® type material. The console shall be capable of holding six (6) 2" three ring binders. All of the emergency light switches shall be mounted in the console between the driver and officer seat. Additional area shall be provided for mounting of two (2) mobile radios by

the end user. The console will match the dash contour in the front and extend the full depth of the cab, terminating against the back wall. The console shall be constructed in a manner that is self-supporting. Access and chases will be provided for wires to pass through the console to the dash/engine compartments.

Wheels: The original wheels shall be removed; the original painted finish shall be removed and replaced with a color matching red paint protective layer.

Grill Guard: Bright polished grill guard similar to Raney's Herd Defender Bumper Grill Guard.

Front Axle Skid Plate: Fabrication of 3/16" aluminum, removable skid plate to protect engine in off-road applications.

Equipment Delete: Equipment shown in TM 9-2320-302-10, image 0002 00-6 and 0002 00-8
1) Marker Clearance Lights, to be replaced in Lightbar Warning
2) Beacon Warning Light, removed with mount
3) Spare Wheel and Tire, Removed with mount
4) Blackout Light, removed with mounts and connection terminated
5) Brush Guard, removed and replaced under Brush Guard
6) Military Classification Sign, removed with mounts
7) Spotting Mirrors, removed with mounts, holes filled prior to paint
8) Ramp, removed with mounts
9) Fifth Wheel, Holland, 36 in, four-way oscillating removed with mounts
10) Utility Light and mount, 2 fixed, top rear of cab, removed
11) Air Lines, removed and re-terminated under Air Supply
12) Antenna Mount, removed
13) Exhaust Muffler, reworked under Exhaust
14) Trailer Gladhands, removed and terminated, see #22
15) Pintle Hook, removed with mount
16) Backup lights, replaced under Tail/Turn/Reverse Lighting
17) Roller, Removed with mounting
18) Winch Controls, relocated into driver side compartment
19) Hydraulic Winch, relocated between rear frame rails. This includes relocating hydraulic fluid tank between frame rails or moving the tank to another location.

Freightliner Accessories: Original, Military style or painted accessories are to be replaced with OEM or like parts in bright chrome like finish. These items include: door handles, headlight bezels, mirrors, muffler shield, and radiator grill.

Cab Door Interior: The interior of the cab doors will be of a red paint finish. Military finish to be removed prior to painting with any repairs completed by bidder. Final finish shall appear "As New" from factory.

Fluid Identification Plate: A permanently engraved plate shall be retained in the cab specifying the quantity and type of fluids used in the apparatus.

Fuel Type Plate: A permanently engraved plate shall be installed on or near the fuel fill to designate the chassis fuel type.

Seating Label: There shall be a label located in the cab or in view of the driver, stating maximum seating capacity.

Vehicle Height Label: There shall be a label located in the cab or in view of the driver, stating the overall height of the vehicle.

Seat Belt Warning Label: There shall be a label located at all seating areas, warning personnel that death or serious injury could result from not wearing seat belts while the vehicle is in motion.

Poly Body Tank/Bed

The tank shall have a rated water capacity of 3,000 U.S. gallons, with integral foam tank of 30 U.S. Gallons, complete with lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the notice is to inform department personnel who store or use the tank that the unit is under warranty.

The tank shall be constructed of Polyprene® sheet stock. This material shall be non-corrosive, stress relieved thermoplastic, U.V. stabilized for maximum protection. The tank shall be of a special configuration and is so designed to be integral with the body and compartments. All exterior tank joints and seems shall feature Pro Lock type design, which includes snap-in tank components for a mechanical lock as well as extrusion welding and the Bent Edge®, and all joints shall be tested for maximum strength and integrity. The top of the tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removability.
The transverse and longitudinal swash partitions shall be manufactured of Polyprene® material. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow and meet NFPA rules. All swash partitions interlock with one another and are welded to each other as well as to the walls and floor of the tank.
The tank shall have a combination vent and fill tower. The fill tower shall be constructed of 1/2" thick Polyprene® and shall be a minimum dimension of 8"x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified by the purchaser. The tower shall have a 1/4" thick removable Polyprene® screen and a Polyprene® hinged-type cover. Inside the fill tower, there shall be a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped behind the rear wheels where specified by the purchaser so as to maximize traction.
The tank cover shall be constructed of recessed and mechanically locked 1/2" thick black Polyprene®, stress relieved, U.V. stabilized material. A minimum of two lifting dowels shall be drilled and tapped V2" x 2" to accommodate the lifting eyes.
There shall be one (1) sump standard per tank. The sump shall be constructed of 1/2" Polyprene® and be located in the left front corner of the tank, unless otherwise required and approved. The sump shall have a minimum 3" FNPT threaded outlet on the bottom for a drain plug. This shall be used as a combination cleanout and drain. All tanks shall have an anti-swirl plate located approximately 2 1/2" above the dip tube.
There will be two (2) standard tank outlets: one for tank to pump suction line at which shall be a minimum of 2 1/2” FNPT coupling; and one for a tank fill line which shall be a minimum of 1 1/2” FNPT coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1,000 G.P.M at 100 psi. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet N.F.P.A. 1900 guidelines in effect at the time of manufacture.

