RFB1120542083 – Vehicle Specifications for Loess Hills State Forest: Wildland Fire Engine

National Fire Protection Association (NFPA) Standards:

NFPA 1906 2016 Standard for Wildland Fire Apparatus shall be adopted and made part of these specifications. Bidder shall supply the equipment requested in compliance with the NFPA standards.

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1. **Chassis**
   - **1.1.** Chassis shall be a 550 or 5500 4 Door 4x4 with a 60” Cab to Axle Distance.
   - **1.2.** Trim package shall be basic with power doors and locks.
   - **1.3.** Engine shall be turbo charged diesel.
   - **1.4.** Transmission shall be automatic.
   - **1.5.** Tires shall be all-season or off-road radial.
   - **1.6.** Spare tire and rim shall be included and identical to apparatus tires.
   - **1.7.** Seating shall be 40/20/40 front and 60/40 rear.
   - **1.8.** Front 20 seating position shall be removed for apparatus control panel.
   - **1.9.** Step rails shall be installed below the cab with coverage for all doors.
   - **1.10.** Chassis shall be equipped with an audible backup alarm designed to sound when vehicle is placed in reverse gear.
2. **Front Bumper**
   - **2.1.** Factory bumper shall be replaced with a heavy duty steel bumper capable of housing a self-recovery winch with line pull of up to 18,000 pounds.
   - **2.2.** Bumper shall have an 18,000 pound line pull capacity, 12 volt electric winch installed complete with all wiring and fairlead.
   - **2.3.** Winch shall have a minimum of a 3-year electrical warranty including solenoid.
   - **2.4.** Winch shall have a minimum of 90’ of ½” 2160 grade steel wire rope.
   - **2.5.** Bumper shall have two, one each side, welded 7/8” D-Ring mounts rated for a minimum breaking strength of 16,500 pounds.
   - **2.6.** D-Ring mounts should be installed directly forward of the structures used to attach the bumper to the vehicle frame.
   - **2.7.** Replacement bumper shall have a grill guard and heavy duty headlamp guards welded to it.
   - **2.8.** Replacement bumper shall be protected with powder coated, black paint.
3. **Mud Flaps**

   Rear rubber mud flats shall be supplied and a bracket shall be attached to the side of the muffler pipe end to prevent damage that can occur to the mud flap.

4. Floor Mats

Floor mats shall be provided and constructed of an all-weather material and removable without tools to aid in cleaning.

5. Trailer Coupling

5.1. A Class III receiver style trailer hitch shall be provided and attached securely to the chassis frame.

5.2. A 7-Pin Automotive Style trailer wiring harness shall be attached near the trailer hitch.

5.3. A trailer brake controller shall be installed in the cab if one is not provided with the chassis from the factory.

5.4. Two safety chain tow hooks shall be installed near the receiver hitch and attached directly to the frame of the chassis.

6. Flatbed

6.1. A flatbed frame shall be constructed of aluminum with all joints welded.

6.2. Flatbed shall be approximately 110” in length and designed for a 60” Cab to Axle Length.

6.3. Flatbed side rails and cross members shall be 2” by 4” rectangular aluminum tubing.

6.4. Cross members will be designed to sit directly on the chassis frame rails.

6.5. The flatbed frame shall be covered on the top working surface with Aluminum Tread Brite.

6.6. A bulkhead shall be installed on the front of the flatbed to protect the chassis cab.

6.7. Rub rails shall be installed on the driver and passenger side of the flatbed.

6.8. Rub rails shall be a minimum 1 ½” tall and 3/8” thick and constructed of polished aluminum.

6.9. Rub rails shall be spaced a minimum of ¾” from the flatbed body with a maximum distance of 1 ½”.

6.10. Rub rails shall extend a minimum of 1” from the flatbed compartment doors.

6.11. Rub rails shall be affixed with countersunk stainless steel fasteners to facilitate easy replacement.

6.12. Rub rail spacers shall be designed to be easily replaceable.

6.13. A rear panel shall be installed on the flatbed to hold the brake lights, turn signals, reversing lights, license plate and license plate lights.

6.14. The flatbed shall be designed to be removable by being bolted to the chassis frame in accordance with the chassis manufacturer's specifications and **said specifications must be provided in writing**.

