

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS

GW/SB 7-0
R. 2023-1904

AGENDA ITEM SUMMARY

Meeting Date: December 19, 2023

Consent Regular
 Workshop Public Hearing

Submitted By: Department of Airports

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to approve: Price Agreement with Rosenbauer Minnesota, LLC for the purchase and delivery of one (1) Rosenbauer Panther 6x6 High Reach Extendable Turret Aircraft Rescue and Fire Fighting (ARFF) vehicle in the amount of \$1,384,137 (Agreement) for use at Palm Beach International Airport (PBI).

Summary: Several of the vehicles utilized by Station 81, including ARFF vehicles, at PBI are nearing, or at the end of, their typical service life, resulting in increased maintenance costs and difficulty in sourcing replacement parts. The Department of Airports, in coordination with Palm Beach County Fire Rescue, has identified the need for the replacement of an existing ARFF vehicle. The first replacement ARFF vehicle of the same make and model was put in service in 2023. A plan is in place to replace vehicles that are beyond their typical service life over the next several years, which includes the purchase of a second ARFF vehicle. The procurement of the second ARFF vehicle is being processed through the Sourcewell piggy-back agreement for Firefighting Apparatus and Fire Service Vehicles awarded to Rosenbauer Minnesota, LLC, through Sourcewell Contract #113021-RSD. This purchase is exempt from the County EBO Ordinance since there are no Palm Beach County vendors that can provide this vehicle. Pursuant to changes to Chapter 332, Florida Statutes, effective July 1, 2023, a governing body of a commercial service airport may not approve contracts in excess of \$1,000,000, on a consent agenda. This purchase exceeds the threshold amount and must be approved on the regular agenda. Countywide (AH)

Background and Policy Issues: In order to meet the requirements of 14 CFR Part 139, the purchase of this vehicle is necessary to provide redundancy to the current fleet of rescue vehicles available for response at PBI. Station 81 is the primary response facility for all incidents and accidents that occur at PBI. Minimum ARFF vehicle requirements for commercial service airports are established by Title 14 Code of Federal Regulations (CFR) Part 139. ARFF vehicles are specialized fire trucks that respond to aircraft incidents, which must be capable of extinguishing fires involving jet fuel and responding to an incident within three minutes. ARFF vehicles normally have a 10-12 year service life.

Attachments:

- 1. Agreements (2)
- 2. Specifications

Recommended By: Laura Buba 11/27/23
Department Director Date

Approved By: W. Baker 12/13/23
County Administrator Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2024	2025	2026	2027	2028
Capital Expenditures	\$1,384,137				
Operating Costs					
External Revenues (Grants)					
Program Income (County)					
In-Kind Match (County)					
NET FISCAL IMPACT	\$1,384,137				

ADDITIONAL FTE
POSITIONS (Cumulative)

Is Item Included in Current Budget? Yes X No _____
 Does this item include the use of federal funds? Yes _____ No X
 Does this item include the use of state funds? Yes _____ No X

Budget Account No: Fund 4110 Department 121 Unit A032 Object 6401
 Reporting Category _____

B. Recommended Sources of Funds/Summary of Fiscal Impact:

Funds are available in the above referenced account for this purchase.

C. Departmental Fiscal Review: Webb Jensen 11/27/23 Uva 11/27

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Development and Control Comments:

Lisa M. [Signature] 11/29/23
 OFMB 11/29 Edw 11-28-2023

J. S. [Signature] 12/6/23
 Contract Dev. and Control 12/6/23

B. Legal Sufficiency:

Anne Helgent 12-7-23
 Assistant County Attorney

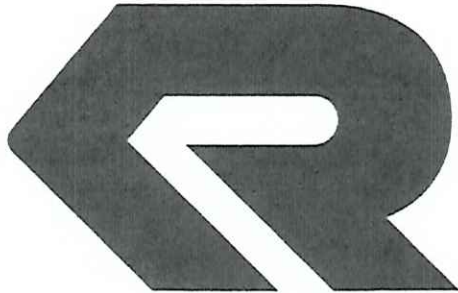
C. Other Department Review:

[Signature]
 Department Director

REVISED 11/17

(THIS SUMMARY IS NOT TO BE USED AS A BASIS FOR PAYMENT)

***Rosenbauer Class 5 ARFF Vehicle
Panther 6x6 with HRET***



SPECIFICATION PREPARED FOR

**Palm Beach
International Airport**

***PANTHER 6x6 3000 GALLON
WITH HIGH REACH EXTENDABLE TURRET***

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DEFINITIONS

The intent of these specifications is to describe the requirements necessary to supply a well-designed, self-contained, properly engineered diesel-powered Aircraft Rescue and Fire Fighting (ARFF) vehicle. The unit shall be new and unused.

The ARFF vehicle shall consist of a crew cab on a 6x6, custom chassis with single tires. It is to be all-wheel drive, single engine diesel-powered, with an automatic transmission.

The fire-fighting package shall include a water tank with a minimum capacity of 3000 gallons (11,356 liters) and a liquid foam agent concentrate tank with a working capacity sufficient for two tank loads of water at the maximum tolerance specified in NFPA 414.

The unit shall contain all component parts necessary for a water/foam proportioning system capable of expelling agent through a cab-controlled High Reach Extendable Turret (HRET), a bumper turret, gated discharge(s), twin agent hand line and pre-connected handline(s) as detailed hereafter in these specifications.

The vehicle shall also be equipped with an auxiliary agent system. The system shall be operable from the cab and exterior of the vehicle.

Discharges shall meet all current applicable discharge rate requirements of FAA Advisory Circular #150-5220-10E and NFPA 414 standards in effect at time of bid.

This apparatus shall be equipped with various other components as called for in these specifications.

During the construction of the vehicle, Rosenbauer reserves the right to make running production changes if the changes enhance the safety, operation and maintenance of the vehicle.