Internal mounting block design and hose bed floor must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur.

Hose floor loading must support up to 200 lbs. per square foot and must be evenly distributed whenever possible. Other equipment such as generators, portable pumps, etc., must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

Polyprene® body shall be designed to include integrated sidewall compartments, Port-a-tank storage sleeve, and roll up doors for compartments. Size and location of integrated compartments to be determined with end user post award.

Poly Body Sub-Frame
Unless otherwise specified, the tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area. Unless otherwise specified, the tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4” x 2” and a minimum Rockwell hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and captured front and rear as well as side to side to prevent tank from shifting during vehicle operation.

Unless otherwise specified, a picture frame type cradle mount shall be utilized with a minimum 2”x 2” x 1/4” stainless steel or aluminum angle. Where aluminum or steel tubing and channel sub frames are incorporated in the body structure, the use of corner angles having a minimum dimension of 4”x 4” x 4” by 6” high are permitted for the purpose of capturing the tank.

Although the tank is designed as a free-floating suspension unit, it is required that the tank have adequate hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on the top of the tank, halfway between the front and rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3” x 3” x W’ and shall be approximately 6 to 12 inches long. These brackets must incorporate a hard rubber isolating pad with a minimum thickness of 1/4” affixed on the underside of the angle. The angle should then be bolted to the body side wall of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank.

Hose Bed Access Steps

There shall be NFPA compliant folding steps located on the rear of the unit leading up to the hose bed. A full width step shall be located above the rear dump valve to assist personnel in loading the hose bed. Steps are to be illuminated when apparatus lights are in the “on” position.

Roll Up Compartment Doors

Integrated sidewall compartments shall be enclosed with roll-up shutter doors installed. Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum.
Shutter slats will feature a double wall extrusion 0.315” thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats will feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slats must have interlocking joints with an inverted locking flange. Slat inner seal shall be a one piece PVC extrusion; seal design will be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.
Shutter door track shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.
Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from rubber; it will be a double “V” seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece “D” shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of 0.125”. Lift bar shall be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.
Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4” in diameter and held in place by 2 heavy duty 18-gauge zinc plated plates. Counter balance system shall have 2 over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system; no foam material of any kind shall be permitted or used in this area.
Magnetic door ajar switch shall be provided and installed within the shutter door strike block. Strike block will be mounted to the door track outside of the compartment. Door switch will be controlled by a magnetic end cap installed into the shutter lift bar. Door switch will provide a ground signal to a relay or multiplexing device to control compartment lighting and/or warn operator door is open.

Adjustable Shelfs

The heights of all shelves shall be easily adjustable by using a unistrut type rail, permanently mounted to the side bay walls, along with appropriate fasteners. The unistrut is to be continuous from the top to the bottom portion of the compartment. All shelves shall be capable of supporting a minimum weight of three hundred fifty (350) pounds.

Foldable Drop Tank
The integrated Polyprene® body shall incorporate a foldable water drop tank capable of holding the entire contents of the water tank. When not in use the foldable tank will be enclosed inside the Polyprene® body, loading from the rear of the vehicle. The foldable tank frame shall be constructed of non-ferrous materials of sufficient strength to support the full contents of the water tank. Foldable tank liner shall be constructed of 32 oz. vinyl floor and 22 oz. vinyl sides.