7. Flatbed Compartment Features

7.1. All compartment carcasses and doors shall be constructed of 11 gauge aluminum or thicker.

7.2. Specified compartments shall be made the largest practical dimensions to maximize storage space.

7.3. All compartments shall have at least one louvered panel bolted to a wall for adequate ventilation.

7.4. All compartments shall be provided with keyed door locks which are fully enclosed to prevent damage from interior stored equipment.

7.5. All above flatbed compartment shelves and floors shall be lined with a ¾" thick, open grid, chemical resistant, non-slip, UV stabile material that is designed to be easily removed for cleaning.

7.6. The compartment doors shall latch with polished stainless steel recessed D ring handles.

7.7. Compartment door hinges shall be stainless steel piano style and polished.

7.8. Above the flatbed compartments shall be equipped with floor drains.

7.9. Above the flatbed compartments shall be equipped with LED strip lights.

8. Driver Side Front Compartment

8.1. There shall be one (1) compartment installed on the driver side of the flatbed.

8.2. This compartment shall be approximately 50" long x 33" tall x 23" deep.

8.3. This compartment will be positioned at the front of the flatbed.

8.4. This compartment shall have two (2) doors in a lower/upper configuration.

8.5. The doors should divide the compartment in approximately a 60/40 split with lower door being approximately 20" tall.

8.6. The lower door shall open downward and designed with a minimum weight holding capacity of 50 pounds to rest tools.

8.7. There shall be one adjustable shelf installed in the lower section.

8.8. The upper section shall have a door that opens upward and include a mechanism to hold the door open.

9. Driver Side Rear Compartment

9.1. There shall be one (1) compartment installed on the driver side rear of the flatbed.

9.2. This compartment shall be approximately 22” long x 33” tall x 23” deep.

9.3. This compartment will be positioned immediately following the Front Compartment.

9.4. The doors should divide the compartment in approximately a 60/40 split with rear door being approximately 20” tall.

9.5. The lower door shall open downward and designed with a minimum weight holding capacity of 50 pounds to rest tools.

9.6. There shall be one adjustable shelf installed in the lower section.

9.7. The upper section shall have a door that opens upward and include a mechanism to hold the door open.

10. Passenger Side Front Compartment

10.1. There shall be one (1) compartment installed on the passenger side front of the flatbed.

10.2. This compartment shall be approximately 72” long x 33” tall x 23” deep.

10.3. The compartment will be positioned at the front of the flatbed.

10.4. The doors should divide the compartment in approximately a 60/40 split with rear door being approximately 20” tall.

10.5. The lower door shall open downward and designed with a minimum weight holding capacity of 50 pounds to rest tools.

10.6. There shall be one adjustable shelf installed in the lower section.

10.7. The upper section shall have a door that opens upward and include a mechanism to hold the door open.

11. Passenger Side Rear Compartment

11.1. There shall be one (1) compartment installed immediately after the 72” Passenger side front compartment.

11.2. This compartment shall be approximately 38” long x 24” tall x 23” deep.

11.3. This compartment shall be open air with no door designed to store portable fuel containers.

11.4. This compartment shall have a mechanism such as a cable or chain across the front to secure the contents and shall have one end secured to the compartment with a padlock.

12. Under Flatbed Storage Compartments

12.1. There shall be one (1) compartment installed on the driver and passenger side ahead of the rear wheel for a total of two compartments to be used for firefighter gear storage.

12.2. These compartments shall be approximately 34" long x 20" tall x 23" deep.

12.3. The doors of these compartments shall open outward toward the front of the apparatus.

12.4. These compartments shall tight construction with seals for weather resistance including rain, dirt and gravel dust.

13. Rear Above Frame Rail Compartment

13.1. There shall be a storage compartment above the frame rail of the chassis.

13.2. The door for this compartment shall be a smooth aluminum with push button latch that will be chevron finish, same as the rear of the unit.

13.3. Approximate dimensions of the compartment shall be 112" (full length of bed) L x 5.75"H x 29"W.

14. Wiring System

14.1. Wiring system and all components shall be 12 volt direct current.

14.2. Wiring shall Cross-Linked SXL automotive wire.

14.3. Wiring shall be rated to carry 125% of the maximum current for which the circuit is protected.

14.4. Wiring shall be sized to provide a maximum of 10% voltage drop to any electrical device.

14.5. Wiring shall be color, number and function coded.

14.6. Wiring number and function shall be printed every three (3) inches across the length.

14.7. Wiring shall be routed through heavy-duty PVC split loom to protect it from heat, oil and abrasion.

14.8. Wiring that passes through body panels shall be protected with an electrical grommet.

14.9. All wire connections shall be made using mechanical connectors and secured to terminals and junction boxes using machine screws.