USB STORAGE

For ease of service the chassis shall come with an on-board USB flash drive. The flash drive shall have a minimum of 8 GB of storage capacity; and shall be located in the dash panel.

The following items shall be stored on the Flash Drive.

- As built wiring diagrams
- Chassis, body and HRET manuals when applicable.

The USB shall be accessible through a USB-A to USB-B cable

FAMILIARIZATION GUIDE

Rosenbauer shall provide a customized printed hard copy familiarization guide for each fire personnel specific to the purchaser's vehicle which will include the following:

- Safety Information
- Vehicle Information
- Familiarization Vehicle External Components
- Driver Cab Controls – Overview
- Transmission
- Center Console Controls
- Pump system
- Auxiliary agent System
- Electrical System
- Preparations for use
- Starting Procedures
- Pre-Start Checks, Jacking, Trailing, & Roll Up Door Maintenance

WATER FOAM AGENT APPLICATORS

Per the FAA circular and NFPA 414

Each water/foam agent handline shall be capable of delivering a finished foam solution that meets the applicable rate, range, and pattern standards of Table 4, Performance Parameters 3 or 4.

Each water/foam agent handline shall deliver finished foam of a quality that meets the applicable standards of Table 4.

Each water/foam agent turret shall be capable of delivering a finished foam solution that meets the applicable rate, range, and pattern standards of Table 4, Performance Parameters 5 or 6, as applicable.

Each water/foam agent turret shall deliver a finished foam of a quality that meets the applicable standards of Table 4.

All water/foam applicator performance requirements are based on the assumption that foam used to perform the tests is an approved foam concentrate; e.g., will pass the military AFFF foam specification 50 ft² fire test and the burn back resistance test.

QUALITY ASSURANCE

Rosenbauer will fully comply with all items regarding quality assurance, test and technical service and training as defined in NFPA 414.

DELIVERY

The completed vehicle shall be delivered by flatbed truck to a location designated by the customer. After delivery, Rosenbauer shall supply a qualified technician to inspect the vehicle, perform any final adjustments to the vehicle and make the vehicle ready for service.

VEHICLE FAMILIARIZATION

Rosenbauer shall provide a qualified technician after delivery and acceptance by the purchaser acquaint fire department personnel in the proper use and application of the ARFF unit as necessary to accommodate staffing

Familiarization for fire fighters shall consist of the following:

- Classroom instruction on proper operation and maintenance of this ARFF vehicle to include visual inspection of vehicle, indicating various controls and instruction in proper operation of the unit.
- Actual operation/driving of the ARFF vehicle to include instructions in proper driving of the vehicle, foam and water discharge, pump operation, and familiarity with all necessary firefighting functions.
- Familiarization will include the use of computer aided programs, manuals and hands-on familiarization.
- Rosenbauer will provide familiarization for department maintenance personnel on the vehicles major systems and lubrication points.

BASE VEHICLE WARRANTY

Rosenbauer shall provide a one (1) year bumper to bumper warranty on the vehicle.

A warranty statement shall be provided that will include the following as a minimum:

- Manufacturer's obligations
- Duration of warranty period for vehicle, engine, transmission, and water/foam tanks
- Warranty procedure
- Disclaimers

Rosenbauer shall support the vehicle with factory trained technicians to perform warranty repairs during the warranty period.

ENGINE WARRANTY

The engine shall be covered by a total of five (5) years or 4000 hour warranty, whichever occurs first. Warranty details shall be provided with the bid submission.

TRANSMISSION WARRANTY

The transmission shall be covered by a five (5) year warranty. Warranty details shall be provided with the bid submission.

WATER PUMP WARRANTY

The water pump shall be covered by a five (5) year warranty. Warranty details shall be provided with the bid submission.

WATER TANK WARRANTY

The water tank shall be covered by a lifetime warranty. Warranty details shall be provided with the bid submission.

PAINT WARRANTY

A five (5) year paint warranty shall be provided for all portions of the apparatus that have been painted. Warranty details shall be provided with the bid submission.

FINAL INSPECTION TRIP

A final inspection of the completed vehicle at the manufacturer's facility shall be provided at no cost to the purchaser. The final inspection trip shall include associated airfare, meals and lodging expenses for purchaser representatives. The visit shall include a final vehicle acceptance inspection.

FACTORY MAINTENANCE TRAINING

Rosenbauer shall provide factory maintenance training for one (1) individual of the purchaser's choice at the Rosenbauer – Minnesota Division assembly facility located in Wyoming, MN to acquaint vehicle maintenance personnel in the proper maintenance and operation of the Rosenbauer ARFF vehicle. The course shall be a minimum of four (4) consecutive days in duration.

Each participant who successfully attends the training will receive a certificate.

The course shall include intensive instruction in the following:

- Vehicle Operation.
- Logic and schematics of air, electrical, hydraulic and agent systems.
- Checks.
- Maintenance.
- Troubleshooting.
- Vehicle Component Construction.
- Disassembly and Repair.

All airfare, tuition, books, meals and lodging shall be included.

VEHICLE TESTING

The vehicle shall be tested in accordance with NFPA 414 and FAA 5220-10E. A final report of the vehicle testing, and certification shall be provided to the end user for their records.

Unit shall comply with all requirements of FAA Advisory Circular #150-5220-10E and NFPA 414 standards in effect at time of bid.

PAINTING

The vehicle will be painted/striped in accordance with the FAA AC and shall include the following:

A coating of epoxy sealer shall be applied with a minimum of 1.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of Urethane Paint Direct Gloss with Catalyst shall be applied with a minimum of 2.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking.

The vehicle will be painted/striped in accordance with the FAA AC and shall include the following:

Cab: per the FAA specification (lime yellow)

Frame: black

Superstructure: FAA specification (lime yellow)

Front angle of approach: Combination black and FAA (lime yellow)

A coating of epoxy sealer shall be applied with a minimum of 1.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of Urethane Paint Direct Gloss with Catalyst shall be applied with a minimum of 2.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking.

