Taos Pueblo DPS
Taos, NM
Wildland Flatbed SVI# 1284
Production Specification

ROCK SOLID QUALITY

LIABILITY INSURANCE

The manufacturer shall furnish with the bid a certificate of insurance for;

Workman's Compensation and Employer's Liability Insurance covering for all employees.

General Liability (each occurrence) of $1,000,000.00. General Aggregate coverage of $2,000,000.00. Products Completed / Operations Aggregate coverage of $2,000,000.00. Medical Expense coverage of $5,000 (any one person). Personal Injury of $1,000,000.00.

Automobile liability of $1,000,000.00 combined single limit (each accident), including any auto, all owned autos, scheduled autos, hired autos, non-owned autos, and garage liability.

Excess Umbrella Liability coverage of $6,000,000.00 each occurrence, Aggregate of $6,000,000.00.
Garage Keepers Liability coverage of $6,000,000.00 combined limit.

All insurance policies must be;

- Maintained for the life of the contract,
- Must provide ten (10) days notice before cancellation,
- Must cover all operations of the contractor, or anyone employed by them.

INTERNET IN-PROCESS SITE

The manufacturer shall post and maintain a website where the Taos Pueblo will be able to view digital images of their apparatus as its being built. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of unit.

RESPONSIBILITY OF PURCHASER

It shall be the responsibility of the purchaser to specify the details of the apparatus in addition to the requirements in NFPA 1906 needed by the manufacturer to build the apparatus, including:

1) Requirements not uniquely specified in NFPA 1906, such as the type of apparatus desired.
2) Any features of the apparatus desired in addition to, or in excess of, the requirements in NFPA 1906.

After acceptance of the fire apparatus, the purchaser shall be responsible for ongoing training of personnel to develop and maintain proficiency regarding the proper and safe use of the apparatus and the associated equipment.

RESPONSIBILITY OF CONTRACTOR

The Contractor shall provide a detailed description of the apparatus, a list of equipment to be furnished, and other construction and performance details to which the apparatus shall conform. The detailed description of the apparatus shall include, but shall not be limited to,

1. Estimated In-Service Weight,
2. Wheelbase, Turning Clearance Radius,
3. Principal dimensions, Angle of Approach, Angle of Departure,
4. Transmission, Axle Ratios.

The Contractor’s detailed description shall include a statement specifically describing each aspect of the delivered apparatus that will not be fully compliant with the requirements of this standard.

The purpose of these Contractor specifications shall be to define what the contractor intends to furnish and deliver to the purchaser.

Responsibility for the apparatus and equipment shall remain with the contractor until they are accepted by the purchaser.

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

The cab/chassis shall be equipped with a stability control system. The system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer and individual wheel brake controls.

FIRE APPARATUS PERFORMANCE

The fire apparatus shall meet the requirements of this standard at elevations of 2000 ft (600 m) above sea level.

The fire apparatus shall meet all the requirements of this standard while stationary on a grade of 10 percent in any direction.

The fire apparatus shall meet the requirements of this standard in ambient temperature conditions between 32°F (0°C) and 110°F (43°C).

HIGHWAY PERFORMANCE

The apparatus, when loaded to its estimated in-service weight, shall be capable of the following performance while on dry, paved roads that are in good condition:

1) From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 km/hr) within 25 seconds on a level road.
2) The apparatus shall be able to attain a minimum top speed of 50 mph (80 km/hr) on a level road.
3) The apparatus shall be able to maintain a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent.

The maximum top speed of fire apparatus with a GVWR over 33,000 lb (11,800 kg) shall not exceed 68 mph (105 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (85 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

The vehicle shall be capable of maneuvering across a 20 percent grade and up and down a 25 percent grade.

SERVICEABILITY

The fire apparatus shall be designed to allow the manufacturer’s recommended routine maintenance checks of lubricant and fluid levels to be performed by the operator without lifting the cab of a tilt-cab apparatus or without the need for hand tools.

Where special tools are required for routine service on any component of the apparatus, such tools shall be provided with the apparatus.

Apparatus components that interfere with repair or removal of other major components shall be attached with fasteners, such as cap screws and nuts, so that the components can be removed and installed with ordinary hand tools. These components shall not be welded or otherwise permanently secured into place.

WILDLAND DOCUMENTATION

The contractor shall supply, at the time of delivery, at least one (1) copy of the following documents:

1. The manufacturer's record of apparatus construction details, including the following information:
   (a) Owner's name and address
   (b) Apparatus manufacturer, model, and serial number
   (c) Chassis make, model, and serial number
   (d) GAWR of front and rear axles and GVWR
   (e) Front tire size and total rated capacity in pounds (kilograms)
   (f) Rear tire size and total rated capacity in pounds (kilograms)
   (g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
   (h) For each engine: make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
   (i) Type of fuel and fuel tank capacity
   (j) Electrical system voltage and alternator output in amps
   (k) Battery make, model, and capacity in cold cranking amps (CCA)
   (l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
   (m) Ratios of all driving axles
   (n) Maximum governed road speed
   (o) For each pump: make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
   (p) For each pump transmission: make, model, serial number, and gear ratio
   (q) Reserved
   (r) Water tank certified capacity in gallons or liters
   (s) Reserved
   (t) Paint manufacturer and paint number(s)
   (u) Company name and signature of responsible company representative
   (v) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with water tank full but without personnel, equipment, and hose)

2. Certification of compliance of the optical warning system
3. Siren manufacturer's certification of siren
4. Written load analysis and results of the electrical system performance tests
5. Certification of slip resistance of all stepping, standing, and walking surfaces
6. The wildland fire pump manufacturer's certification of suction capability
7. If special conditions are specified by the purchaser of the wildland fire pump, the pump manufacturer's certification of suction capacity under the special conditions
8. A copy of the apparatus manufacturer's approval for stationary pumping applications of the wildland fire pump
9. For each pump, the pump manufacturer's certification of the hydrostatic test
10. For each pump, the certification of inspection and test for the pump
11. The certification of water tank capacity
12. If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification that the foam proportioning system meets this standard
13. If the system has a CAFS, the documentation of the manufacturer's pre delivery tests

14. If the apparatus has a line voltage power source, the certification of the test for the power source *(see NFPA 1901, Standard for Automotive Fire Apparatus, 22.15.7.2)*
15. If the apparatus is equipped with an air system, air tank certificates *(see NFPA1901, 24.5.1.2)*, the SCBAfill station certification *(see NFPA 1901, 24.9.7)*, and the results of the testing of the air system installation *(see NFPA 1901, 24.14.5 and NFPA 1901, 24.15.4)*
16. Certification of vehicle side slope stability, including the weight distribution assumed for the calculations or as loaded on the vehicle for the tilt table test
17. Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

The contractor shall deliver with the fire apparatus complete operation and service documentation covering the completed apparatus as delivered and accepted.

The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

The contractor shall also deliver with the fire apparatus the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

1) Manufacturer's name and address
2) Country of manufacture
3) Source for service and technical information
4) Parts replacement information
5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
6) Wiring diagrams for low voltage and line voltage systems to include the following information:
   a) Pictorial representations of circuit logic for all electrical components and wiring
   b) Circuit identification
   c) Connector pin identification
   d) Zone location of electrical components
   e) Safety interlocks
   f) Alternator–battery power distribution circuits
   g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
7) Lubrication charts
8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
9) Precautions related to multiple configurations of aerial devices, if applicable
10) Instructions regarding the frequency and procedure for recommended maintenance
11) Overall apparatus operating instructions
12) Safety considerations
13) Limitations of use
14) Inspection procedures
15) Recommended service procedures
16) Troubleshooting guide
17) Apparatus body, chassis and other component manufacturer's warranties
18) Special data required by this standard
19) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

The contractor shall deliver with the apparatus all manufacturer's operations and service documents supplied with components and equipment that are installed or supplied by the contractor.

NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE

The vehicle construction details and the operations and service documentation as required per NFPA 1901 latest edition shall be provided on a USB Flash Drive. These manuals shall be divided into sections for ease of reference. There shall be two (2) USB flash drives provided with the completed vehicle.

FIRE APPARATUS SAFETY GUIDE

A Fire Apparatus Safety Guide published by Fire Apparatus manufacturer's Association shall be provided with delivered vehicle. This manual includes essential safety information for fire fighters, fire chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport fire fighting apparatus manufactured on either custom or commercial chassis.

STATEMENTOF EXCEPTIONS

The final-stage manufacturer shall deliver with the fire apparatus either a certification that the apparatus fully complies with all requirements of this standard or alternatively, a Statement of Exceptions specifically describing each aspect of the completed apparatus that is not fully compliant with the requirements of this standard at the time of delivery.

The Statement of Exceptions shall contain, for each noncompliant aspect of the apparatus or missing required item, the following information:

1) A separate specification of the section of the applicable standard for which compliance is lacking
2) A description of the particular aspect of the apparatus that is not in compliance therewith or required equipment that is missing
3) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
4) Identification of the entity that will be responsible for making the necessary post delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance with this standard

Prior to or at the time of delivery of the apparatus, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for final assembly of the apparatus and by an authorized agent of the purchasing entity, indicating mutual understanding and agreement between the parties regarding the substance thereof.

CARRYING CAPACITY

The GAWR and the GCWR or GVWR of the chassis shall be adequate to carry the weight of the completed vehicle when loaded to its estimated in-service weight. The manufacturer shall establish the estimated in service weight during the design of the vehicle.

The estimated in-service weight shall include the following:

1. The chassis, body and tank(s)
2. Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
3. Full water and other agent tanks
4. *250 lb (114 kg) in each seating position
5. Fixed equipment such as pumps, aerial devices, generators, reels and air systems as installed
6. Ground ladders, suction hose, designed hose load in their hose beds and on their reels
7. An allowance for miscellaneous equipment that is at least as great as the values shown in table below.
8. If the apparatus is designed to accommodate SCBA, an additional 25 lb. (11.4 kg) per seating position shall be added to the miscellaneous equipment allowance.

The manufacturer shall engineer and design the fire apparatus such that the completed apparatus, when loaded to its estimated in-service weight, with all movable weights distributed as close as is practical to their intended in-service configuration, does not exceed the GVWR.

A final manufacturer's certification of the GVWR or GCWR, along with a certification of each GAWR, shall be supplied on a label affixed to the vehicle.

The fire apparatus manufacturer shall permanently affix a high-visibility label in a location visible to the driver while seated.

The label shall show the height of the completed unequipped fire apparatus in feet and inches (meters), the length of the completed fire apparatus in feet and inches (meters), and the GVWR in tons (metric tons).

Wording on the label shall indicate that the information shown was current when the apparatus was manufactured and that, if the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate.

GVWR	Chassis		Storage Area		Equipment Weight		Ground Clearance	
Apparatus Type	**lb.**	**kg.**	**ft.3**	**m3**	**lb.**	**kg.**	**in.**	**mm.**
Wildland Fire Apparatus	15,000	7,000	20	0.56	200	90	12	300
	15,001 - 20,000	7,001 - 9,000	50	1.42	500	225	13	330
	20,001 - 26,000	9,001 - 12,000	50	1.42	500	225	15	380
	>26,000	>12,000	75	2.12	750	340		
Wildland Mobile Water Supply Fire Apparatus	All	All			200	90		

TESTING

ROAD TEST

Each apparatus shall be tested by the manufacturer before delivery to verify that it meets the following criteria;

Tests shall be conducted at a location and in a manner that does not violate local, state or provincial, or federal traffic laws. Tests shall be conducted on a dry, level, paved surface that is free of loose material, oil, or grease. Tests shall be conducted with the water and foam tanks full (water or product).