14.10. All circuits shall be protected with properly rated Low Voltage Overcurrent Protective devices that automatically reset.

14.11. Apparatus shall be supplied with a master battery disconnect switch installed between the starter solenoid(s) and the remainder of the apparatus electrical loads.

14.12. Master disconnect shall be installed on the floor pan adjacent to the driver seat and be designed to be operated by the driver's left hand while the apparatus door is closed.

14.13. Apparatus shall be supplied with one 12 volt automatic battery charger with a minimum 18 amp rating and designed for two batteries.

14.14. Automatic battery charger shall be located in a location safe from passenger damaged on the driver side of the apparatus.

14.15. Automatic battery charger shall have a 120 volt outlet with water proof cover on the exterior driver side of the apparatus that is protect by a circuit breaker and ground fault circuit interrupter (GFCI).

15. Lighting

15.1. A light shall be installed on the rear of the apparatus above the license plate bracket and be designed to function in unison with the head lights.

15.2. Clearance lights and reflects shall be installed on the apparatus that comply with Iowa Department of Transportation and Federal Motor Vehicle Safety Standards.

15.3. All clearance lights and reflectors shall be installed within "C" channel protective guards.

15.4. Step lights shall be installed to illuminate the ground below all four apparatus passenger compartment doors and steps.

15.5. All step lights shall provide a minimum of 1 foot-candle of light on the ground in a 180 degree arc at a distance of 30" from all ingress/egress points and steps.

15.6. Step lights shall resistant to shock and constructed of heavy duty polycarbonate housing and lenses.

15.7. Step lights shall be sealed to prevent moisture and dust from entering.

15.8. Additional step lights shall be installed at the rear of the apparatus to illuminate the rear steps.

15.9. All step lights shall function when the apparatus park brake is applied.

15.10. Two lights shall be installed on opposite sides of the rear pump panel area (one each side).

15.11. These pump panel lights shall be operated by a switch located on the pump panel.

15.12. Pump panel area lights shall be designed and installed in a manner that will not shine light directly in the eyes of the pump operator.

15.13. Flatbed tailboard lights shall include two (2) (one each side) red stop/turn/tail lights and two (2) (one each side) clear reverse lights.

16. Apparatus Master Electrical System Control Panel

16.1. Master control panel shall be the location of apparatus electrical system controls.

16.2. Master control panel shall be located in the area left void from the removal of the 20 front split seat.

16.3. Master control panel shall be constructed of HDPE plastic with thermoplastic welds.

16.4. Master control shall have installed a total of three (3) battery hot auxiliary power leads that terminate within.

16.5. Master control panel shall have all switches clearly labeled as to their function.

16.6. Master control panel shall have a space designed for a mobile radio to be installed.

17. Audible Emergency Warning Devices:

17.1. A siren control shall be installed in the passenger compartment.

17.2. Siren control shall be capable of producing a minimum of 100 watt power output.

17.3. Siren control shall be equipped with a microphone with cord.

17.4. Siren control shall include radio rebroadcast.

17.5. Siren control shall be one unit consisting of the controller and amplifier.

17.6. Siren control shall have a separate bank with a minimum of 4 illuminated switches designed to activate common siren tones.

17.7. An exterior siren speaker shall be mounted facing forward near the apparatus grill.

17.8. Exterior siren speaker shall be rated for the same amperage as the siren control with at least a minimum of 100 amps.

18. Optical Warning Devices:

18.1. On top of the flatbed bulkhead shall be installed a 49” dual function LED light bar.

18.2. The driver side of the 49” light bar shall have red lights on the driver side, blue lights on the passenger side and clear lights in the center.

18.3. The rear of the 49” light bar shall be amber LED lights with directional capabilities for traffic control.

18.4. There shall be a surface mount, dual function Red/White LED light bar installed on the left side of the grill.

18.5. There shall be a surface mount, dual function blue/White LED light bar installed on the right side of the grill.

18.6. There shall be a surface mount, dual function Red/White LED light bar installed on the left front side of the apparatus.

18.7. There shall be a surface mount, dual function blue/White LED light bar installed on the right front side of the apparatus.