UNDERCOATING

The wheel well areas of the cab and body shall be sprayed with an automotive undercoating.

WHEEL PAINT

The chassis wheels shall be painted black in color.

LETTERING

Single color reflective lettering and numerals shall be applied per customer direction and sized appropriately to the vehicle design as space allows. Lettering details shall be discussed and designed during pre-construction.

The customer shall provide to the manufacturer the approved airport/ARFF department emblem for installation by the manufacturer's graphic specialists. The manufacturer shall advise the customer when the graphics should be delivered to them for installation so there is no delay in prepping the apparatus for final inspection/delivery.

ROOF NUMBER

An unpainted aluminum plate shall be provided on the roof of the cab for placement of the vehicle identification number and shall also serve as the mount for radio antenna's if required.

The identification number shall be reflective, and color shall be determined by the Customer.

REAR IDENTIFICATION NUMBER

A painted aluminum plate shall be provided on the rear face of the engine mod for placement of the vehicle identification number.

The identification number shall be reflective and color shall be determined by the Customer.

STRIPING

An 8" reflective stripe shall be applied to the perimeter of the vehicle to meet the requirements as outlined in the FAA Advisory Circular #150-5220-10E. Striping information shall be discussed and designed during pre-construction.

REAR CHEVRON

The rear of the body shall have an NFPA approved chevron style reflective material applied after the body has been painted. The chevron colors shall be installed on the outside edge of the engine mod in a red/amber reflective color scheme.

BOOM EXTENSION MARKINGS

The inside fly of the boom shall be provided with numbers visible to the operator indicating extension distance.

PERFORMANCE

The design objective for the vehicle and the fire extinguishing system shall be performance in accordance with FAA Advisory Circular.

Rosenbauer shall provide a data plate.

This data plate shall be installed in the cab of the vehicle and visible to the operator.

Acceleration from 0-50 mph
(0-80 kph): Less than 35 seconds

Top speed: Approximately 70 mph (112 kph)

Braking from 60-0 mph
(96-0 kph): Less than 235 feet (71.5 meters)

Side Slope Stability: 30° (58% grade)

Pump & Roll Discharge
On Slope: 21.8° (40%)

Steering Max Cramp Stability: 12° (20%)

Dynamic Balance: 22 mph (min)

Pump performance: Up to 2100 GPM (8000 LPM)

ENVIRONMENTAL

The vehicle shall be capable of withstanding the following conditions without detrimental effect to subsequent operation of the vehicle or any of the fire extinguishing systems:

- a) Dust particles, as encountered in desert areas.
- b) The corrosive effects of salt fog.
- c) Material decay from fungus and mildew.
- d) Relative humidity up to 100 percent, as well as wind driven snow, sleet, rain, and vehicle self-splashing of water.

GRADABILITY

The vehicle shall be able to ascend a 50-percent grade in its fully loaded condition.

OPERATIONAL RANGE

The fully loaded vehicle shall be able to:

Operate continuously for 30 miles (48 km) at speeds up to 55 mph (88 kph). The test route shall include agricultural lands, paved and unpaved roads, and grades typical of those encountered at the airport.

Negotiate pooled water to a depth of 2 inches (50 mm) for a distance of at least 150 feet (45 meters) at a speed of at least 40 mph (65 kph) without engine flooding/stalling, loss of directional control, loss of braking, or electrical system(s) shorting.

Operate for 10 minutes on dry, paved roadway at not more than 2 mph (3.2 kph) at an engine speed that does not result in rough, irregular operation.

Ascend a dry, paved incline having an 8- percent grade for a distance of 0.25 mile (0.4 km) at a speed of not less than 20 mph (32 kph).

Negotiate (J Turn) a 90°, 150-foot (45 meter) radius turn at 30 mph (48 kph) on smooth, dry, level pavement without loss of directional control or stability.

TOP SPEED

The vehicle shall be able to consistently reach a top speed of 70 mph (112 kph) and maintain a constant speed of at least 60 mph (96 kph) on typical paved, level (grades of less than 1 percent) highway surfaces for a minimum distance of 20 miles (32 km) without showing overheat symptoms in any portion of the cooling system or power train.

FLEXIBILITY

The design objective for the vehicle frame, suspension, and mounting of major components shall be to provide the capability for diagonally opposite wheel motion up to 14 inches (355 mm) above the ground without raising the remaining wheels from the ground or causing interference or parts failure. The vehicle is designed in such a way as to exceed this requirement. The upper motion of the vehicle suspension is such that it will travel a minimum of 7 inches (177 millimeters) in an upward fashion and exceed the lower travel limit of seven inches in such a way to maintain tractability and prevent "hanging" of the suspension when conditions exceed this parameter.

MAINTAINABILITY

The vehicle design shall be such that it:

Uses the fewest number of different parts consistent with the specified performance.

Permits maintenance with commercially available, general purpose mechanic tools and equipment. Rosenbauer shall provide and document in the maintenance manual introduction any special or nonstandard tools required, and any unique test equipment required to perform operator/owner maintenance and service.

Limits the number of tools and the variety of spare parts required for maintenance by such design practices as reducing the variety of bolt sizes, light bulb sizes, wire gauges, tubing, and pipe sizes as consistent with safety and performance requirements.

The vehicle shall utilize disconnect plugs, receptacles, junction boxes, bus bars, multiple-line connectors in the electrical systems, and readily detachable fittings in hydraulic and pneumatic systems, as applicable. All disconnect points shall be clearly labeled. All hydraulic and pneumatic lines and electrical wires shall be color, function, or number coded.

As applicable pilots, guides, slides, carriages, or other features shall be utilized if it adds to the ease of removal and installation or attachment of components.

The vehicle shall use a fastener system that is easily disassembled and reassembled for all cabinets and bodywork that must be removed for access for maintenance and removal of components for repair or replacement. Uses fasteners not limited to brackets, nuts, bolts, washers, screws, and rivets of stainless steel or other materials resistant to corrosion.