The apparatus shall accelerate from 0 to 35 mph (55 km/hr) within 25 seconds. The apparatus shall attain a speed of 50 mph (80 km/ hr).

The auxiliary braking system, if so equipped, shall function as intended by the auxiliary braking system manufacturer.

The air service brakes shall bring the apparatus to a complete stop from a speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m).

The hydraulic service brakes shall bring the apparatus to a complete stop from a speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m).

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (–18°C and 43°C).

TEST SEQUENCE

The following three (3) tests shall be performed in the order in which they appear below. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for ten (10) minutes. Failure of any of these tests shall require a repeat of the sequence.

1. RESERVE CAPACITY TEST

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

2. ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer’s governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the warning system required in 13.3.4, or a system voltage of less than 11.8 V dc for a 12 V nominal system, 23.6 V dc for a 24 V nominal system, or 35.4 V dc for a 42 V nominal system for more than 120 seconds shall be considered a test failure.

3. LOW VOLTAGE ALARM TEST

The following test shall be started with the engine off and the battery voltage at or above 12 V for a 12 V nominal system, 24 V for a 24 V nominal system or 36 V for a 42 V nominal system.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm does not sound in less than 140 seconds after the voltage drops to 11.70 V for a 12 V nominal system, 23.4 V dc for a 24 V nominal system, or 35.1 V for a 42 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

1) Documentation of the electrical system performance tests
2) A written electrical load analysis, including the following:
   a) The nameplate rating of the alternator
   b) The alternator rating
   c) Each of the component loads specified that make up the minimum continuous electrical load
   d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load
   e) Each individual intermittent electrical load

MANUFACTURER PUMP CERTIFICATION

The apparatus upon completion shall be tested and certified by the manufacturer. The certification tests shall follow the guide lines outlined in NFPA 1901 "Standard for Fire Apparatus".

If the fire pump has a rated capacity of less than 750 gpm (3000 L/min), the pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus.

A fifty (50) minute pumping test from draft shall be completed and results recorded to perform as listed below;

- 100% of rated capacity at 150 psi (1,000 kPa) net pressure, 30 min.
- 70% of rated capacity at 200 psi (1,400 kPa) net pressure, 10 min.
- 50% of rated capacity at 250 psi (1,700 kPa) net pressure, 10 min.

The test shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi (3,400 kPa).

The pump shall comply with the applicable requirements of "Standard for Fire Apparatus 1901, latest edition.

The pump shall be capable of producing fire streams that are free from objectionable pulsation under all normal operating conditions.

If the apparatus is equipped with a pump driven by the chassis engine designed for both stationary pumping and pump-and-roll, the test shall verify that the engine speed control at the pump operator's panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the parking brake is off, and the pump shift status in the driving compartment is disengaged.
(2) The chassis transmission is in any gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the "Pump Engaged" or the "OK to Pump-and-Roll" position.

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

WARRANTY

A full statement shall be provided of the warranties for the vehicle(s) being bid. Warranties should clearly describe the terms under which the vehicle manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material and for the applicable period of time after delivery.

Cost of repairs refers to all costs related thereto including, but not limited to, the cost of materials and the cost of labor.

The Body Manufacturer shall warrant all materials and accessories used on the vehicle(s), whether fabricated by manufacturer or purchased from an outside source and will deal directly with the Taos Pueblo on all warranty work.

GENERAL LIMITED WARRANTY - TWO (2) YEARS

The vehicle shall be free of defects in material and workmanship for a period of two (2) years or 36,000 miles (or 57,936 kilometers), whichever occurs first starting thirty (30) days after the original invoice date.

The Contractor must be the "single source" coordinator of all warranties on the vehicle.

LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

The vehicle low voltage electrical system shall be free of defects in material and workmanship for a period of five (5) years or 60,000 miles (or 96,561 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

STRUCTURAL WARRANTY - TEN (10) YEARS

The body shall be free of structural or design failure or workmanship for a period of ten (10) years, or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

UNDERCOAT WARRANTY

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

PAINT LIMITED WARRANTY - TEN (10) YEARS

The body shall be free of bubbling or peeling as a result of a defect in the method of manufacture for a period of ten (10) years or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date. **Pro-rated warranties will not be acceptable.**

GRAPHICS LIMITED WARRANTY

The 3M graphics installation shall be warranted for a period of two (2) years. The 3M materials installed on completed vehicle shall be warranted for seven (7) years. The 3M Diamond grade film (if specified) shall be warranted for ten (10) years.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within six hundred twenty (620) days after pre-construction meeting and receipt and approval of any signed change orders from Taos Pueblo.

Contractor shall not be held liable for delays of chassis delivery due to accidents, strikes, floods or other events not subject to their control. Contractor shall provide written notice to Taos Pueblo as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

DEALER MAKE READY PERIOD

The completed vehicle shall be delivered after one (1) days for dealer preparation after completed apparatus delivered to dealer location.

OVERALL HEIGHT REQUIREMENT

There is no overall height (OAH) restriction for this vehicle.

OVERALL LENGTH REQUIREMENT

There is no overall length (OAL) restriction for this vehicle.

ANGLE OF APPROACH

The angle of approach for this vehicle shall not be less than twenty (20) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1906.

ANGLE OF DEPARTURE

The angle of departure for this vehicle shall not be less than twenty (20) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1906.

Inspection Trips, Delivery, Demonstration

PRE-CONSTRUCTION CONFERENCE

A pre-construction conference shall be required at the Contractor's factory for two (2) personnel from the Taos Pueblo to finalize all construction details prior to manufacturing.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-construction conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

FINAL INSPECTION CONFERENCE

A final inspection conference shall be required at the Contractor's factory for two (2) personnel from the Taos Pueblo to inspect the vehicle and construction details prior to shipment of the completed vehicle. This inspection shall take place after any specified striping and lettering is installed.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the final inspection conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

DELIVERY AND DEMONSTRATION

The Contractor shall be responsible for the delivery of the completed unit to the Taos Pueblo's location. On initial delivery of the apparatus, the Contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the Taos Pueblo regarding the operation, care and maintenance of the apparatus and equipment supplied at Taos Pueblo location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Taos Pueblo.

After delivery of the apparatus, the Taos Pueblo shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment.

CAB CHASSIS SPECIFICATIONS

Base Vehicle

W5H Base Vehicle Price (W5H)

Packages

660A Order Code 660A
Includes:
- Transmission: TorqShift 10-Speed Automatic 10R140 with neutral idle. Includes SelectShift and selectable drive modes: normal, tow/haul, eco, slippery roads and off-road.
- Wheels: 19.5" x 6" Argent Painted Steel Hub covers/center ornaments not included.
- Radio: AM/FM Stereo w/MP3 Player Includes 6 speakers.
- SYNC 4 Includes 8" LCD capacitive touchscreen with swipe capability, wireless phone connection, cloud connected, AppLink with app catalog, 911 Assist, Apple CarPlay and Android Auto compatibility and digital owner's manual.

Powertrain

99T Engine: 6.7L 4V OHV Power Stroke V8 Turbo Diesel B20
Includes Operator Commanded Regeneration (OCR), Diesel Exhaust Fluid (DEF) tank, intelligent oil-life monitor and manual push-button engine-exhaust braking.
Includes:
- Dual 68 AH/65 AGM Battery
44G Transmission: TorqShift 10-Speed Automatic
10R140 with neutral idle. Includes SelectShift and selectable drive modes: normal, tow/haul, eco, slippery roads and off-road.
X4L Limited Slip w/4.30 Axle Ratio
68M GVWR: 19,500 lb Payload Plus Upgrade Package
Includes upgraded frame, rear-axle and low deflection/high capacity rear

springs. Increases max RGAWR to 14, 706 lbs. Note: See Order Guide Supplemental Reference for further details on GVWR.

Wheels & Tires

TGK Tires: 225/70Rx19.5G BSW Traction (TGK)
Includes 4 traction tires on the rear and 2 traction tires on the front. Not recommended for over the road applications; could incur irregular front tire wear and/or NVH.
64Z Wheels: 19.5" x 6" Argent Painted Steel
Hub covers/center ornaments not included.

Seats & Seat Trim

1 Cloth 40/20/40 Split Bench Seat
Includes center armrest, cupholder, storage and driver's side manual lumbar.

Other Options

PAINT Monotone Paint Application
179WB 179" Wheelbase
STDRD Radio: AM/FM Stereo w/MP3 Player
Includes 6 speakers.
Includes:
- SYNC 4
Includes 8" LCD capacitive touchscreen with swipe capability, wireless phone connection, cloud connected, AppLink with app catalog, 911 Assist, Apple CarPlay and Android Auto compatibility and digital owner's manual.
67P Extra Heavy-Duty Front End Suspension - 7,500 GAWR
Includes upgraded front axle and max 7,500 lbs. Front springs/GAWR rating for configuration selected. Incomplete vehicle package - requires further manufacture and certification by a final stage manufacturer.
535 High Capacity Trailer Tow Package
Includes trailer brake wiring kit and upgraded rear axle. Increases GCW from 32,500 lbs. to 40,000 lbs. Note: Salesperson's Portfolio or Trailer Towing Guide should be consulted for specific trailer towing or camper limits and corresponding required equipment, axle ratios and model availability. See Supplemental Reference for vehicle height consideration
41H Engine Block Heater
41P Transfer Case Skid Plates
61J 6-Ton Hydraulic Jack
86M Dual 68 AH/65 AGM Battery
67B 410 Amp Dual Alternators
Includes 250 Amp + 160 Amp.
872 Rear View Camera & Prep Kit
Pre-installed content includes cab wiring and frame wiring to the rear most cross member. Upfitters kit includes camera with mounting bracket, 20' jumper wire and camera mounting/aiming instructions.
41A Rapid-Heat Supplemental Cab Heater
Includes:
- 410 Amp Dual Alternators
Includes 250 Amp + 160 Amp.
43C 120V/400W Outlet
Includes 1 in-dash mounted outlet.

Includes:
- Dual 68 AH/65 AGM Battery
61L Front Wheel Well Liners (Pre-Installed)
153 Front License Plate Bracket
Standard in states requiring 2 license plates and optional to all others.