PUMP 600 GPM (Darley HE 42K)
Pump shall be Darley, equal or better, and of a size and design, and have the capacity of 600 gallons per minute (U.S. GPM), NFPA-1901 rated performance. The pump shall be of medium pressure, high volume, gear driven, engine mounted. The entire pump shall be assembled and tested at the pump manufacturer's factory. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration. All moving parts in contact with water shall be of high quality bronze or stainless steel. The pump shall be powered by a Kubota V1505T Diesel: 42 HP turbo diesel, 4 cylinders, liquid-cooled, 12-volt starter, 40-amp alternator, oil and fuel pump filters.

Pump Certification
The pump will meet and perform the following test and certification stating, same as issued:
600 gpm (2271 L/M) @ 40 psi (2.7 bar)
300 gpm (1135 L/M) @ 135 psi (9.3 bar)
250 gpm (946 L/M) @ 150 psi (10.3 bar)

Priming Pump
The priming pump shall be a positive displacement vane type, electrically driven, and conform to standards outlined in NFPA Pamphlet No. 1901. One priming control shall both start the priming motor, and open the priming valve.

Pump Controls
Darley Remote Control Panel shall be installed in center console for comfortable operation by the operator of the apparatus. Additional controls will be located on the rear face of the apparatus.

Plumbing
Pump plumbing shall utilize a stainless-steel manifold system. Discharges and auxiliary inlets shall be plumbed using these manifold systems. Any plumbing connections shall have flexibility to prevent undue stress to the plumbing systems. Victaulic or rubber couplings shall be used where necessary to allow flexing of plumbing, which will prevent damage or loosening of piping. High-pressure hose, rated for the fire industry along with stainless steel connections shall be utilized where necessary. Pump and plumbing shall meet the standards of the latest NFPA requirements.

Valves
All intake and discharge shall be stainless quarter turn; valves shall be full flow valves. Each valve shall be operated by a control located on the pump panel. Any valve 3 or larger shall be provided with a slow close feature.

Labels
Each control and gauge will be clearly marked by a color-coded nameplate, permanently affixed to the operator’s panel. All discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of black background and natural letters.

Hose Reel
There shall be an electrically operated hose reel, located in the rear facing portion of the apparatus. The hose reel will allow easy deployment of a 1” hose line. Reel will be operated by a push button located in near proximity to the reel. Button shall be clearly labeled. Products similar to Hannay F4000 reels are acceptable.

Front Spray Nozzles
There shall be two (2) electrically controlled spray nozzles at the front-most portion of the apparatus. Each nozzle will be near the widest points of the front bumper, both road side and curbside. The type of nozzle used will allow for 180-degree coverage in a horizontal fashion. The nozzles will operate independently from each other, easily controlled by the operator or crewmember from the cab of the apparatus. This arrangement is typical of road construction water trucks, and should operate in a similar fashion. Placement of the nozzles and associated hardware should be in a manner that protects the system from damage while operating off-road.

Newton Dump Valve Electronic (Rear Mounted)
There shall be one (1) square 10" Newton series 1070-34 electric operated stainless-steel dump valve (with manual bypass) bolted directly to the integrated dump valve flanges positioned at the near-center rear. All components constantly in contact with water are to be of stainless steel, brass or rubber to assure years of dependable and trouble frees service. It shall be controlled from a location near the outlet of the valve. The switch shall be labeled as "Rear Dump Valve".
An additional switch shall be located inside the cab of the apparatus to allow operation of the valve remotely.

Newton Dump Valve Electronic (Left Side)
There shall be one (1) square 10" Newton series 1085A-34 electric operated stainless-steel dump valve bolted directly to the integrated dump valve flange positioned at the roadside rear, between axles if permissible. All components constantly in contact with water are to be of stainless steel, brass or rubber to assure years of dependable and trouble frees service. It shall be controlled from a location near the outlet of the valve. The switch shall be labeled as "Left Rear Dump Valve". An additional switch shall be located inside the cab of the apparatus to allow operation of the valve remotely. The valve chutes must be at least 36" above the ground when the tanker is fully loaded. The valves shall extend and retract when the valve is opened or closed. There shall be a spring-loaded stainless-steel door that opens and closes with the valve. The door shall be painted to match the body color or bright polished to resemble hard chrome.

Newton Dump Valve Electronic (Right Side)
There shall be one (1) square 10" Newton series 1080A-34 electric operated stainless-steel dump valve bolted directly to the integrated dump valve flange positioned at the curbside rear, between axles if permissible. All components constantly in contact with water are to be of stainless steel, brass or rubber to assure years of dependable and trouble frees service. It shall be controlled from a location near the outlet of the valve. The switch shall be labeled as "Right Rear Dump Valve". An additional switch shall be located inside the cab of the apparatus to allow operation of the valve remotely. The bottom of the dump chute shall be at least 36" above the ground when the tanker is fully loaded. The chutes shall extend and retract automatically when the valve is opened and closed. There shall be a stainless-steel spring-loaded door that will open and close with the chutes. The doors shall be painted to match the body color or bright polished to resemble hard chrome.