18.8. There shall be a surface mount, dual function Red/White LED light bar installed on the left rear side of the apparatus.

18.9. There shall be a surface mount, dual function blue/White LED light bar installed on the right rear side of the apparatus.

18.10. There shall be two (2) (one each side) amber LED light bars mounted on the tailboard of the apparatus flatbed.

18.11. There shall be an optical warning device controller located in the apparatus master electrical system control panel.

18.12. The optical warning device controller shall have only one master control switch that operates all optical warning devices.

18.13. The optical warning device controller shall not be subject to load management.

18.14. The optical warning device controller shall have a 2 year warranty.

18.15. The optical warning device controller shall have a programmable slide switch with a minimum of three positions.

18.16. The optical warning device controller shall have green back lit buttons that turn red upon activation.

19. Skid Unit Water Tank

19.1. The water tank shall be constructed of black 1/2" thick extruded polypropylene plastic that is textured.

19.2. The water tank material shall be of a certified, virgin, high quality, noncorrosive, stress relieved thermoplastic.

19.3. All water tank joints and seams are to be fusion welded and electronically and hydrostatically tested for maximum strength.

19.4. Water tank interior shall include 3/8" thick interlocking transverse and longitudinal partitions commonly known as baffles.

19.5. Interior water tank components shall also be constructed of extruded polypropylene plastic with no requirements on color.

19.6. All interior water tank components shall be welded to each other or the exterior of the tank.

19.7. The rear of the water tank shall have a clear sight gauge which is incorporated into the tank exterior.

19.8. Water tank shall be designed to prevent debris from entering the tank while refilling.

19.9. The water tank shall have an 8" tall by 8" wide fill tower located at the rear of the tank.

19.10. The water tank fill tower cap shall be molded to fit securely to the tower and blue in color.

19.11. The water tank fill tower cap shall be secured to the tank with a corrosion resistant tether to prevent loss.

19.12. The water tank shall have one sump recessed into the tank floor that is a minimum of ¼" deep.

19.13. The rear of the water tank shall have one (1) 3" FNPT suction fitting.

19.14. The rear of the water tank shall have one (1) 1 ½" FNPT tank fill fitting with flow deflector.

19.15. Water tank shall be securable to the flatbed with a minimum of four fastener locations.

19.16. Water tank shall have a 1" FNPT female tank drain located on the rear tank wall.

19.17. Water tank drain plug shall be 1" FNPT male and constructed of stainless steel.

19.18. Water tank shall have two (2) hose reel mounting blocks welded to the top of the tank.

19.19. Hose reel mounting blocks shall be slotted to accommodate (2) 3/8”-16 sliding fasteners.

19.20. Water tank shall have an intelligent water level control system with LED light panel located at the Pump Operators Control Panel.

19.21. Water tank shall have a 12 gallon foam cell.

19.22. Foam cell shall be designed to prevent aeration of foam while filling.

19.23. Foam cell shall be designed to prevent debris from entering system while filling.

19.24. Foam cell shall be installed internal to the tank using mechanical fasteners.

19.25. The foam cell shall have an 8” tall by 8” wide fill tower.

19.26. The foam cell fill tower cap shall be molded to fit securely to the tower and black in color.

19.27. The foam cell fill tower cap shall be secured to the tank with a corrosion resistant tether to prevent loss.

19.28. The foam cell shall be connected to and controlled by a “through the pump” foam educator and mixer.

19.29. The foam educator controller shall be located on the Pump Operators Panel.

19.30. The water tank shall have a lifetime warranty.

20. Skid Unit Water Pump and Water Pump Engine

20.1. Water pump engine shall be naturally aspirated using diesel fuel.

20.2. Water pump engine shall be a minimum of 24 horsepower.

20.3. Water pump engine shall have a minimum of three (3) cylinders.

20.4. Water pump engine shall use fuel injection.

20.5. Water pump engine starting system shall be equipped with glow plug.

20.6. Water pump engine shall be plumbed to the apparatus fuel tank with its own fuel line, filter and fuel pump.

20.7. Water pump engine shall come with a master kill switch.

20.8. Water pump engine components shall be 12 volt.

20.9. Water pump engine shall be equipped with electric start.

20.10. Water pump engine shall be liquid cooled.

20.11. Water pump engine muffler shall be mounter vertically and include a heavy-duty rain cap and spark arrestor.

20.12. Water pump shall be a detachable 4 stage centrifugal design

20.13. Water pump shall be removable in the field and interchangeable with standard wildland Mark-3 pumps.

20.14. Water pump intake shall be 2" Male NPSH.

20.15. Water pump discharge shall be 1 ½" Male NPSH.

20.16. Water pump and water pump engine shall come mated and secured to a frame that has four (4) leg mounts.

20.17. Water pump and water pump engine shall have a minimum flow rate of 100 Gallons Per Minute (GPM) at 150 Pounds per Square Inch (PSI) of pressure.