Fleet Options

47J Fire/Rescue Prep Pkg w/EPA Special Emissions (LPO)
Requires valid FIN code.
Includes upgraded front springs/GAWR rating, please see Supplemental Order Guide or visit fordbbas.com for complete details. Incomplete vehicle package - requires further manufacture and certification by a final stage manufacturer. Ford urges Fire/Rescue vehicle manufacturers to follow the recommendations of the Ford Incomplete Vehicle Manual and the Ford Truck Body Builders Layout Book (and pertinent supplements). Note 1: Stationary Elevated Idle Control (SEIC) has been integrated into the engine control module. Note 2: Engine calibration significantly reduces the possibility of depower mode when in stationary PTO operation. Note 3: Must meet the definition of an emergency vehicle, an Ambulance or Fire Truck per 40 CFR 86.1803.01 in the federal register. Note 4: California Code of Regulations allows for the sale of federally certified emergency vehicles in California.
Includes:
- 410 Amp Dual Alternators
Includes 250 Amp + 160 Amp.
WARANT Fleet Customer Powertrain Limited Warranty
Requires valid FIN code.
Ford is increasing the 5-year 60,000-mile limited powertrain warranty to 5-years, 100,000 miles. Only Fleet purchasers with a valid Fleet Identification Number (FIN code) will receive the extended warranty. When the sale is entered into the sales reporting system with a sales type fleet along with a valid FIN code, the warranty extension will automatically be added to the vehicle. The extension will stay with the vehicle even if it is subsequently sold to a non-fleet customer before the expiration. This extension applies to both gas and diesel powertrains. Dealers can check for the warranty extension on eligible fleet vehicles in OASIS. Please refer to the Warranty and Policy Manual section 3.13.00 Gas Engine Commercial Warranty. This change will also be reflected in the printed Warranty Guided distributed with the purchase of every new vehicle.

Emissions

425 50-State Emissions System

Exterior Color

Z1_01 Oxford White

Interior Color

1S_06 Medium Dark Slate w/Cloth 40/20/40 Split Bench Seat

Selected Equip & Specs

Dimensions

• Conventional Capacity: 18,500 lbs. *** GCWR: 37,000 lbs. * Fifth-wheel towing capacity: 27,900 lbs. * Gooseneck towing capacity: 27,900 lbs.** • Vehicle body length: 265" • Vehicle body width: 80" • Vehicle body height: 82" • Wheelbase: 179" • Front track: 75" • Rear track: 74" • Vehicle turning radius: 26' • Cab to axle: 60" • Rear tire outside width: 94" • Axle to end of frame: 47" • Frame section modulus: 13 cu.in. • Frame yield strength (psi): 50000 • Frame rail width: 34" • Front bumper to front axle: 38" • Front bumper to back of cab: 158" • Front brake diameter: 15.4" • Rear brake diameter: 15.8" • Interior cargo volume with seats folded: 52 cu.ft. • Max interior cargo volume: 52 cu.ft. • Total passenger volume: 131.7 cu.ft. • Headroom first-row: 40.8" • Headroom second-row: 40.4" • Leg room first-row: 43.9" • Leg room second-row: 43.6" • Shoulder room first-row: 66.7" • Shoulder room second-row: 65.9" • Hip room first-row: 62.5" • Hip room second-row: 64.7"

Powertrain

*** Powerstroke 6.7L V-8 diesel direct injection, DEVCT intercooled turbo, diesel, engine with 330HP** • Engine cylinders: V-8 *** Compression ignition system * Horsepower: 330 HP@2200 RPM * Torque: 950 lb.-ft.@1850 RPM * Engine block heater** • Radiator • Auxiliary power take-off *** Engine retarder system** • TorqShift 10-speed automatic • Part-time 4WD • Four-wheel drive *** Recommended fuel: diesel * Mechanical limited slip differential** • Driveline managed traction control • Auto locking hub control • Electronic transfer case shift

Fuel Economy and Emissions

*** Diesel secondary fuel type** • Federal emissions

Suspension and Handling

• Firm ride suspension • Heavy-duty front shock absorbers • Heavy-duty rear shock absorbers

Driveability

• 4-wheel disc brakes • Front and rear ventilated disc brakes • 4-wheel antilock (ABS) brakes • Four channel ABS brakes • Brake assist system • Hill Start Assist • Mono-beam rigid axle front suspension • Front anti-roll bar • Front coil springs *****

Rigid axle rear suspension • Leaf spring rear suspension • Rear anti-roll bar • Hydraulic power-assist steering system • Re-circulating ball steering • 2-wheel steering system

Body Exterior

• Trailer wiring harness • 4 doors • Clearcoat paint • Monotone paint • Black fender flares • Black side window trim • Black windshield trim • Black door handles • Black front bumper • Black front bumper rub strip • 2 front tow hooks • Black grille • Black door mirrors • Manual extendable trailer mirrors • Convex spotter in driver and passenger side door mirrors • Turn signal indicator in door mirrors • Conventional left rear passenger door • Conventional right rear passenger door *** LT225/70RS19.5 AT BBSW front and rear tires** • 19.5 x 6-inch front and dual rear argent steel wheels

Convenience

• Power door locks with 2 stage unlocking • Keyfob activated door locks • All-in-one remote fob and ignition key • Cruise control with steering wheel mounted controls • FordPass Connect smart device engine start control • Day/Night rearview mirror • Power first-row windows • Fixed rear windshield • Illuminated locking glove box • Illuminated glove box • Front beverage holders • Rear beverage holders • 8 beverage holders • Instrument panel covered bin • Dashboard storage • Retained accessory power • PRND in IP • Trip computer • Upfitter switches • Over the air updates

Comfort

• Manual climate control • Cabin air filter • Rear under seat climate control ducts *** Additional in-cabin heater** • Cloth headliner material • Full headliner coverage • Full vinyl floor covering • Full floor coverage *** Cloth rear seat upholstery** • Carpet rear seatback upholstery • Manual tilting steering wheel • Manual telescopic steering wheel • Urethane steering wheel

Seats and Trim

• Seating capacity: 6 • 40-20-40 split-bench front seat • Split-bench front seat • Driver seat with 4-way directional controls • Front passenger seat with 4-way directional controls • Height adjustable front seat head restraints • Manual front seat head restraint control • Front seat center armrest • Front seat armrest storage • Manual reclining driver seat • Manual driver seat fore/aft control • Manual reclining passenger seat • Manual passenger seat fore/aft control • Fixed rear seats • Split-bench rear seat • Height adjustable rear seat head restraints • Manual driver seat lumbar *** Cloth front seat upholstery**

Entertainment Features

• 2 total number of 1st row displays • 8 inch primary LCD display • Primary monitor touchscreen • AM/FM stereo radio • Seek scan • SYNC 4 external memory control • Speakers number: 6 • Standard grade speakers • Steering wheel mounted audio controls • SYNC 4 voice activated audio controls • Speed sensitive volume • Wireless audio streaming • Fixed audio antenna

Lighting, Visibility and Instrumentation

• Digital/analog instrumentation display • Configurable instrumentation gauges • Trip odometer • In-radio display clock • Compass • Exterior temperature display • Vehicle systems monitor • Gauge cluster display size (inches): 4.20 • Tachometer • Engine/electric motor temperature gauge *** Turbo/supercharger boost gauge** • Transmission fluid temperature gauge • Engine hour meter *** Diesel exhaust fluid (def) gauge** • Light tinted windows • Aero-composite headlights • Halogen headlights • Autolamp auto on/off headlight control • Multiple enclosed headlights • Delay-off headlights • DRL preference setting • Variable intermittent front windshield wipers • Front reading lights • Illuminated entry • Rear reading lights • Variable instrument panel light • Daytime running lights • Cab clearance lights • Remote activated perimeter approach lighting • Fade interior courtesy lights

Technology and Telematics

• SYNC 4 911 Assist emergency SOS system via mobile device • SYNC 4 handsfree wireless device connectivity • SYNC 4 AppLink/Apple CarPlay/Android Auto smart device mirroring • FordPass Connect 5G mobile hotspot internet access • 2 USB ports

Safety and Security

• Driver front impact airbag • Seat mounted side impact driver airbag • Safety Canopy System curtain first and second-row overhead airbags • Passenger front impact airbag • Seat mounted side impact front passenger airbag • 6 airbags • Front height adjustable seatbelts • SecuriLock immobilizer • Remote panic alarm • Lane Departure Warning • Ford Co-Pilot360 - Pre-Collision Assist with Automatic Emergency Braking (AEB) forward collision mitigation *** Rear mounted camera** • Manual rear child safety door locks

Dimensions

General Weights

*** Curb weight 8,416 lbs. * Rear curb weight 3,467 lbs.**
*** GVWR 19,500 lbs. * Payload 11,290 lbs.**

Trailering Weights

*** Fifth-wheel towing capacity 27,900 lbs. * Gooseneck towing capacity 27,900 lbs.**
Conventional capacity 18,500 lbs. *** GCWR 37,000 lbs.**

Front Weights

*** Front curb weight 4,949 lbs. * GAWR front 7,500 lbs.**
*** Axle capacity front 7,500 lbs. * Spring rating front 7,500 lbs.**
Tire/wheel capacity front 7,500 lbs.

Rear Weights

*** GAWR rear 14,706 lbs. * Axle capacity rear 14,706 lbs.**
*** Spring rating rear 14,706 lbs.** Tire/wheel capacity rear 15,000 lbs.

Off Road

Min ground clearance 8.2"

Exterior Measurements

Vehicle body length 265" Vehicle body width 80"
Vehicle body height 82" Wheelbase 179"
Front brake diameter 15.4" Rear brake diameter 15.8"
Rear frame height loaded 29" Rear frame height unloaded 34"
Front track 75" Rear track 74"
Vehicle turning radius 26' Cab to axle 60"
Rear tire outside width 94" Axle to end of frame 47"
Frame section modulus 13 cu.in. Frame yield strength (psi) 50000

Frame rail width 34" Front bumper to front axle 38"
Front bumper to back of cab 158"

Interior Measurements

Max interior cargo volume 52 cu.ft. Interior cargo volume with seats folded 52 cu.ft.

Interior Volume

Total passenger volume 131.7 cu.ft.

Headroom

Headroom first-row 40.8" Headroom second-row 40.4"

Legroom

Leg room first-row 43.9" Leg room second-row 43.6"

Shoulder Room

Shoulder room first-row 66.7" Shoulder room second-row 65.9"

Hip Room

Hip room first-row 62.5" Hip room second-row 64.7"

Powertrain

Engine

*** Engine Powerstroke 6.7L V-8 diesel direct injection, DEVCT intercooled turbo, diesel, engine with 330HP**
*** Valves per cylinder 4**
Engine cylinders V-8 Engine location Front mounted engine
*** Ignition Compression ignition system** Engine mounting direction Longitudinal mounted engine
Engine block material Iron engine block Cylinder head material Aluminum cylinder head

Engine Specs

*** Displacement 6.7L * cc 405.9 cu.in.**
*** Bore 3.9" * Stroke 4.25"**
*** Compression ratio 15.8** SAEJ1349 AUG2004 compliant

Engine Power

*** Horsepower 330 HP@2200 RPM * Torque 950 lb.-ft.@1850 RPM**

Alternator

*** Alternator amps 250A * Alternator type Dual alternator**
*** Alternator rating 160A**

Battery

*** Battery amps 68Ah * Battery type Dual lead acid battery**

Battery rating 750CCA Battery run down protection Battery run down protection

Engine Extras

*** Block heater Engine block heater** Radiator Radiator
Auxiliary power take-off Auxiliary power take-off *** Engine retarder Engine retarder system**

Transmission

Transmission TorqShift 10-speed automatic Transmission electronic control Transmission electronic control