Locates drains, filler plugs, grease fittings, hydraulic line-bleeders, and checkpoints so that they are readily accessible and do not require special tools for proper servicing.

The vehicle shall be designed and constructed so that the installation of each major subsystem or critical part can only be in its proper operating position.

Provides accessible connections, where needed, to attach troubleshooting, analytical, and diagnostic equipment to appropriate vehicle subsystems.

Operates with standard commercial lubricants. Grease and oil seals shall be of a design and located to provide accessibility for inspection, servicing, and replacement. Access to lubrication points shall be provided by means of an easy opening door or hinged panel. Lubrication fittings shall be located in accessible, protected positions. Parts or assemblies that are not readily accessible for direct lubrication or are likely to be overlooked because of inaccessibility shall have extended fittings. A safety chain shall attach filler caps to lubrication fill points where practical.

CONTINUOUS DUTY LUBRICATION SYSTEM

A centralized continuous duty lubrication system shall be installed to lubricate the chassis.

COMPONENT PROTECTION

All oil, hydraulic, air, water, foam concentrate, and electrical system conduits, tubing, and hoses shall be located in protected positions. They shall be secured to the frame or body structure and, except where a through-frame connector is necessary, shall be fitted with protective looms or grommets at each point where these items pass through panels or structural members.

All radiator grills, louvers, lamps, tie rods, drive shafts, piping, and other vulnerable components shall be protected by component location or by guards adequate to prevent damage from brush, stones, logs, or any other debris likely to be encountered by the vehicle during off road performance.

BALANCE AND CLEARANCES

The weight shall be distributed as equally as practical over the axles and tires of the fully laden vehicle. The difference in tire load between tires on any axle shall not exceed 5 percent of the average tire load for that axle. The difference in load between axles shall not exceed 10 percent of the load on the heaviest axle. The front axle shall not be the most heavily loaded axle.

The fully loaded vehicle shall be able to meet the side slope stability performance requirements specified in FAA Advisory Circular.

Approach angle:	30°
Departure angle:	30°
Inter axle clearance angle:	12°
Side slope stability:	30°
Under body clearance:	25" (635 mm)
Under axle clearance:	Axles: 14.75" (374 mm)

DIMENSIONS

The overall height, length, and width of the vehicle shall be the smallest dimensions consistent with the rated payload for its class and the operational performance requirements of the vehicle.

Overall length:	approx. 39' 4" (12,000 mm)
Overall width:	approx. 11' (3,352 mm) including mirrors
Overall height:	approx. 12' 1" (3,683 mm) to top of guard rails
Wheel base:	18' 3" (5,600 mm)

LOAD RATING

The functional load rating of the frame shall equal or exceed the actual gross vehicle weight (GVW). The GVW includes complete chassis; cab with attachments, accessories, and equipment; the body with rated agent payload, including a full complement of crew, fuel, lubricant, coolant, firefighter protective clothing, equipment, and breathing apparatus in appropriate numbers; and fire-fighting hand tools and appliances.

Weight ratings:

Front axle:	28,500 lbs / 12,927 kg
1 st Rear axle:	28,500 lbs / 12,927 kg
2 nd Rear axle:	28,500 lbs / 12,927 kg
Total:	85,500 lbs / 38,781 kg

EMISSIONS RATING

The engine shall be Tier IV final emission ratio certified.

ENGINE

A high-performance diesel engine with electronically controlled fuel injection system and modern, fuel efficient 4-cyle design as follows:

Make/Model:	VOLVO D16 High performance diesel engine with electronically controlled fuel injection system
No. of cylinders:	6, in line
Aspiration:	turbocharger, charge air cooling, 4-cycle
Engine output:	700 HP (515 kW) at 1,800 rpm
Maximum torque:	2,323 ft. lbs. (3,150 Nm) at 1,200 rpm
Displacement:	16.1 liters

ENGINE BRAKE

A Volvo engine brake shall be provided for assisted braking. The engine braking system shall be activated by releasing the throttle pedal.

The brake system can be deactivated by pressing an ON/OFF switch located on the dashboard.

COOLING SYSTEM

Type:	Water-ethylene/glycol cooling
Performance:	System shall have the capability to stabilize the vehicles engine temperature within the limits specified by the engine manufacturer under all operational conditions encountered by the vehicle.
Construction:	Heavy duty type, bolted construction modular design that includes the transmission oil cooler, remote mounted, semitransparent reservoir tank for easy fill access, reservoir is visible from an access door at rear side of vehicle. Drain cocks shall be provided on the low points of the system to aid in draining the system completely if needed.

Air flow: Thermostatically clutch controlled pusher fan shall provide fresh air to the radiator by means of an air duct. Air is ingested through the top of the vehicle and exhausted out the rear. Hot air from the engine compartment is never directed across the radiator cooling fins and provides excellent engine temperature control.

Hoses and Connectors: All hoses associated with the coolant system (radiator and heater) shall be made of a silicone material and shall be secured with constant torque clamps.

COOLING SYSTEM

The cooling system shall be rated for -40 to 110F (-40 to 43C)

HIGH IDLE SWITCH

An engine high idle switch shall be supplied and shall maintain the engine idle at approximately 1200 rpm when engaged. The switch will be tied to activate only when the transmission is placed in neutral and the park brake is set.

FUEL SYSTEM

**Primary Fuel Filter/
Water separator:** One (1) thermostatically controlled heated fuel/water separator

Secondary Fuel Filter: One (1) filter element

FUEL RE-PRIME

A Fuel re-prime switch and electric in-line aux fuel pump shall be supplied to prevent loss of prime to the engine and aid in the replacement of fuel filters during routine maintenance.

FUEL TANK

Capacity: One (1) nominal 80-gallon fuel tank shall be supplied. The fuel tank supplied meets the performance requirements as outlined in NFPA 414 which states that the vehicle fuel tank shall have sufficient capacity to provide for a minimum of 30 miles of highway travel at 55 mph average plus 2 hours of pumping at the full-rated discharge. Additional fuel capacity shall be provided for a minimum of four (4) hours of operation of each accessory item (such as a generator or fuel-fired heater(s) that uses the common fuel tank as a source.