Water Level Indicator (Rear)
A Fire Research Tank water level system with ultra-bright L.E.Ds for better visibility shall be provided, to monitor the tank water levels. System shall utilize ultra-brite LED indicators that shall provide the operator with accurate levels of indication.

Water Level Indicator (Cab Interior)
A Fire Research Tank water level miniature gauge with ultra-brite L.E.Ds for better visibility shall be provided, to monitor the tank water levels in the cab. System shall utilize ultra-brite LED indicators that shall provide the operator with accurate levels of indication.

Water Level Indicator Large L.E.D.
There shall be two (2) large water level gauges mounted road and curb side of cab, the lights shall be similar to Whelen 500 series LED one (1) mounted on each side of the apparatus. The colors shall be as follows. Green, Blue, Yellow, Red.

12 Volt Wiring

Persons familiar with emergency vehicle systems shall perform all electrical work. All electrical components of the apparatus will use the 12-volt side of the chassis electrical system. Circuits shall serve all of the emergency electrical equipment separate and distinct from the vehicle chassis circuits. Body wiring shall be color and function coded, grease, oil and moisture resistant, routed in protected locations, neatly and securely fastened, and all apertures properly affixed with grommets for passing wiring. Solderless insulated connectors shall be provided where required. The electrical system shall be completely controlled through a distribution center. The center shall incorporate automatic reset circuit breakers connected to relays to control each electrical circuit. Each circuit breaker and relay shall be sized to the load to be carried. The 12-volt electrical system shall be controlled through a switch panel located in the cab and at a location that is easily accessible for the driver. The panel shall include switches arranged in the most convenient and practical manner that is possible. The switch panel shall operate the relays and not carry the circuit load. The panel shall individually control all emergency warning light circuits, which shall also be controlled by warning master switch. All compartment wiring shall be securely fastened or in conduit as needed to protect from hazards. All heavy ampere-carrying cables requiring terminals shall have the terminals both crimped and soldered for good electrical connections. All wiring shall be color-coded and a schematic shall be supplied upon delivery of the truck. The diagram shall represent the exact wiring application, not a proposed system. The distribution center, relays, and all other control devices shall be located in a convenient location for service. Body shall be equipped with all lighting as required by Federal Motor Vehicle Safety Standards. All electrical and emergency lighting equipment shall be supplied with automatic reset circuit breakers of appropriate amperage. All circuits shall be operated through a Bosch or equal continuous duty relay to remove load from all switches.

Battery Disconnect Switch

The factory military master battery disconnect switch shall be retained in placement and function. All additional electrical circuits added in up-fitting shall be terminated by operating the electrical disconnect. **NO** direct wiring to batteries will be accepted.

Charging System

A NOCO Gen 4, on board battery charger shall be installed for the maintenance of the existing four bank battery system. The system shall be installed in a manner that allows charging of the system by shoreline while the apparatus is not in use. Plug connection for the shoreline shale be a 20 Amp 120/1/60, female style connection.

Brake / Turn / Reverse Lights

New stop, tail, backup and Turn lights shall be installed. The type used shall be similar to Weldon brand tri-cluster lights, model 3884-0000-18 / 19 L.E.D. series respectfully.

Backup Alarm

An Ecco brand (or suitable substitute) backup alarm shall be installed and shall be activated when the transmission is placed in reverse gear.

Reverse Camera

There shall be a Reverse Camera installed in the chassis cab. It shall be mounted in clear view of the driver, and must be wired so that there is power at all times the transmission is in reverse.

Compartment Lights

The body compartments shall be equipped with low voltage LED lights. Each light shall be enclosed in a durable and impact resistant shield to protect the lights from inadvertent contact or collision, which may result in damage. The lights shall be mounted in each compartment where they will not interfere with adjustment or accessibility of any shelving or equipment. Each light shall be sized accordingly to illuminate the compartment adequately.

Compartment Open Lights

A large red light shall be mounted in the cab visible from the driver and officer's seat when contact is broken at these switches, it shall activate the compartment open light in the cab. Each compartment door shall be equipped with a door open indicator switch.