Overdrive transmission Overdrive transmission Lock-up transmission Lock-up transmission
First gear ratio 4.615 Second gear ratio 2.919
Third gear ratio 2.132 Fourth gear ratio 1.773
Fifth gear ratio 1.519 Sixth gear ratio 1.277
Reverse gear ratio 4.695 Seventh gear ratio 1
Eighth gear ratio 0.851 Ninth gear ratio 0.687
Tenth gear ratio 0.632 Stall ratio 1.97
Selectable mode transmission Selectable mode transmission
Sequential shift control SelectShift Sequential shift control

Transmission oil cooler Transmission oil cooler PTO transmission provision PTO transmission provision

Drive Type

4WD type Part-time 4WD Drive type Four-wheel drive

Drivetrain

*** Axle ratio 4.3**

Exhaust

Tailpipe Stainless steel single exhaust

Fuel

*** Fuel type diesel**

Fuel Tank

*** DEF capacity 7.20 gal.** Fuel tank capacity 40.00 gal.

Drive Feature

*** Limited slip differential Mechanical limited slip differential**
Traction control Driveline managed traction control
Locking hub control Auto locking hub control Transfer case Electronic transfer case shift

Provisions

*** Provisions Police/fire provisions**

Fuel Economy and Emissions

Fuel Economy

*** Secondary fuel type Diesel secondary fuel type**

Emissions

Emissions Federal emissions

Suspension and Handling

Suspension

Suspension Firm ride suspension Front shock absorbers Heavy-duty front shock absorbers
Rear shock absorbers Heavy-duty rear shock absorbers

Driveability

Brakes

Brake type 4-wheel disc brakes Ventilated brakes Front and rear ventilated disc brakes
ABS brakes Four channel ABS brakes ABS brakes 4-wheel antilock (ABS) brakes

Brake Assistance

Hill start assist Hill Start Assist Brake assist system Brake assist system

Front Suspension

Anti-roll bar front Front anti-roll bar Suspension ride type front Mono-beam rigid axle front suspension

Front Spring

*** HD front springs Heavy-duty front springs** Springs front Front coil springs

Rear Spring

Springs rear Rear leaf springs Rear springs Heavy-duty rear springs

Rear Suspension

Anti-roll bar rear Rear anti-roll bar Suspension type rear Leaf spring rear suspension
*** Suspension ride type rear Rigid axle rear suspension**

Steering

Steering Hydraulic power-assist steering system

Steering type Re-circulating ball steering
Steering type number of wheels 2-wheel steering system

Exterior

Front Wheels

Front wheels diameter 19.5" Front wheels width 6"

Rear Wheels

Rear wheels diameter 19.5" Rear wheels width 6"

Front And Rear Wheels

Appearance argent Material steel

Front Tires

Aspect 70 Diameter 19.5"
Sidewalls BSW Speed S
*** Tread AT** Type LT
Width 225mm *** Front wheel - RPM 645**

Rear Tires

Aspect 70 Diameter 19.5"
Sidewalls BSW Speed S
*** Tread AT** Type LT
Width 225mm *** Rear wheel - RPM 645**

Body Exterior

Trailering

Towing wiring harness Trailer wiring harness Towing brake controller Trailer brake controller
Towing trailer sway Trailer sway control

Exterior Features

Number of doors 4 doors *** Skid plate 1 underbody skid plate**
Front splash guards Front splash guards *** License plate front bracket Front license plate bracket**

Body

Body panels Aluminum body panels with side impact beams

Mirrors

Turn signal in door mirrorsTurn signal indicator in door mirrors
Convex spotter Convex spotter in driver and passenger side door mirrors

Tires

Front tires LT load rating G Rear tires LT load rating G

Wheels

Dual rear wheels Dual rear wheels

Convenience

Door Locks

Door locks Power door locks with 2 stage unlocking
Keyfob door locks Keyfob activated door locks
All-in-one keyAll-in-one remote fob and ignition key

Cruise Control

Cruise control Cruise control with steering wheel mounted controls

Key Fob Controls

Fob remote engine controls FordPass Connect smart device engine start control

Rear View Mirror

Day/Night rearview mirror Day/Night rearview mirror

Exterior Mirrors

Door mirrors Power door mirrors Folding door mirrors Manual folding door mirrors Heated door mirrors Heated driver and passenger side door mirrors

Front Side Windows

First-row windows Power first-row windows

Overhead Console

Overhead console Full overhead console Overhead console storage Overhead console storage

Passenger Visor

Visor passenger mirror Passenger visor mirror

Power Outlets

12V power outlets 2 12V power outlets *** 120V AC power outlets**
1 120V AC power outlet

Rear Windshield

Rear windshield Fixed rear windshield

Storage

Number of beverage holders 8 beverage holders Beverage holders Front beverage holders Beverage holders rear Rear beverage holders Glove box Illuminated locking glove box Illuminated glove box Illuminated glove box Instrument panel storage Instrument panel covered bin
Dashboard storage Dashboard storage

Windows Feature

One-touch up window Driver and passenger one-touch up windows
One-touch down window Driver and passenger

one-touch down windows

Windows Rear Side

Second-row windows Power second-row windows

Miscellaneous

Trip computer Trip computer PRND in IP PRND in IP
Upfitter switches Upfitter switches Accessory power Retained accessory power
Over the air updates Over the air updates

Comfort

Climate Control

Climate control Manual climate control Cabin air filter Cabin air filter
Rear under seat ducts Rear under seat climate control ducts
*** in-cabin heater Additional in-cabin heater**

Headliner

Headliner material Cloth headliner material Headliner coverage Full headliner coverage

Floor Trim

Floor covering Full vinyl floor covering Floor coverage Full floor coverage

Second-Row Seat Trim

*** Rear seat upholstery Cloth rear seat upholstery**
Rear seatback upholstery Carpet rear seatback upholstery

Steering Wheel

Steering wheel telescopic Manual telescopic steering wheel
Steering wheel material Urethane steering wheel
Steering wheel tilt Manual tilting steering wheel

Seats and Trim

Seat Capacity

Seating capacity 6

Front Seats

Front seat type Split-bench front seat Driver seat direction Driver seat with 4-way directional controls
Driver seat fore/aft control Manual driver seat fore/aft control
Passenger seat direction Front passenger seat with 4-way directional controls
Split front seats 40-20-40 split-bench front seat Reclining passenger seat Manual reclining passenger seat

Passenger seat fore/aft control Manual passenger seat fore/aft control
Front head restraints Height adjustable front seat head restraints
Front head restraint control Manual front seat head restraint control
Armrests front center Front seat center armrest
Armrests front storage Front seat armrest

storage

Reclining driver seatManual reclining driver seat

Rear Seats

Bench seats Split-bench rear seat Rear seats fixed or removable Fixed rear seats
Folding second-row seats 60-40 folding rear seats
Rear seat direction Front facing rear seat
Rear seat folding position Fold-up rear seat cushion
Rear head restraints Height adjustable rear seat head restraints
Rear head restraint control Manual rear seat head restraint control
Number of rear head restraints 3 rear seat head restraints

Lumbar Seats

Driver lumbar Manual driver seat lumbar

Front Seat Trim

*** Front seat upholstery Cloth front seat upholstery**
*** Front seatback upholstery Cloth front seatback upholstery**

Interior Accents

Interior accents Chrome interior accents

Gearshifter Material

Gearshifter material Urethane gear shifter material

Entertainment Features

LCD Displays

Primary monitor touchscreen Primary monitor touchscreen
Number of first-row LCD displays2 total number of 1st row displays
LCD primary display size 8 inch primary LCD display

Radio Features

External memory SYNC 4 external memory control
Seek scan Seek scan

Speakers

Speakers Standard grade speakers Speakers number 6

Audio Features

mounted audio controls
Speed sensitive volume Speed sensitive volume
Voice activated audio SYNC 4 voice activated audio controls
Wireless streaming Wireless audio streaming

Lighting, Visibility and Instrumentation

Instrumentation

Trip odometer Trip odometer Instrumentation display Digital/analog instrumentation display
Configurable instrumentation gauges Configurable instrumentation gauges

Instrumentation Displays

Temperature display Exterior temperature display
Systems monitor Vehicle systems monitor
Clock In-radio display clock Compass Compass

Instrumentation Gauges

Tachometer Tachometer Transmission temperature gauge Transmission fluid temperature gauge
*** Turbo gauge Turbo/supercharger boost gauge**
Engine/electric motor temperature gauge Engine/electric motor temperature gauge
Gauge cluster display size (inches) 4.20 Engine hour meter Engine hour meter
*** DEF fluid gauge Diesel exhaust fluid (def) gauge**

Instrumentation Warnings

Engine temperature warning Engine temperature warning
Oil pressure warning Oil pressure warning
Low fuel warning Low fuel warning Low brake fluid warning Low brake fluid warning
Battery charge warning Battery charge warning Headlights on reminder Headlights on reminder
Key in vehicle warning Key in vehicle warning Door ajar warning Door ajar warning
Service interval warningService interval indicator *** Low diesel exhaust fluid (DEF) warning Low diesel exhaust fluid (DEF) warning**

Glass

Tinted windows Light tinted windows

Headlights

Headlights Halogen headlights Headlight type Aero-composite headlights
Auto headlights Autolamp auto on/off headlight control
Multiple headlights Multiple enclosed headlights
Delay off headlights Delay-off headlights DRL preference setting DRL preference setting

Front Windshield

Wipers Variable intermittent front windshield wipers

Interior Lighting

Illuminated entry Illuminated entry Variable panel light Variable instrument panel light
Front reading lights Front reading lights Rear reading lights Rear reading lights

Lights

Running lights Daytime running lights Interior courtesy lights Fade interior courtesy lights
Clearance lights Cab clearance lights Perimeter approach lighting Remote activated perimeter approach lighting

Technology and Telematics

Connectivity

Handsfree SYNC 4 handsfree wireless device connectivity
Smart device integration SYNC 4 AppLink/Apple CarPlay/Android Auto smart device mirroring
Emergency SOS SYNC 4 911 Assist emergency SOS system via mobile device

Internet Access

Internet access FordPass Connect 5G mobile hotspot internet access

USB Ports

USB ports 2 USB ports

Safety and Security

Airbags

Front impact airbag driver Driver front impact airbag
Number of airbags 6 airbags
Front impact airbag passenger Passenger front impact airbag
Front side impact airbag driver Seat mounted side impact driver airbag
Front side impact airbag passenger Seat mounted side impact front passenger airbag
Overhead airbags Safety Canopy System curtain first and second-row overhead airbags

Seatbelts

Height adjustable seatbelts Front height adjustable seatbelts

Security System

Immobilizer SecuriLock immobilizer Remote panic alarm Remote panic alarm

Active Driving Assistance

Lane departure Lane Departure Warning Forward collision warningFord Co-Pilot360 - Pre-Collision Assist with Automatic Emergency Braking (AEB) forward collision mitigation

Cameras

*** Rear camera Rear mounted camera**

Occupant Safety

Child door locks Manual rear child safety door

Locks

Warranty

Standard Warranty

Basic Warranty

Basic warranty 36 months/36,000 miles

Powertrain Warranty

Powertrain warranty 60 months/60,000 miles

Corrosion Perforation

Corrosion perforation warranty 60 months/unlimited

Roadside Assistance Warranty

Roadside warranty 60 months/60,000 miles

Additional Warranty

Diesel Engine Warranty

Diesel engine warranty 60 months/100,000 miles

Wheels & Tires
TGK Tires: 225/70Rx19.5G BSW Traction (TGK)
Includes 4 traction tires on the rear and 2 traction tires on the front. Not recommended for over the road applications; could incur irregular front tire wear and/or NVH.
64Z Wheels: 19.5" Argent Painted Steel
Hub covers/center ornaments not included.