Location: Mid-ship on right side.

EXHAUST SYSTEM

The vehicle will be supplied with a stainless-steel pipe and muffler. The muffler shall be mounted on top of engine compartment. The exhaust is terminated in such a way as to minimize noise on the interior and exterior of the vehicle.

EXHAUST TERMINATION

The exhaust shall terminate vertically that directs all exhaust away from the vehicle.

TRANSMISSION

A single source transmission system, consisting of power divider, torque converter, and six-speed automatic power shift transmission with integrated transfer case shall be provided to ensure perfect matching of these components. A single supplier allows easy service support for these major drive train components.

The main transmission is remotely mounted in the center of the chassis, low in the frame rails. The low mounting position while still providing excellent ground clearance allows for a lower center of gravity, thus increasing the dynamic stability of the vehicle.

The input section of the transmission consists of two gear-driven clutch shafts. Each shaft contains two (2) 7" (177 mm) clutch packs of the orifice type. When the clutch is engaged, output is from gear and drive rings on the clutch shafts and through gears on the compound shaft. This shaft contains two 9" (228 mm) clutch packs equipped with individual feedback dump valves. The front 9" (228 mm) clutch is an LD type clutch and the rear is an S type clutch. A spline-connected output gear on the 9" (228 mm) clutch shaft is meshed with the input gear on the inter-axle differential. The differential includes two independent output shafts connected through the inter-axle differential. The differential has a clutch that when applied, locks up the differential providing a solid drive through the differential to the outputs.

Manufacturer: Twin Disc 6-speed fully automatic powershift transmission.

SUSPENSION

The axles and suspension system shall be such that the total un-sprung weight of the vehicle will not be greater than 20 percent of the in-service GVW.

Double-acting hydraulic shock absorbers shall be provided for all axles or bogies, as applicable.

Energy absorbing stops shall be installed so as to prevent damage to axles, drive shafts, the engine oil pan, or any other portions of the chassis from bottoming.

The vehicle utilizes a high-performance coil spring system (HPCSS). A variable rate coil spring in combination with a 4 link V-rod / trailing rod system w/ anti-roll bar over live rigid axle provides superior off/on road capabilities that comply with all current regulations including FAA, NFPA and ICAO. The system incorporates a high-performance variable rate coil spring and dual acting shock absorber mounted on each wheel. The live rigid axle provides strength and is tied to a torsion bar and

V-link rod allowing the rigid axle to move in an independent manner. Each wheel will be supplied with an energy absorbing bump stops to prevent the suspension from contacting the chassis. The system allows for a minimum of 16 inches of wheel travel with lower wheel travel exceeding all applicable standards to prevent the wheel from “carrying” in asymmetrical travel conditions. Wheel travel and tractability exceed all applicable standards. The HPCSS system shall provide ride capabilities that reduce road shock, protect the body and mounted components from damage and provide the operator positive feedback to during extreme vehicle maneuvering.

The progressive coil spring over live rigid axle system has by design a lower roll moment than a half shaft driven independent suspension system and provides positive control in on road / high speed cornering situations and provides a safe controllable ride in off road conditions. The suspension system combines the best features of independent coil spring suspensions and rigid axle systems, allows for independent movement of the wheels, and has a minimum of moving parts, extreme strength and weight carrying capacity.

Because of the arrangement of the 4-link suspension the vehicle rear tandems have a natural cramp built in the axle assembly allowing “trailing” of the rear axle behind the intermediate axle with a natural cramp of approximately 2 degrees. This allows for decrease tire wear and reduced turning clearance without the need for expensive and maintenance intensive “steering” axles.

The suspension system is fully tested and is NFPA/FAA/ICAO compliant and meets all current requirements for an Off-Road High Mobility Suspension System.

Front Suspension

Manufacturer: Rosenbauer Motors
Type: High Mobility On/Off Road Coil Spring Live Rigid Axle Suspension
Design: Variable rate coil spring suspension with heavy duty double acting shock absorbers, V-rod links, torsion bars and anti-roll stabilizer bar.

Rear Suspension

Manufacturer: Rosenbauer Motors
Type: High Mobility On/Off Road Coil Spring Live Rigid Axle Suspension
Design: Variable rate coil spring suspension with heavy duty double acting shock absorbers, live rigid axle, V-rod links, torsion bars and anti-roll stabilizer bar.

WHEELS AND TIRE ASSEMBLY

Single tires for optimal off-road performance are provided on all axles. The tires have high mobility non-directional tread. All tires are interchangeable without restrictions.

Front Wheels

Wheel type: Bolted steel wheel
Wheel size: 18.00 x 21
Tire type: High mobility tires
Tire size: 24R x 21
Wheels and tires are interchangeable with rear axle.

Rear Wheels

Wheel type: Bolted steel wheel

Wheel size: 18.00 x 21

Tire type: High mobility tires

Tire size: 24R x 21

Wheels and tires are interchangeable with front axle

TIRES

The tires provided shall be Michelin brand for optimal off-road performance on all axles.

SPARE WHEEL and TIRE ASSEMBLY

One (1) spare wheel and tire assembly interchangeable with front or rear axle shall be provided.

MUD FLAPS

Mud Flaps shall be installed behind each wheel well to reduce damage from stones, brush etc. being thrown off the tires.

TIRE PRESSURE MONITORING SYSTEM

A tire pressure monitoring system shall be provided which monitors the pressure of each individual wheel with a digital read out located in the cab.

TOW EYES & SHACKLES

Two tow eyes shall be provided at the front and at the rear of the frame with a shackle for each tow eye.

BRAKE SYSTEM

A pneumatically actuated brake system shall be provided that has been tested and certified. The system shall include an all-wheel, split-circuit, power-assisted service brake, a modulation capable emergency brake and parking brake.