Engine Compartment Light
There shall be one (1) light installed in the engine compartment to illuminate the engine area. There shall be a switch located adjacent to or on the light.

Ground Area Lighting
There shall be high intensity water-resistant lights mounted under the unit to provide proper ground area illumination in areas designed for the personnel to climb onto or descend from the apparatus.

LED Headlights
The factory sealed beam headlights shall be retrofitted with four (4) 4×6 sealed beam 45-watt LED headlights.

Alternating Flashing Headlights
The chassis high beam headlights will alternately flash and will be controlled by a rocker switch mounted on the emergency light switch panel located in the cab.

Air System Additions
There shall be an external air inlet provided near the driver's door. These inlets shall be moved from its current location behind the cab. This inlet shall be plumbed to the chassis air system to release the chassis spring brakes for towing. There shall be a connection supplied near the front of the vehicle on the driver side of the vehicle that will allow for connection of an air hose for use of air from the vehicles air system. The air system shall be protected from depletion by the air horns or tool use by the installation of a pressure protection valve with a setting between 80-90 PSI.

Lightbar
No lightbar will be installed on the cab of the vehicle. In place of the lightbar, eight (8) Atomic LED DOT/Emergency lights will be installed on top of unit, in place of the factory DOT lights.

Warning Lighting – Modes of Operation
There shall be two modes of operation, calling for the right-of-way and blocking the right-of-way. When the master optical; 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 the right-of-way shall be energized. Right-of-Way mode of operation will incorporate white lighting to the front (headlights/take-downs), blocking the right-of-way will exclude all forward facing white lights.

NFPA Compliant Warning Lights
The following lighting zone packages have been approved by the selected manufacturers to meet the current NFPA requirements for visual warning devices as outlined in NFPA 1901 Standard for Automotive Fire Apparatus. Warning lights proposed by the vendor shall comply with this standard for each of the following zones:

LOWER ZONE A WARNING LIGHTS (GRILL)
LOWER ZONE B & D WARNING LIGHTS
LOWER ZONE C WARNING LIGHTS
UPPER ZONE B & D WARNING LIGHTS
UPPER ZONE C WARNING LIGHTS

Electronic Sirens
There shall be two (2) 100-watt driver each, electronic sirens with single switch activation, installed. Each siren will produce a separate (user selected), siren tone. Additionally, one (1) siren tone shall be changeable by use of the horn ring while in operation. Individual speakers will be supplied and mounted forward facing at the front-most area of the Chassis. The speakers shall not be obstructed with the exception of protective grills or mesh. If the speakers are to be exposed (visible), they shall have a polished finish comparable to Cast Product SA3502-92-FL6-1.

Scene Lights (12-Volt L.E.D.)
The unit shall be equipped with 30,000 LM LED scene lighting to each side and rear of the vehicle. Located two (2) on the right side, two (2) on the left side and two (2) on the rear of the apparatus. Exact location to be determined at pre-construction meeting.

Scotchlite Stripe
There shall be a 4" wide, white Scotchlite stripe installed on the apparatus. There shall be a 1/2" wide, blue Scotchlite stripe installed on the apparatus. There shall be a 3/4" wide, black Scotchlite stripe installed on the apparatus. There shall be a 3/4" wide, turned gold-leaf stripe with black backing installed on the apparatus. The stripes shall meet NFPA requirements for coverage. The exact locations and design shall be determined at the prebuild conference.

Rear Reflective Markings
A reflective red and yellow chevron pattern will be installed the vehicle rear. The pattern shall meet current NFPA requirements and shall also match the front bumper pattern. Although there is some latitude on the exact shade of yellow to be used, other colors may not be substituted.

Lettering
There shall be approximately eighty (80) 3" tall letters applied to the apparatus. The lettering shall also have a two-color shade applied. The exact color and location of the lettering and shading shall be determined at the pre-build conference.

Wiring Schematics
There shall be two- (2) complete set of detailed electrical wiring schematics shall be provided with the completed unit. The schematic shall clearly label and describe all electrical circuits for an accurate reference.

Service Manual and Parts List
Two (2) complete "operation and service" manuals shall be supplied at the time of delivery. Service manual instructions shall include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer shall supply part numbers for 28 major components (i.e. Engine, axles, transmission, pump, etc.). An electronic version of the above-mentioned manuals shall also be provided.