CAB TO AXLE DIMENSION

Cab to axle will be 60”.

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

A permanent label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid . . (if applicable)
- Pump priming system fluid, if applicable . . (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant . . (if applicable)
- Air conditioning lubrication oil . . (if applicable)
- Power steering fluid
- Cab tilt mechanism fluid . . (if applicable)
- Transfer case fluid . . (if applicable)
- Equipment rack fluid (if applicable)
- CAFS air compressor system lubricant . . (if applicable)
- Generator system lubricant . . (if applicable)
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

VEHICLE DATA PLATE

A permanent label in the driving compartment which indicates the following:

- Filter part numbers for the;
  - Engine
  - Transmission
  - Air
  - Fuel
- Serial numbers for the;
  - Engine
  - Transmission
- Delivered Weights of the Front and Rear Axles
- Paint Brand and Code(s)
- Sales Order Number

OVERALL HEIGHT, LENGTH DATA PLATE (US)

The fire apparatus manufacturer shall permanently affix a high-visibility label in a location visible to the driver while seated.

The label shall show the height of the completed unequipped vehicle in feet and inches (meters), the length of the completed vehicle in feet and inches (meters to nearest 1/10th), and the GVWR in tons (metric tons).

Wording on the label shall indicate that; "The information shown was current when the apparatus was manufactured. If the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate".

PERSONNEL CAPACITY

A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

SEAT BELT WARNING - FAMA06/07

A safety sign FAMA06 shall be visible from each seat that is not equipped with occupant restraint and therefore not intended to be occupied while the vehicle is in motion.

A safety sign FAMA07, which warns of the importance of seat belt use, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

EQUIPMENT MOUNTING FAMA10

A safety sign FAMA10, which warns of the need to secure items in the cab, shall be visible inside the cab.

FIRE SERVICE TIRES - FAMA12

A safety sign FAMA12, which warns of the special requirements for fire service–rated tires, shall be visible to the driver entering the cab of any apparatus so equipped.

HELMET WARNING - FAMA15

A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

CLIMBING METHOD - FAMA23

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

REAR STEP CROSSWALK WARNING - FAMA24

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

A final stage manufacturer vehicle certification label shall be provided and installed in the driver cab door jamb area.

OEM FRONT BUMPER REPLACEMENT

An SVI Extreme Contoured one-piece, fully welded steel construction front bumper shall be bolted in place of the OEM bumper. Two (2) 3/4" steel tow eyes shall be provided on front with 3/4" opening.

Bumper shall have a two-stage finish using epoxy pre-coating and high-grade textured black powder coating for durability and long lasting corrosion resistance.

FRONT BUMPER PUSH BAR / GRILLE GUARD

The front bumper shall be provided with a steel push bar / grille guard combination welded to bumper.

FRONT MOUNTED WINCH

The bumper extension shall be equipped with a Warn M12000, 12 volt electric, 12,000 lb. capacity winch.

The control of the winch shall be with a plug-in remote control unit. The unit shall have 12' of control cable, with forward, neutral and reverse dead man type hand control.

The winch shall be equipped with 125' of 3/8" galvanized cable. The cable shall end with a clamped type loop and a drop forged heavy duty hook. The cable shall feed through a full captive type 4-way roller and guide assembly.

BUMPER GROUND LIGHTS

SIREN SPEAKER

One (1) Whelen model SA314B 100 watt aluminum, 6.4" x 6.1" x 3.1" deep siren speaker shall be provided and located behind grille or front bumper with black epoxy coated finish.

The solid state siren speaker shall be vibration resistant. The SA314A shall comply with California Title XIII, Class A, and SAE J1849 requirements and with OSHA 1910.95 Guidelines regarding “Permissible Noise Exposure”. All mounting hardware shall be stainless steel and covered by a two year factory warranty.

The siren speaker shall be located on the streetside of front bumper.

One (1) Rigid Industries E-Series model 120313, 20" combination spot/flood LED light(s) with black housing color and cradle mount brackets shall be provided on front of vehicle. The E-Series 20" LED light(s) shall have 25,000 lumen output each.

Each light shall be wired directly to the 12 VDC electrical system with stranded copper wire. The floodlights shall be protected with circuit breakers rated at the proper amperage and wire size.

The Lights shall be controlled at the Switch Panel in Cab.

AIR INTAKE SYSTEM

An air filter shall be provided in the engine’s air intake system by the body builder. Air inlet restrictions shall not exceed the engine manufacturer’s recommendations.

The air inlet shall be equipped with a means of separating water and burning embers from the air intake system.

This requirement shall be permitted to be achieved by either of the following methods:

1. Provision of a device such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.
2. Provision of a multi screen ember separator capable of meeting the test requirements defined in the Parker Hannafin, Racor Division, publication LF 1093-90, *Ember Separation Test Procedure*, or an equivalent test.

EXHAUST

The exhaust system shall be as provided by cab/chassis manufacturer.

ZONE A - FRONT WARNING LIGHTS, UPPER

There shall be one (1) Whelen Justice JE0NFPA LED 44" lightbar permanently mounted on the accesory rack located on the front of the flat bed.

The lightbar configuration (streetside to curbside) shall be:

SECTION	INTERNAL COMPONENTS	LENS COLOR
1	Red Front Corner Linear LED	Clear
2	Red Linear LED	Clear
3	Clear Linear LED	Clear Linear LEDClear
4	Red Linear LED	Clear
5	Red Linear LED	Clear
6	Clear Linear LED	Clear
7	Red Linear LED	Clear
8	Red Front Corner Linear LED	Clear

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

See WeCad Drawing for Ordering

The lightbar(s) shall be separately controlled at switch panel in the cab.

ZONE A - FRONT WARNING LIGHTS

There shall be two (2) Whelen surface mount ION Series LED light(s) with wide angle optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns.

Each light shall have:
- Red LEDs
- Clear Lens
- Chrome Flange

The Lights shall be controlled at the Switch Panel in Cab.

ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

There shall be two (2) Whelen surface mount ION Series LED light(s) with wide angle optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns.

Each light shall have:
- Red LEDs
- Clear Lens
- Chrome Flange

The Lights shall be controlled at the Switch Panel in Cab.

GROUND CLEARANCE

A 2" suspension leveling lift shall be installed to level vehicle and increase ground clearance. The components shall be readily available, and not custom built. Payload must not be adversely affected by any changes in the suspension. Drive lines must not be adversely affected by any changes in the suspension.

COMMUNICATION RADIO/ANTENNA INSTALLATION

There shall be one (1) mobile communication radio(s) with antenna installed in the cab. The location of radio shall be determined by the Taos Pueblo at the pre-construction meeting. All required radio programming shall be responsibility of Taos Pueblo. Radio(s) may not be fully tested if no radio program is provided with radio and will be responsibility of Taos Pueblo after delivery.

Radio shall be installed per Manufacturer's requirements and wired for proper 12 volt power and ground.

- Radio shall be provided by Taos Pueblo.

SEAT BELT COLOR AND MOUNTING

The seat belt webbing color requirement of 14.1.3.3 shall not apply to vehicles with a GVWR of 19,500 lb (8,845 kg) or less.

Section 14.1.3.3 of the NFPA 1901 Standards, requires all seat belt webbing in cab to be bright red or bright orange in color, and the buckle portion of the seat belt shall be mounted on a rigid or semi rigid stalk such that the buckle remains positioned in an accessible location.

SEAT BELT WEB LENGTH - COMMERCIAL CAB

The chassis seat belt web length as supplied by the commercial chassis manufacturer will not be compliant to NFPA Standards 14.1.3.2 and 14.1.3.3.

Sections 14.1.3.2 and 14.1.3.3 of the NFPA 1901 standards, require the effective seat belt web length for a Type 1 lap belt for pelvic restraint to be a minimum of 60", and a Type 2 pelvic and upper torso restraint-style seat belt assembly to be a minimum of 110".

Per Taos Pueblo specification for a commercial chassis, this emergency vehicle may not have seat belts of this required length. These belts may not provide sufficient length for large firefighters in bunker gear. This specification for an emergency fire apparatus for these seat belts shall be non-compliant to NFPA 1901 standards, effective at the time of order.

SEAT BELT MONITORING SYSTEM - COMMERCIAL CAB

Per Taos Pueblo specification for a commercial chassis, this emergency vehicle may not have a seat belt monitoring system. Without this device, the driver must manually determine that all occupants are seated and belted before the apparatus is placed in motion. This specification for an emergency fire apparatus for the seat belt monitoring system shall be non-compliant to NFPA 1901 standards, effective at the time of order.

Section 14.1.3.9 of the NFPA 1901 Standards, requires that a seat belt warning system be provided. The seat belt warning device is intended to assist the driver or officer in determining whether all occupants are seated and belted before the vehicle is driven.

IGNITION KEY

If the vehicle is specified to have an ignition key it will be attached to steering column or dash with vinyl covered steel cable.

SIX (6) – LED TIRE PRESSURE VISUAL INDICATORS

Each tire valve stem shall be equipped with an LED Tire Alert (or equal), heavy duty valve cap LED indicator that indicates proper tire pressure. The LED Tire Alert valve cap is self-calibrating. When the cap is mounted on the valve stem the first time, it will memorize that tire pressure, and can be set to recognize a drop in pressure as little as 6 psi. It can be checked for functionality and battery condition by simply unscrewing the cap. If it is in working condition, it will immediately start blinking.

HELMET STORAGE, DRIVING AREA

No helmet storage is required in the cab driving area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

HELMET STORAGE, CREW AREA

No helmet storage is required in the cab crew area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

CAB TESTING CERTIFICATION

Section 14.3.2 of the NFPA 1901 standards, 2009 edition, require the cabs on apparatus with a GVWR greater than 26,000 lb. (11,800 kg) shall meet the requirements of one of the following sets of standards:

1) European Occupant Protection Standard ECE Regulation No. 29.
2) SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

Per Taos Pueblo specification for a commercial chassis, this emergency vehicle may not have a cab that has been tested to these standards. This specification for an emergency fire apparatus for the cab testing requirements shall be non-compliant to NFPA 1901 standards, effective at the time of the bid opening.

CAB PAINT

The finish paint and color as provided from the cab/chassis manufacturer shall be provided. Cab shall not be repainted.

(Note: Most departments do NOT find that the fleet paint finish from a commercial cab/chassis manufacturer is acceptable. The Body Builder will NOT be responsible for paint quality and finish issues.)

REFLECTIVE STRIPE - CAB DOOR INTERIOR

Any door of the apparatus designed to allow persons to enter or exit the apparatus shall have at least 96 in.2 (62,000 mm2) of retroreflective material affixed to the inside of the door.

The inside of each cab door shall have 4" Chevron style 3M Scotchlite 680 series graphic film.

This reflective chevron stripe shall alternate red and yellow in color.