The braking system meets or exceeds FAA, NFPA, ICAO and the Federal Motor Vehicle Standard (FMVSS) 121 requirements. An ABS braking system is provided as standard for improved safety. The brakes are directly mounted to hub and wheel. In case of a major drive shaft failure, the vehicle can still be stopped safely.

SERVICE BRAKES

Type: Dual circuit brake system w/ABS meeting FMVSS 121, NFPA 414 and FAA Advisory Circular 150-5220-10E. ABS system shall include a self-diagnostic system and warning indicator on the cab dash instrument cluster to advise the driver of operation or malfunction.

Actuation: Floor mounted treadle foot valve for service brake. Dash mounted push-pull valve for parking brake.

Compressor: Capacity 37 cfm direct drive engine mounted

Miscellaneous: Push-lock color coded nylon tube throughout routed along chassis frame rail; air tanks equipped with heated automatic drain valves; air compressor discharge line stainless/ Teflon; reservoir capacity approx. 80 l (4,950 in³); air dryer w/heated element (Bendix ADIP).

Rapid Buildup: A fast build up system is provided to permit release of spring brakes within 15 seconds of engine start up based on empty air tanks.

External Air Tank drains: Provisions for draining the air tanks from a centralized remote point on the vehicle shall be provided eliminating the need for a person to go under the vehicle. The drain points shall be labeled.

Performance: Exceeds FAA, NFPA, ICAO and FMVSS requirements

20 - 0 mph (32-0 kph) in less than 40 ft. (12 m) Requirement is 40 ft. (12 m)

40 - 0 mph (64-0 kph) in less than 160 ft. (48 m) Requirement is 160 ft. (48 m)

Holding Capacity: Min. 60% slope

Notes: The pneumatically operated firefighting functions are supplied from a separate dedicated, pressure protected accessory reservoir.

FRONT AND REAR BRAKES

Front Brakes

Type: Wedge-Type Drum Brakes

Rear Brakes

Type: Wedge-Type Drum Brakes

AXLES

The axles shall be rated and certified as being suited for the intended use. The axle manufacturer's approved rating shall not be raised to conform to the requirements of this specification.

Front and rear axles shall have adequate capacity to carry the fully loaded vehicle under all intended operating conditions. The maximum variation in axle tread shall not exceed 20 percent of the tire(s) sectional width at rated load.

Tractive power at each wheel shall be achieved by use of torque proportioning differentials or other suitable automatic devices that will ensure that each wheel of the vehicle is driven independently of the other wheels.

Front axles shall be equipped with steering drive ends designed to eliminate fluctuations in angular velocity of the wheels when cramped either left or right at all normal operating speeds.

An all-wheel drive axle system is provided. The well proven design is widely used in commercial and military applications. An extensive testing cycle applied to pre series vehicles ensures reliability and longevity in this specific ARFF application.

The usage of torque increasing planetary hub ends reduces the size of the differential housings and improves the ground clearance for extensive off-road operation.

Front Axle

Make: Kessler

Type: The front axle is of the front driving/steer type with suitable reduction gearing via planetary gears at the hubs. A driver operated differential lock is provided.

Front Brakes

Type: duplex wedge type drum brakes

1st Rear Axle:

Make: Kessler

Type: Double reduction with suitable reduction gearing via planetary gears at the hubs. Driver operated differential locks and an inter-axle lock on the first rear axle are provided.

Rear Brakes

Type: simplex wedge type drum brakes

Rear Axle:

Make: Kessler

Type: Double reduction with suitable reduction gearing via planetary gears at the hubs. Driver operated differential locks and an inter-axle lock on the first rear axle are provided.

Rear Brakes

Type: simplex wedge type drum brakes

PARKING BRAKE

Type: Spring apply, pneumatically activated release
Location: At rear axles, two (2) chambers per axle. Parking brake warning light indicator on cab dashboard.
Holding Capacity: Min. 30 % slope

ROLL STABILITY CONTROL

A roll stability control system shall be provided to reduce the chance of vehicle roll over. Upon sensing of vehicle instability, the engine rpm's shall automatically reduce and the brakes shall activate until parameters are met and the vehicle is once again stable.

STEERING

The power assisted steering shall have sufficient capacity so no more than 15 pounds (6.8 kg) pull is necessary on the steering wheel rim to turn the vehicle wheels from lock to lock of the fully loaded vehicle when stationary.

The design of the steering mechanism shall permit manual steering to bring the fully loaded vehicle to a safe stop after power-assist failure.

The vehicle shall perform as follows when driven on a steering pad around a 100-foot (30 m) radius circle:

- (1) With increasing speed, the steering angle shall increase; over steer shall not be acceptable.
- (2) The vehicle shall remain on the prescribed path until achieving a speed at least equal to the standard specified in Table 2, Performance Parameter

The wall-to-wall turning diameter shall be no greater than three times the length of the vehicle.

A tilt/telescoping steering wheel/column shall be provided.

Ram assisted power steering system is provided.

Steering Column: Tilt-telescoping

Steering Wheel: 18" (457 mm) Four Spoke w/ integrated horn button.

STEERING POSITION

The steering column and wheel shall be mounted left center of the cab.

COACH WORK

The Rosenbauer Panorama Safety Cab certified per the latest regulations including NFPA 414, FAA Advisory circular 150-5229-10E as well as ICAO and using ECE R29-3 and was tested with a real crash test to ensure cab safety.

Parts shall be fabricated from materials that will provide the lightest weight consistent with the needs for strength, as well as heat and corrosion resistance. Safety of the crew shall be a primary consideration in coach work, especially the protection of occupants during a roll over.

A fully trimmed ROSENBAUER Panther ARFF two door cab providing forward left center driving position shall be provided. The cab is constructed of welded aluminum box sections with formed aluminum sheets. Large windows provide excellent all around and upward visibility through tinted safety glass and tempered side windows. Heavy duty light alloy extrusions provide front impact protection as well as a roll cage to protect the occupants.

