



Bid Specifications, NWCG T3 Engine

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
- Pre-installation of Tank/Body components
- Substantial completion of major components (80%)
- Final inspection & delivery

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 3 Wildland Engine. In form and function, the completed apparatus is intended to provide fire suppression activities in off-road environments. The operation of the apparatus should be easily performed by a single operator and crewman.

While the normal operations of this apparatus will be on semi-improved surfaces, construction of the apparatus should be completed in a manner that allows for heavy 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 an off-road fire suppression engine. 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 Brentwood 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 not be within 20" of the ground at any point. The OEM exhaust shall be modified to remove the factory stack, and replace it with tapered outlet, turned to the road and 45 degrees toward the curbside, terminating behind the cab, contained underneath the chassis of the completed apparatus. Modifications and location of exhaust shall take surrounding equipment into consideration to avoid damage in normal off-road operations.

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 replacing tank in 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

A tank and bed assembly shall be provided by the City of Morgan's Point Resort, Texas. The bidder has the option to fabricate a new Tank/Bed assembly should they feel this is the most cost effective. If the bidder chooses this option, final design and materials must be approved by the customer prior to construction. The bidder has the option to remove the existing Tank/Bed assembly from an existing chassis for modification. Modifications shall allow the placement of the supplied Tank/Bed assembly on the provided Freightliner chassis. The following modifications are not an inclusive list; formation of the final modification list will be the bidder's responsibility with customer approval:

- Removal of "catwalk" from bed.

- Removal of “whip” lines from “catwalk” area.
- Removal of rear lower equipment cabinets.
- Removal of Upper equipment cabinets.
- Removal of Upper protection bars from roadside and curbside.
- Removal of “Drop Tank” from curbside bed.
- Removal of Dump Valve from rear of tank.
- Removal of “tailboard” from rear facing bed.
- Relocation of Roll Protection after removal of “catwalk”.
- Relocation of pump assembly to curb side of rear facing bed.
- Relocation of Hannay hose reel to road side of rear facing bed.
- Relocation of two (2) “crosslays” from horizontal to vertical on roadside of rear facing bed.
- Fabrication of a dual axel wheel well.
- Fabrication of rear bed area to allow departure angle not less than 45 degrees.
- Fabrication of tool board or mounting on curbside for hand tools in area previously used for drop tank.
- Fabrication of tool board or mounting on roadside for hand tools in area previously used for upper equipment cabinets.

Hose Bed Access Steps

There shall be NFPA compliant folding steps located on the rear of the unit leading up to the top of the bed assembly. Steps are to be illuminated when apparatus lights are in the “on” position.

Roll Up Compartment Doors

Should the bidder choose to fabricate a new bed assembly in lieu of modification, new compartments will utilize roll up 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. Slat 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 Shelves

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.

Pump 500 GPM Hale Gasoline

The fire pump is provided to the bidder by the City of Morgan's Point Resort. Modifications/manufacturing of the bed assembly shall take into account inclusion of a gasoline fuel cell for fire pump operations. Quoted pump controls and remote controls must integrate with the existing fire pump.

Priming Pump

The provided priming pump is 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

A Remote Control Panel shall be installed in center console for comfortable operation by the operator or crewmember 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 provided. The reel shall be located in the rear facing portion of the apparatus on the roadside of the pump assembly. 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.

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. The purpose of these nozzles is for fire suppression, and shall be selected for this use. Placement of the nozzles and associated hardware should be in a manner that protects the system from damage while operating off-road.

Forestry Bumper Monitor

The 300gpm rated monitor is to be an all-electric single waterway monitor constructed of lightweight material. The monitor shall have cast-in turning vanes in each elbow. The monitor shall have fully enclosed motors and gears with manual overrides for both horizontal and vertical rotation and may be operated simultaneously. The

vertical travel shall be from 45° below to 90° above horizontal with adjustable stops. The horizontal rotation shall be 180° with adjustable stops at ±90°. The control system electronics shall be integrated with the monitor wiring harness. The control system shall use sealed, locking connectors for the monitor and nozzle motors. Two additional sealed, locking connectors shall be supplied for input power/electric valve control. All electrical connectors shall be minimum IP65 rated. The operator interface shall consist of a joystick which will provide up, down, right, left, fog, and stream control of the monitor. The joystick shall have a trigger switch to control an optional electric discharge valve.

Newton Dump Valve Electronic (Removal)

The existing electronic dump valve shall be removed from the provided Tank/Bed assembly. Proper measures will be taken to ensure the area is water tight and leak free. This should be completed in a manner that will insure long term performance under heavy off-road use.

Water Level Indicator (Rear)

A Fire Research Tank water level system with ultra-bright L.E.D's 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 shall 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 (if used) 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

A service manual shall be provided with the completed unit. Manual shall include equipment and component information as well as warranty and service information. This information will be delivered in both electronic and bound format.