CAB INTERIOR COMPONENT PAINT COLOR, OEM SUPPLIED

Powder coat shall be hammertone silver/grey. Cardinal T064-GR05

MUDFLAPS

There shall be 1/4" rubber mudflaps with logo provided and installed behind rear axle tires to prevent throwing road debris and lower road spray.

Front Cab Components: Not Provided

Located on floor forward facing center position shall be;

Located on floor forward facing driver position shall be;

Located on floor forward facing officer position shall be;

FUEL FILL

There shall be one (1) chassis supplied fuel fill mounted in the streetside exterior wheel well panel, behind the rear axle.

DEF FLUID FILL

The DEF fluid fill shall be as supplied by commercial cab/chassis manufacturer and located between the cab and body.

BODY

The importance of public safety associated with emergency vehicles requires that the construction of this vehicle meet the following specifications. These specifications are written to establish the minimum level of quality and design. All Bidders shall be required to meet these minimum requirements.

It is the intent of these specifications to fully describe the requirements for a emergency type vehicle. In order to extend the expected service life of this vehicle, the body module shall be removable from the chassis frame and be capable of being installed on a new chassis.

ALUMINUM FLATBED BODY

The body shall be a Highway Products, Inc. (or equal) aluminum flat bed 8'wide x 9'-3"long. A rear vertical tailboard light panel with required DOT lights shall be provided below rear of body. Body shall be mounted to chassis frame per manufacturers requirements.

- A rear hose storage shall be provided to hold three (3) 2 1/2" x 8' suction hoses with dividers inbetween.

Hose must be stored with Female Couplings Rearward

- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.

REFLECTIVE STRIPE REQUIREMENTS

Material

All retroreflective materials shall conform to the requirements of ASTM D4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D4956, Section 6.1.1, shall have a minimum coefficient of retro-reflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D4956, Section 6.1.1.

Minimum Requirements

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the vehicle, not including mirrors or other protrusions.

The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

A graphic design shall be permitted to replace all or part of the required striping material if the design or combination thereof covers at least the same perimeter length(s).

GRAPHICS PROOF

A color graphics proof of the reflective striping layout shall be provided for approval by Taos Pueblo prior to installation. The graphics proof shall be submitted to Taos Pueblo on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details. **Note:** The graphics color proof may not reflect the correct paint break lines on the chassis and body please refer to the paint section of your specifications for correct paint break lines.

REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material shall be 4" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be red in color.

REFLECTIVE STRIPE - BODY SIDES

The reflective stripe material shall be 4" wide, 3M Scotchlite 680 series graphic film.

Install Reflective in the "C" Channel of the flatbed

- This reflective stripe shall be red in color.

CHEVRON REFLECTIVE STRIPING- FLAT BED TYPE 6 ENGINE

All accessible portions of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width.

Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use.

The stripe material shall be 3M Diamond Grade.

This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

The stripe shall remain in a straight line from the front of the front of cab to the rear body.

REFLECTIVE STRIPE - REAR OF BODY

A 4" minimum reflective stripe shall be provided on rear face of body.

- The stripe material shall be 3M Scotchlite 680 series graphic film.
- This reflective stripe shall be red in color.

CAB ROOF LETTERING

There shall be four (4) 22" high reflective letters furnished and installed on the vehicle.

"1950"

- This reflective lettering shall be black in color.

SIDE CAB DOOR LETTERING

There shall be sixty (60) 3" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be white in color.

There shall be eight (8) 4" high reflective letters furnished and installed on the vehicle.

"1950" Streetside & Curbside of chassis front fenders

- This reflective lettering shall be black in color.

CUSTOM DECAL LOGO - 12" -18"

One (1) custom designed 12" - 18" 3M Scotchlite type retroreflective logo shall be provided and located on the completed vehicle. The exact design and/or artwork shall be provided by the Taos Pueblo prior to construction.

One (1) copy of the above custom logo shall be provided and located on the completed vehicle as directed by Taos Pueblo.

FLAT BED OPTION (STREETSIDE FORWARD)

- One (1) purchased equipment box shall be provided with lift-up door and positive latch. Box exterior dimensions shall be 72" x 25" x 23.5".
- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.
- One (1) purchased equipment box shall be provided with drop-down door and positive latch. Box exterior dimensions shall be 72" x 16.5" x 23.5".
- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.
- One (1) purchased open top basket shall be provided with hex punched pattern. Basket exterior dimensions shall be 72"l x 8"h x 14"w.

FLAT BED OPTION (CURBSIDE FORWARD)

- One (1) purchased equipment box shall be provided with lift-up door and positive latch. Box exterior dimensions shall be 72" x 25" x 23.5".
- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.
- One (1) purchased equipment box shall be provided with drop-down door and positive latch. Box exterior dimensions shall be 72" x 16.5" x 23.5".
- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.
- One (1) purchased open top basket shall be provided with hex punched pattern. Basket exterior dimensions shall be 72"l x 8"h x 14"w.

FLAT BED OPTIONS (CURBSIDE REAR)

- One (1) purchased equipment box shall be provided with drop-down door and positive latch. Box exterior dimensions shall be 23.5"w x 16.5"h x 36"d.
- One (1) OnScene Access white LED light(s) mounted in cabinet(s).

– Two (2) slide-out tray(s) shall be provided in storage box.

BODY STORAGE REAR (CENTER)

- The area above frame shall be provided with fire suppression equipment as specified.
- One (1) purchased equipment box shall be provided with Lift Up door and positive latch. Box exterior dimensions shall be 44"w x 19"h x 44"d.

The Equipment box shall be located on top of the water tank

- One (1) OnScene Access white LED mounted at the top of the compartment toward the door opening.
- Storage shall be provided for three (2) 2-1/2" x 8' hard suction hose at the rear of the flatbed, between the frame rails with a drop down aluminum door.

BODY OPTIONS AND UPGRADES

PLASTIC FLOOR AND SHELF TILE

Dri-Dek 12" x 12" x 9/16", self-draining plastic inter-locking material shall be cut to size and cover all compartment floors, shelves, and trays.

- The plastic floor tile shall be black.
- The plastic edge trim shall be black.

DRIP TORCHES AND HOLDERS

Two (2) Panama Forestry Supply Drip Torches shall be supplied and installed in two (2) Panama Forestry Supply Drip Torch Holders.

The Panama Stainless Steel Wide Mouth Drip Torch Model, 12” Burner. The supplied iller caps recessed neoprene gasket prevents fuel leakage. Brass regulator valve controls fuel flow. Safety loop in burner prevents flashback. Uses diesel or stove oil. Stainless steel tank has 2-3/4”W easy-fill opening. Three burner lengths available. Streamlined burner assembly won’t snag in bushes. Fiberglass wick. Meets D.O.T. approval for transport of flammable fuel UN# 1A1-Y-150

Drip Torches to be stored Curbside rear on top of the 16 1/2" tall compartment.

SPARE TIRE STORAGE

A bracket to store the spare tire shall be constructed and supplied on the streetside and curbside of the vehicle, beneath the flat bed, between the rear of the cab and the front of the rear tire.

LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body shall be run in full length electrical wiring raceway down each side of body.

Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 % of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 %. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, *Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring.*

Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable,* or SAE J1128, *Low Voltage Primary Cable,* type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures. The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer’s instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.

Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

Circuits shall be provided with properly rated low voltage over-current protective devices. Such devices shall be readily accessible and protected against heat in excess of the over-current device’s design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

1) SAE J156, *Fusible Links*
2) SAE J553, *Circuit Breakers*
3) SAE J554, *Electric Fuses (Cartridge Type)*
4) SAE J1888, *High Current Time Lag Electric Fuses*
5) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125 % of maximum current for which the circuit is protected.

Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

1) The propulsion engine and transmission
2) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
3) The radio(s) at a duty cycle of 10 percent transmit and 90 % receive (for calculation and testing purposes, a default value of 5 A continuous)
4) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
5) The minimum optical warning system, where the apparatus is blocking the right-of way
6) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
7) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

A voltmeter shall be mounted on the driver’s instrument panel to allow direct observation of the system voltage.

Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

12 VOLT DIAGNOSTIC RELAY CONTROL CENTER

The 12 volt power distribution shall be conveniently located with easy access for service. All relays and circuit breakers shall be plug-in type allowing for removal for repairs without necessitating soldering or tools. The sockets mounts for both the relays and circuit breakers shall be of a design that permits the use of standard automotive type components.

The 12 volt distribution panel shall utilize printed circuit boards mounted in high strength enclosure. Each printed circuit board shall be provided with twelve (12) heavy duty independent switching relays. Each relay shall have the ability to be configured either normally open or normally closed and be protected by a 20 amp automatic reset breaker. Each circuit will be provided with a LED for visual diagnostic.

Power distribution panel shall be located in apparatus body within a protected enclosure with removable or hinged cover.

CAB CONSOLE

A center cab console shall be provided between the Driver's and Officer's seats extending to rear wall of cab. Console shall be as large as possible and fabricated of 1/8" smooth aluminum. A textured powder coat paint finish shall be provided for durability and finished appearance.

Console shall include;

- Forward section of cab console shall include;
  - **ROCKER SWITCH PANEL** The control of the 12 volt equipment installed on chassis and body shall be centrally located in the cab. The individual rocker style switches shall be located on a separate electrical panel, complete with LED backlit name tags describing function of each individual switch. The back lighting shall have two (2) levels of intensity, low level lights activated when the vehicle lights or ignition switch is turned "On", and high level lights activated when individual switch is turned "On". An internally lighted rocker switch shall be furnished to the left of specified emergency lighting switches, and identified as "MASTER EMERGENCY SWITCH". Switch circuitry shall be on a printed circuit board.
- Forward section, driver side of cab console shall include;
  - No components provided at this position.
- Forward section, officer side of cab console shall include;
  - No components provided at this position.
- Cab console, panel position forward shall include;
- There shall be one (1) communications radio and/or siren 3" filler plate(s) with black powdercoat paint finish provided for future radio/siren location in specified console.

- Cab console, panel position center shall include;
- There shall be one (1) communications radio and/or siren 3" filler plate(s) with black powdercoat paint finish provided for future radio/siren location in specified console.
- Cab console, panel position rearward shall include;

ELECTRONIC SIREN

One (1) Whelen model 295SLSA1 electronic siren control with selectable 100 or 200 watt output, hands-free operation, user selectable siren tones, park kill, and standard hard wired microphone shall be provided and installed in cab within easy reach of Driver. Siren power shall be wired through the master warning light switch.

- There shall be one (1) communications radio and/or siren 3" recess mount(s) with black powdercoat paint finish in specified console.

The specified siren functions shall be controlled by siren mounted switches.

- Cab console, center position forward shall include;
  - No components provided at this position.
- Cab console, center position center shall include;
  - No components provided at this position.
- Cab console, center position rearward shall include;
  - No components provided at this position.
- Cab console, rear position shall include;
- Cab console area provided with open storage area.

ELECTRICAL SYSTEM MANAGER

LOAD MANAGEMENT

If the total continuous electrical load exceeds the minimum continuous electrical output rating of the installed alternator(s), an Innovative Controls automatic electrical load management system shall be required. The minimum continuous electrical loads shall not be subject to automatic load management.