A panorama-view windshield, in combination with full glass side walls as well as the compact dashboard, provide an excellent range of vision, including from the rear crew seats. The roof window offers a perfect view to the roof turret.

The windshield is made of laminated safety glass, side and roof windows are made of tempered safety glass.

The cab entrance is built with a low positioned outside step, integrated steps and wide opening doors that allow for safe access and offers more space for equipment in the cab with an additional compartment integrated in the step.

Access to the roof turret through a roof hatch is possible by using the rear wall mounted steps. Gas springs support the opening of the hatch and keep it in safe position even in windy conditions.

CAB DOORS

Large safety doors are provided on both sides. The doors open 90° to provide maximum safety for crew members entering and exiting with SCBA. In addition, a true staircase, not a ladder type entry shall be provided.

RBI Cab Door Arrestor System

CAB DOOR ELECTRIC WINDOWS

The cab door sliding windows shall be electrically actuated. Window controls shall be mounted on the center dash and accessible for operation by both front crew members (driver and turret operator).

BUMPER

A heavy-duty bumper is provided to protect the lower cab section and provide an integrated mounting provision for the bumper turret.

ROOF ACCESS / EMERGENCY EXIT PROVISION

A marine quality roof hatch shall be provided for roof access and as an emergency exit provision should such an exit be required.

A stair/ladder shall be provided for access to the cab roof.

WINDSHIELD WIPERS

Three (3) wipers with jet washers are provided including a reservoir. The reservoir fill cap is easily visible and accessible.

AUTOMOTIVE WINDOW TINT

The front windshield and side windows of the cab shall be provided with standard automotive window tint.

SOLAR CONTROL FILM

Solar control film shall be applied to the vehicle cab glass to reduce the solar radiation that directly passes through the glass.

WINDSHIELD DELUGE SYSTEM

A Windshield Deluge system shall be furnished and installed on the chassis cab. The windshield deluge system shall have four (4) nozzles mounted above the windshield and have a separate pump assembly with activation switch in the cab. Minimum pump output shall be three (3) gallons per minute (11 liters per minute). The windshield deluge system shall be plumbed to direct clear water onto the windshield. The system shall be provided with a screen to prevent debris from rendering any nozzles or the pump inoperable.

INSULATION AND WATERPROOFING

Insulation shall be fire and water resistant and of a type that will not pack or settle. Provision shall be made to allow the drainage of water from between the walls by gravity flow. The average heat loss shall not exceed 0.24 BTU/ft² (0.76 W/m²) per degree Fahrenheit per hour. All insulation that could be exposed to abrasion or damage from equipment storage or operator activities shall be provided with a protective covering. All insulation that will be located on the exterior of the vehicle shall be protected from damage or exposure by a permanent cover to be constructed to match the vehicle exterior.

All components shall be designed, installed and/or protected so that their normal function will not be impaired by heavy rains, road splash, formation of condensation, or the spillage of extinguishing agents from nozzles and fittings, recharging operations, or leaks in the piping system.

The vehicle shall incorporate the use of air conditioning and the system shall meet current automotive/truck and environmental protection standards for vehicle air conditioning. The air conditioning system shall not change the acceptable pass/fail criteria for any of the performance tests of the vehicle or the firefighting system.

INTERIOR CAB EQUIPMENT

A low floor and a wide door on each side of the cab to allow rapid entry and exit shall be provided. The ergonomically laid out instrument panel is equipped with a full set of instruments, weatherproof illuminated switches and a complete warning system with indicator lights and audible alarms. All substantial firefighting functions including the turret controls are within reach of driver and co-driver on a center console.

- Heavy duty non-slip flooring shall be provided in the forward portion of the cab.
- Instrument panel, with integral dash mounted controls.

- Heater/defroster; fresh air and re-circulating type, outlets spread evenly across the dash.
- One (1) grab handle at each cab door for entry assistance.
- Windshield shall be one-piece, high visibility and shatter-proof laminated safety glass.
- Roof viewing window.

CUP HOLDERS

Cup holders shall be provided and mounted for each seated position.

SUN VISORS

Interior sunshades shall be installed on the upper portion of the cab windshield and roof window.

POWER POINT

One (1) dual USB 12-volt power point shall be provided and incorporated in the dash console.

One (1) 12-volt power point shall be provided and incorporated in the dash console.

MAP LIGHTS

Two (2) Goose neck style map lights shall be provided and mounted one (1) each side of the cab dash.

IN CAB FLASHLIGHTS

Two (2) Streamlight LED Lite Boxes yellow in color shall be provided and installed one (1) each side front of the cab.

MIRRORS

Large, heated, four-way power adjustable and remotely operated mirrors shall be mounted on the front of the cab, providing excellent visibility. Mirrors shall provide a minimum of 60 square inches (38,709 square mm) viewing and incorporate a wide-angle convex mirror. The mirror controls shall be located on the right side for ease of use by the driver.

CREW SPACE

All crew space shall be restricted to the interior of a fully enclosed cab with approved, 3-point restraints.

Where practicable, instruments shall be used in preference to warning lights. If warning lights are used, a means to readily test the condition of all warning light bulbs shall be provided.

Instruments and warning lights shall be displayed so that they will be useful, convenient, and visible to the driver.

The instrument panel(s) shall either be easily removable as units or hinged for back access. Quick disconnect fittings shall be used for all electrical connections to the instrument panel. All instruments, except liquid filled gauges, shall be illuminated. Labels for control and instruments shall be backlit or illuminated.

All rotating or reciprocating parts, all parts with operating temperatures above 120° F (49° C), or that are electrically energized or are of such a nature or so located as to be a hazard to the safety of operating and maintenance personnel during their normal duties, shall be insulated, enclosed, or guarded as appropriate for the specific hazard and its location.