20.18. Water pump and water pump engine shall have a minimum flow rate of 100 Gallons Per Minute (GPM) at 250 Pounds per Square Inch (PSI) of pressure.

20.19. Water pump and water pump engine shall have a minimum flow rate of 60 Gallons Per Minute (GPM) at 350 Pounds per Square Inch (PSI) of pressure.

20.20. Water pump and water pump engine shall have a 12 volt electric priming system.

20.21. Water pump and water pump engine shall have a minimum two (2) year warranty.

20.22. Two (2) foot valves with strainers designed specifically for the specified pump configuration shall be supplied with the apparatus.

20.23. Water pump and water pump engine shall be controlled with a Panel Mount Standard Control Panel (PMSCP) designed for diesel engines.

20.24. PMSCP-Diesel shall include: master LED stainless steel toggle button, low pressure protection/override, stainless steel engine start push button, water pump primer button, water pressure gauge from 0-600 PSI, oil warning light, temperature warning light, glow plug timer, and Vernier throttle with red emergency throttle idle push button.

21. Winterizing

The entire water delivery system shall be designed to be blown out with compressed air for the purpose of winterizing the unit.

22. Pump Operators Control Panel

22.1. All electrical components related to pumping water shall be located together

at the rear of the apparatus in a Pump Operators Control Panel.

22.2. The pump operators control panel shall contain the PMSCP-Diesel, foam educator controller, pump panel light switch, intelligent water level gauge, booster hose rewind switch,

22.3. The Pump Operators Control Panel shall be constructed of stainless steel.

22.4. The Pump Operators Control Panel shall have an overhang on the top to house a pump panel light and help protect the panel from water.

22.5. The rear of the Pump Operators Control Panel shall be covered to make the entire panel weather resistant.

22.6. The Pump Operators Control Panel shall be protected by a circuit breaker.

23. Plumbing

23.1. All plumbing shall be stainless steel or high pressure flexible pipe.

23.2. All valves shall be ¼ turn full-flow ball valves made of forged brass with a stainless steel ball.

23.3. All valves shall be easily reached by the Pump Operator and located as near the Pump Operators Control Panel as feasible.

23.4. There shall be a 2 ½" tank to pump valve installed with a flexible connection between the tank and the valve.

23.5. There shall be a 2 ½" hydrant/draft connection on the intake side of the pump that terminates near in a 2 ½" MNST fitting with cap and chain located at the rear of the apparatus.

23.6. A welded stainless steel manifold shall be installed to house a total of three (3) discharge valves.

23.7. Two (2) 1" discharge valves shall terminate in a MNST fitting with a cap and chain.

23.8. One (1) 1 ½" discharge valve shall terminate in a MNST fitting with a cap and chain.

23.9. One 1" discharge shall be plumbed to a booster hose reel.

23.10. There shall be a 1" pump to tank valve located on the pump manifold to allow for tank refill and recirculation.

24. Booster Hose Reel

24.1. One aluminum booster hose reel shall be installed on top of the water tank.

24.2. Booster hose reel shall be installed with water intake and rewind facing the

rear of the apparatus so booster hose may be pulled from either side.

24.3. Booster hose reel shall contain 100’ of 1” red neoprene hose with a service test pressure of 400 PSI.

24.4. Booster hose shall terminate in a Forestry Twin Tip Nozzle.

24.5. Booster hose reel shall include a 12 volt rewind motor with a rewind switch located on the Pump Operators Panel.

24.6. Booster hose reel shall have two (2) (one each side) chrome hose roller guides

25. Additional Warranties

25.1. The entire apparatus shall be warranted free of defects in craftsmanship and workmanship for a period of one (1) year from the date of delivery.

25.2. All electrical components supplied by the builder shall be warranted for a period of two (2) years.

25.3. The truck chassis shall be covered by the standard manufacturer’s warranty.