The apparatus 12 volt electrical system shall be provided with a system manager for:

- Monitoring chassis battery voltage
- Shedding pre-determined electrical circuits
- Sequencing pre-determined electrical circuits
- Automatically controlling chassis engine fast-idle
- Monitor master switch and parking brake applications

- Automatically control warning light modes ("Calling-For" and "Blocking Right of Way")
- Provide low voltage alarm
- Programmable control circuits
- Remote system status indicator panel

System manager shall perform all electrical functions required by current NFPA 1901 Standards.

BATTERY MONITORING

The system manager shall monitor the vehicle battery voltage. When electrical loads exceed the alternator output and the voltage drops, the load manager shall start shutting down electrical outputs. The system shall shut down only as many outputs required to maintain the system voltage. A special indicator to show different states of the electrical system by flashing at rate proportional to the battery discharge.

LOAD SEQUENCING AND SHEDDING

The system shall be capable of sequentially switching and shedding 12 volt loads. The Master light switch starts the sequential switch when it is turned "On". Likewise turning the Master Switch "Off" will sequentially de-energize the loads.

BATTERY SYSTEM

Any body builder supplied battery connections shall be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables shall provide maximum power to the electrical system. Where required, the cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

If an enclosed battery compartment is provided, it shall be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries shall be protected against vibration and temperatures that exceed the battery manufacturer’s recommendation.

BATTERY SWITCH

The chassis ignition key shall activate a heavy duty relay to provide 12 volt battery power to the vehicle.

– A green "BATTERY ON" pilot light shall be visible from the driver’s position.

BATTERY SOLENOID

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

BATTERY CONDITIONER

One (1) Kussmaul model Auto Charge 1000 single battery conditioner, with 120 VAC input and 15 amp, 12 volt output shall be provided. This system shall monitor the condition of batteries and provide an electrical current at variable rates to overcome battery failure.

Locate Battery conditioner on the rear of the center console.

BATTERY CHARGE INDICATOR

A Kussmaul 091-94-12 charge indicator display shall be provided and located near drivers' door area. This single battery system indicator is a suppressed zero bar graph voltage display which may be installed in any 12 volt system.

SHORE POWER INLET

One (1) Kussmaul 120 VAC, 20 amp Super Auto-Eject shore power inlet(s) shall be provided. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged.

The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

- Auto eject inlet cover color shall be yellow.
- The shore power inlet shall be located on the streetside front of body, outboard of the cab.

(Front of Flatbed Headache Rack Streetside)

ENGINE COMPARTMENT LIGHT

Per current NFPA 1901 Standards there shall be an LED engine compartment light installed by the commercial chassis manufacturer or by the body manufacturer.

CAB HAZARD WARNING LIGHT

A Truck-Lite red LED flashing light shall be provided and located in the driving compartment and be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

- Any passenger or equipment compartment door is not closed.
- Any ladder or equipment rack is not in the stowed position.
- Stabilizer system is not in its stowed position.
- Powered light tower is not stowed.
- Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

Compartments and equipment meeting all of the following conditions shall be permitted to be exempt from being wired to the hazard light:

- The volume is less than or equal to 4 ft3 (0.1 m3).
- The compartment has an opening less than or equal to 144 in.2 (92,900 mm2).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

The hazard light shall be labeled; "Do not move apparatus when light is on."

In addition, label shall be in both English/French for units built for Canada; *"Ne pas deplacer l'engin lorsque la lumiere est allumee."*

An audible alarm shall be provided for the door ajar light.

BACK-UP ALARM

The body manufacturer shall furnish and install one (1) 107 dB(A) electronic back-up alarm. Back-up alarm to actuate automatically when the transmission gear selector is placed in reverse.

REAR VIEW CAMERA

The cab chassis provided rear backup camera shall be installed on the rear of the body.

- The camera image shall be displayed on chassis supplied display located within the driver's range of view.

TAIL LIGHTS

Rear body tail lights shall be provided by body manufacturer.

MARKER LIGHTS

The body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS) regulations. Clearance lights shall be wired to the headlight circuit of the chassis.

CAB STEP LIGHTS / GROUND LIGHTS

There shall be six (6) OnScene 8" Access white LED light(s) installed on the vehicle (equally divided per side) capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting designed to provide illumination on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened.

One (1) light located underneath each cab door.

LICENSE PLATE LIGHT

One (1) Arrow #437 chrome plated LED license plate light shall be installed on the rear of the body. License plate light shall be wired to the headlight circuit of chassis. A fastener system shall be provided for license plate installation.

There shall be two (2) Whelen Pioneer Micro model MPPBBS. Black powder coat housing with black back cover pedestal mount. Optics are a 8 degree spotlight pattern. Lights shall be 12 VDC, 3.5 amp. Lighthead dimensions 5-1/16" wide x 8-11/16" high x 3-3/16" deep.

Install One (1) Streetside, One (1) Curbside on Upper Tread Brite compartments pointing rearward.

The Lights shall be controlled at the Switch Panel in Cab.

WARNING LIGHT PACKAGE

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four (4) warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four (4) zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two (2) separate signaling modes during emergency operations. One (1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One (1) mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. 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 the 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. The system shall be permitted to have a method of modifying the two (2) signaling modes.

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

Steadily burning, non flashing optical sources shall be permitted to be used.

UPPER LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

ZONE A - FRONT WARNING LIGHTS

See Chassis Modification section for cab mounted warning lights.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen surface mount ION Series LED light(s) with wide angle optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns.

Each light shall have:
- Red LEDs
- Clear Lens
- Chrome Flange

Install Upper Zone C Warning Lights on the rear of the Upper Treadbright compartments one (1) Streetside, One (1) Curbside

The Lights shall be controlled at the Switch Panel in Cab.

LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1600 mm) above level ground.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

ZONE A - FRONT WARNING LIGHTS

ZONES B AND D - BODY LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen surface mount ION Series LED light(s) with wide angle optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns.

Each light shall have:
- Red LEDs
- Clear Lens
- Chrome Flange

The Lights shall be controlled at the Switch Panel in Cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen surface mount ION Series LED light(s) with wide angle optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns.

Each light shall have:
- Red LEDs
- Clear Lens
- Chrome Flange

The Lights shall be controlled at the Switch Panel in Cab.

ALUMINUMSTEP COVER OVER PUMP ENGINE AND PLUMBING

There shall be an aluminum step cover installed over the slide in pump and plumbing to protect the pump and plumbing and aid in accessing the storage box located over the water tank.

Similar to Red White and Blue

CUSTOM SLIP-IN SYSTEM

The pump shall be a Waterax BB-23VX with Briggs & Stratton 23HP engine.

Pump Performance and Rating:

The pump/engine shall perform to the standards of ISO 9 and NFPA 1906 medium pressure rating of 50 GPM. Typical pump performance from 5 foot draft under standard NFPA conditions shall be 65 GPM @ 350 PSI, 95 GPM @ 250 PSI, 105 GPM @ 150 PSI, and 105 GPM @ 100 PSI.

The pump shall provide a maximum pressure of 440 PSI and a maximum flow of 106 GPM. It shall be capable of operating to a maximum pressure of 600 PSI and be capable of passing a hydrostatic test of 550 PSI for 10 minutes per NFPA 1906 specifications – NO EXCEPTIONS.

Pump Suction/Discharge Ports:

The pump intake shall be a 2” Male NPSH hose thread and be an integral part of the pump intake cover. The pump discharge shall be a 1-1/2” Male NPSH hose thread and be an integral part of the pump body. The pump intake and discharge shall be in locations where applicable hose thread adapters can be installed without interference.

Pump:

The pump shall be a 4-stage centrifugal pump with the pump body, diffusers, and impellers made of an anodized corrosive resistance aluminum. The impeller must be aluminum to match the pump body and diffusers in order to prevent galvanic corrosion from taking place between pump components The impellers shall be 3.67 inches in diameter.

The pump shaft shall be stainless steel supported by two maintenance free bearings and shall not be co-linear to the engine’s drive shaft. A sealed roller bearing shall be located externally from the pump and a sintered bronze bushing

shall be located within the pump cover. In addition, the pump seal shall be a mechanical rotary seal, shall be externally pressurized and shall incorporate a blister- resistant carbon seal face, silicon carbide seat, and fully integrated drive bushing

A 1-1/2 NPSH priming port shall be located on the top side of the pump near the intake cover.

The pump shall be coupled to a vertical belt driven speed increaser with a quick release clamp capable of being removed by hand and without any additional tools

The quick release clamp system shall allow for the entire pump assembly, pump body with all its internal and external components, to be removable and capable of being service at a location away from the gasoline engine and fire apparatus upon which it was part of. It shall also allow for the swapping out of the same or different performance pump assemblies within a minute's time

Engine:

The engine shall be a 4 cycle Briggs and Stratton horizontal drive Vanguard series V-twin overhead cam air cooled gasoline engine. The engine rating shall be 23 HP at 3600 RPM with a maximum torque of 32.75 lb-ft at 2600 rpm. The engine shall have a 2.97 bore,
2.76 inches of stroke, and a displacement of 38.26 cubic inches. The engine must be capable of running at 4000 RPM's and shall meet current EPA and CARB emission standards.

The electrical system of the engine shall be 12 VDC. It shall have an electric starting system with a recoil backup. It shall also have a 16 amp regulating alternator and be pre-wired with a 3 feet engine harness to allow it to connect to a mating control harness via an 8-pin industrial sealed quick-connect connector – NO EXCEPTIONS.

The engine shall be supplied with a metal fuel tank.

Muffler:

The engine muffler system shall be dual low tone mufflers if a hand or electric primer is provided or a single vertical side mounted muffler if an exhaust primer is provided. The muffler system shall be equipped with a forestry approved spark arrestor.

Priming:

The pump shall provide the following pump priming options: a guzzler type hand primer.

The guzzler hand primer shall have a composite body with aluminum handle and reinforced buna-n diaphragm and flapper valves. It shall have a lift of 12 feet with the capability of approximately 16 feet when a foot valve is used on the pump suction hose. The hand primer shall be capable of handling a maximum pressure of 15 PSI and weigh 1.7 pounds. It shall ship loose with the unit with all the essential hardware items and hose needed to connect it to the pump up to 6 feet away.

Any priming system offered must be connected to the pump through a ¼ turn ball type shut-off valve to prevent the priming systemfrom being pressurized when the pump is attached to a pressurized water source.

The vertical belt driven speed increaser shall be a low maintenance timing belt and pulley system

The belt shall be a high quality timing belt and the drive pulley shall mount directly on the engine drive shaft through a means of a keyed tapered locking device. The increaser shall be a 1 to 1.88 ratio. In addition, a dampening device shall be provided between the pump shaft and pump shaft pulley.
Both the pump and vertical speed increaser shall be painted red.

Foam System:

Pump shall be supplied with Cascade Fire Equipment Foam-Flo 11923F

Pump Certification:
The pump, when dry, shall be capable of taking suction and discharging water in compliance with NFPA #1906. The pump shall be tested at the manufacturer's facility. The conditions of the pump test shall be as outlined and in accordance with current NFPA 1906.

The pump shall deliver the percentage of rated capacities at pressures indicated: 100% of rated capacities at 150 PSI (1000KPA) net pump pressure.

Pump Warranty:
Pump shall have a three (3) Year Pump Warranty & 72 Hour Parts Shipping. W.S. Darley & Co. guarantees to replace or repair any defective part or parts, which Darley determines to be defective in materials or workmanship from date of shipment as outlined in the Standard Pump Warranty Document, for a period of three (3) years.

INTAKE

Pump intake shall be provided with 2-1/2" (65mm) plumbing provided with a tank-pump valve and panel mounted valve with 2-1/2" chrome swivel and plug w/ chain. Valve controls shall be manual handles at valves.

- There shall be one (1) 2-1/2" (65 mm) gated intake(s) located on pump panel. Each intake shall include:
- One (1) Akron Brass 8800 series Gen II, manual type 2-1/2" (65 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.
- Each intake shall have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
  - The specified adapter shall be provided with a 2-1/2" (65 mm) NSTM chrome plated plug with chain.
- One (1) Innovative Controls model 3003000, ¾” brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on lower pump panel and drain the lowest point in the plumbing.

TANK FILL

1" (30mm) tank fill shall be provided with manual valve controlled at valve.

1" Watts valve or equivalent

- One (1) of the discharge(s) shall flow water & Foam.
- One (1) Akron Brass 8800 series Gen II, manual type 1-1/2" (38 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.
- There shall be a 1-1/2" (38 mm) NSTF x 1-1/2" (38 mm) NSTM chrome plated long adapter provided for hose bed discharge(s).

DISCHARGE REAR

Pump rear 1-1/2" (38mm) discharge shall be provided with manual valve controlled at valve with cap and chain.

- One (1) of the discharge(s) shall flow water & Foam.
- One (1) Akron Brass 8800 series Gen II, manual type 1-1/2" (38 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.
  - The specified elbow shall be provided with a 1-1/2" (38 mm) NSTF chrome plated cap with chain.

DISCHARGE FRONT

2" VALVE FONT BUMPER MONITOR EMERGENCY SHUT OFF

There shall be one (1) 2" (50 mm) gated valve discharge(s) with control located on valve. The valve shall be installed between the electric valve and the front bumper montitor discharge.

The valve shall be used in case of failure of the electric valve.

- One (1) Akron Brass 8900 series Gen II, manual type 2" (52 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) shall be controlled with a chrome handle directly connected to valve.

REMOTE CONTROL MONITOR

An Elkhart Brass Sidewinder #8494-01 electric monitor shall be provided on completed vehicle painted red. Monitor shall be constructed from durable, hard anodized, lightweight Elk-O-Lite® material with a variable cross-sectional and vaned waterway for flows up to 500 GPM. Monitor shall be constructed with thrust rods and thrust bearings on both horizontal and vertical rotational joints for improved product longevity with female 2“ NPT style inlet connection and male 1.5“ NHT or outlet connection. Unit shall have two (2) gear motors that allow for simultaneous vertical and horizontal adjustment, one motor shall control up to 334 degree horizontal rotation while the other motor shall control up to 135 degrees vertical travel (-45 degree to +90 degree vertical rotation from horizontal). Horizontal and vertical motors shall have a manual override device for use in the event of power failure. The electric control shall be compatible with both 12VDC and 24VDC power supply.

Monitor to be mounted on quick connect mount for quick removal, if necessary.

An Elkhart Brass 5000-14E, 1.5" FNH 150 GPM electric nozzle shall be provided with completed unit

A center console mounted Elkhart joystick control box shall provide user interface for proportional monitor up/down, left/right rotation, stow, horizontal and vertical automatic oscillation, nozzle control functions, and, valve control functions including required harness to electric valve. Controller shall provide the user feedback for power on, valve open position, valve closed position, and valve preset position and provide programming capability for horizontal center position, horizontal stops, stow position, block-out zones, and motor speeds fast or slow. A 30' harness shall be included for joystick to monitor control.

A Class 1 high pressure flexible hose with stainless steel Victaulic couplers shall connect the discharge valve and monitor. Hose shall be secured to body and chassis frame with bolted "P" style clamps and protected from abrasion, sharp edges, or high heat.

- One (1) of the discharge(s) shall flow water and foam.
- One (1) Elkhart Brass Unibody bronze EB series, actuated type 2" (52 mm) valve(s) with stainless steel ball, and 30' valve to joystick control harness. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
- One (1) Innovative Controls model 3003000, ¾” brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on lower pump panel and drain the lowest point in the plumbing.
- A discharge pressure gauge is not required with the remote valve control.

DISCHARGE, HOSE REEL

One (1) hose reel shall be provided located above pump with valve control at valve.

- Each booster hose reel shall be equipped with a Hannay FH-3 hose guide rollers.
- Each booster hose reel shall be supplied with 100' x 1" diameter, 800 PSI rubber booster hose with 1" NST hardcoat aluminum couplings. Color of hose shall be red.
- No nozzle is required with specified booster hose reel(s).

- One (1) of the discharge(s) shall flow water and Foam.

- One (1) Akron Brass 8800 series Gen II, manual type 1-1/2" (38 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.

  - Valve(s) shall be controlled with a chrome handle directly connected to valve.

- One (1) Class 1, 3/4" brass 90 degree ball type drain valve(s) shall be provided for the above plumbing item. There shall be a 1/4 turn control to manually open the drain valve(s) when the line is under pressure located on lower pump panel and drain the lowest point in the plumbing.

- One (1) Innovative Controls NoShok 2-1/2" liquid filled gauge(s) with red LED backlighting activated with pump engagement.

  Gauge Shall be located inside the chassis cab on the center console.

  - Gauge(s) shall have a white background with black text.

  - Gauge(s) shall have a range from 0 to 400 PSI.

  - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

POLY WATER TANK

The water tank capacity shall be approximately 300 US gallon or 249 Imperial gallons. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus.

CONSTRUCTION

The water tank shall be of a specific configuration and designed to be completely independent of the body and to incorporate the lowest possible Center of Gravity. The transverse and longitudinal baffles shall be manufactured of a minimum of 3/8" polypropylene. All baffles shall be properly vented to permit movement of air and water between compartments. All baffles shall interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. All exterior walls and interior baffles shall be welded to the floor of the tank. Tolerances in design allow for a maximum variation of 1/8” on all dimensions. All poly sheeting utilized in the construction of the tank shall be of a textured finish.

WATER FILL TOWER AND COVER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene sheet and shall have a minimum outside dimension of 8" (203mm) x 8" (203mm). The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The fill tower cover shall include a Label “WATER ONLY” that is blue in color with white letters indicating that it is a water-only fill tower. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank and shall be piped to discharge water behind the rear wheels as required

in NFPA 1901 so as too not interfere with rear tire traction. The discharge of the overflow/vent shall be threaded to allow for a fitting and hose to be installed and routed below the fuel tank or rear axle to prevent flooding.

SUMP

The sump shall be constructed of a minimum of 1/2" polypropylene. When a front suction is required, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3” above the inside floor.

THREADED PORTS

There will be three (3) standard threaded Ports: one for the tank-to-pump suction Line, one for tank fill line and a one for a water level sensor. All threads shall be of National Pipe Taper specification unless otherwise specified.

MOUNTING AND SUPPORT

The tank shall be mounted to the sub-frame of the body with a barrier of ¼” rubber between tank and any frame material. The rubber Isolator shall have a Rockwell rating of 60 durometer. The frame / cradle shall support the entire floor including the perimeter of the tank with a maximum unsupported area of 529 square inches (.341 sq m) for tanks equal to or less than 40” (1016 mm) tall and 400 square inches (.258 sq m) for tanks greater than 40” (1016 mm) tall.

WATER TANK LEVEL GAUGE

There shall be one (1) Innovative Controls SL series 10-LED water tank level gauge(s) for indicating water tank level. The tank level gauge shall indicate the liquid level on an easy to read display.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED bar graph display with a visual alarm at 1/4 of a tank. The display shall also provide an output to activate an audible alarm or secondary visual alarm at 1/4 of a tank.
- A set of weather resistant connectors to connect the digital display to the pressure transducer and to the apparatus power.

WATER TANK LEVEL INDICATOR

Water tank level indicators shall not be provided on completed unit.

POLY WATER TANK WARRANTY

The poly water tank shall be provided with a lifetime material and workmanship limited warranty. The manufacturer shall supply details of their warranty information with their bid submission.

CLASS A POLYPROPYLENE FOAM CELL

There shall be one (1) 15 US gallon or 12.4 Imperial gallon polypropylene foam cell incorporated into the polypropylene water tank. This foam tank capacity shall be deducted from water tank size specified.

There shall be one (1) pressure/vacuum vent installed on the foam tank.

A minimum 1 in. (25 mm) inside diameter full flow drain valve and piping shall be provided at the lowest point of any foam concentrate tank. The drain shall be piped to drain directly to the surface beneath the apparatus without contacting other body or chassis components. Foam cell shall be drill and tapped for foam level gauge.

A label that reads “Foam Tank Fill” shall be placed at or near the foam concentrate tank fill opening.

A label that specifies the following shall be placed at or near any foam concentrate tank fill opening:

1. Type(s) of foam concentrate the system is designed to use.
2. Any restrictions on the type of foam concentrate that can be used with the system.
3. A FAMA 19 label that reads “Warning: Do Not Mix Brands and Types of Foam”. In addition, label shall be in both English/French for units built for Canada; "*Avertissement : Ne pas mélanger les marques et les types d’émulseur".*

FOAM TANK LEVEL GAUGE

There shall be one (1) Innovative Controls SL series 10-LED foam tank level gauge(s) for indicating foam tank level. The gauge shall indicate the liquid level on an easy to read display.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED bar graph display with a visual alarm at 1/4 of a tank. The display shall also provide an output to activate an audible alarm or secondary visual alarm at 1/4 of a tank.
- A set of weather resistant connectors to connect the digital display to the pressure transducer and to the apparatus power.

CAB MOUNTED WATER TANK INDICATOR

There shall be one (1) Innovative Controls SL Mini 4-light, remote tank level gauge for indicating water level installed in cab. The tank level gauge shall indicate the liquid level or volume on an easy to read blue LED display and show increments of 1/4 of a tank.

The Mini remote gauge will receive data from the same source as the Master Display. No additional transducers shall be required.

- Above tank level display shall be located in cab interior.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1906 standards, the vehicle shall be designed for an equipment loading allowance of 500 lbs. of Taos Pueblo provided equipment based on the wildland body having at least 50 cu. ft. of storage space and under 20,000 GVWR.

EQUIPMENT

The following equipment shall be furnished with the completed wildland vehicle;

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.

- There shall be two (2) Worden HW C7Y-WH yellow handled aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20% grade, with the transmission in neutral, and the parking brake released. The wheel chocks shall have a bright yellow powder coat finish for high visibility, safety and corrosion resistance.

  - The wheel chock(s) shall be mounted on the apparatus streetside behind rear axle

- Three (3) Harrington 2.5" NST/NH x 3" Hose x 8' Flexlite PVC flexible suction hose(s) shall be provided with completed unit. The hose shall have NHM rocker lug x NHF rocker lug couplings.

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1906 for wildland vehicles, section 5.7 shall be supplied and mounted by Taos Pueblo before the unit is placed in emergency service.

Chassis shall be provided with (2) full size spare tires.