All space that is occupied or from which work is performed during operations, servicing, and maintenance of the vehicles shall be free from hazardous protrusions, sharp edges, cracks, or other elements that might reasonably be expected to cause injury to personnel.

RIDE QUALITY

The vehicle shall be designed so that the ride quality permits the safe operation of the vehicle in on/off road conditions and in adverse terrain that may be encountered on the airfield. If the vehicle is used in an off-road environment the vehicle shall be capable of traveling at speeds up to 35 mph (56 kph) without causing injury to the operating personnel who are properly seat belted in the vehicle and without causing damage to the vehicle itself.

CONTROLS

All the controls necessary for the full operation of the vehicle and for activating the firefighting system shall be within reach of the driver.

Controls for the fire extinguishing system(s) shall also be within easy reach of a second crew station. All cab-mounted controls shall be identified by function and/or limitation with permanent backlit labels.

Firefighting equipment and controls located on the vehicle exterior shall be placed between 24 inches (609 mm) and 72 inches (1,828 mm) above the ground, catwalks, or deck plates, as applicable.

All controls located on the exterior of the vehicle shall be labeled with an illuminated permanent label identifying function and/or limitation.

SIREN/PUBLIC ADDRESS SYSTEM

A multi-tone, multi-volume emergency vehicle warning siren/public address device with speaker and microphone shall be installed. The device shall produce a minimum sound level of 95 dB(A) at 100 feet (30m) directly in front of the vehicle and 90 dB(A) at 100 feet (30m) and 45 degrees left and right of front center.

One (1) siren speaker shall be mounted on the front bumper or the turret mounting platform and shall be protected from firefighting agent dripping from the bumper turret and water splashed up by the tires.

SIREN SWITCHES

Siren activating foot switches shall be provided for the driver and turret operator.

BACK-UP ALARM

A "vehicle backing" warning device, audible up to 25 feet (7.6 m) behind the vehicle, shall be provided. Shifting the transmission into reverse shall activate the back-up alarm.

AIR HORN SYSTEM

Two (2) Air horns shall be provided and mounted to achieve optimum sound projection to the front of the vehicle.

One (1) floor mounted foot switch shall be provided on each side floor of the cab for the driver and front passenger crew seat.

RADIO EQUIPMENT

Provide and install an Icom A-120 radio and install a customer provided Motorola radio. Provide and Install a Setcom 1350 wired headset system with a headset location for the driver and turret operator positions. Include PTT foot pedal for driver.

NOTE: The radios quoted above have been provided to meet the Customers bid specifications/addendums. Any radios requiring additional options or options not listed in the Customer bid specification/addendums such as software, trunking or encryption packages shall be an additional cost.

ANTENNA TAPS

The vehicle will be provided with three (3) separate 30 amp circuits with breakers and connections provided in a space adjacent to the driver and turret operator for the installation of Customer provided and installed radios and other communication equipment after the vehicle is delivered to the end user. To facilitate the installation of the communication equipment, three (3) antenna taps shall be provided and installed on top of the cab with cabling run to the center console for the Customer installed radios.

The vehicle shall be provided with radio interference protection in accordance with SAE J551/4, Test Limits and Methods of Measurement of Radio Disturbance Characteristics of Vehicles and Devices, Broadband and Narrowband, 150kHz to 1000MHz, or an equivalent radio interference suppression standard.

REMOTE START

A remote start button shall be provided on the left side exterior of the cab to remotely start the vehicle engine.

INSTRUMENTATION DISPLAY

The vehicle dash cluster instrumentation shall be standard psi.

INFORMATION

- Speedometer (electronic)
- Tachometer (electronic)
- Transmission mode (N / active gear / R)
- Odometer
- Transmission oil temperature
- Coolant temperature
- Dual air pressure (indication and warning)
- Differential locks activated
- Fuel level
- Ad-blue level
- Voltmeter
- Indicator left/right
- Lights (low beam / high beam, fog lights, rear fog lights)
- Engine brake
- Indicator speed
- Indicator pressure
- Indicator temperature

WARNINGS

- Engine oil pressure low
- Coolant temperature high
- Coolant level low
- Transmission oil temperature high
- Park brake engaged
- Fuel level low
- Exhaust system
- Engine check/stop
- ABS deactivated

Warning Sign that states "Occupants must be seated and wearing a seat belt when apparatus is in motion" will be provided in locations that are visible from each seated position in accordance with NFPA 414.

CONTROL PANEL FOR FIRE FIGHTING OPERATION

Control of the firefighting system is done via LCS 2.0 control display within a well-designed menu navigation. All necessary control elements appear as a button in the relevant submenu. A status-LED in combination with the information in the display shows active buttons.

The following buttons are always provided at the display:

- Optical alarm devices
- Acoustic alarm devices
- Pump operation
- Pump operation / manual operation
- Foam operation
- Scene lighting
- Warnings
- System information

Additional service screens in the display contain detailed information regarding engine, gearbox and superstructure.

Activation and deactivation of the fire pump (automatic mode) as well as engine speed adjustment is done via LCS-Digipot (display screen). Pressing the "Start"-button activates an automatic mode (Pump and Roll) with following functions:

- Activation of PTO of torque converter
- Increase engine speed
- Open water tank suction valve
- Engage priming pump (if specified)
- Engine speed is infinitely variable via turn switch.

INSTRUMENTATION DISPLAY

The pump panel digital instrumentation shall be standard psi.

TRIPLE AGENT CONTROL PANEL

Activation of propellant for dry chemical powder and Halotron shall be via a safety switch in cab accessible by both the driver and passenger. One (1) pressure gauge will be mounted in the cab, displaying the vessel pressure of the dry chemical system.

INTERIOR CABINETS

There shall be two (2) interior storage cabinets located one (1) on the floor of the back center portion of the cab and one (1) located under the interior access ladder, both compartments shall be provided with lift up doors with thumb latches.

EMS CABINET W/ ROLL-UP DOOR

There shall be a forward-facing EMS cabinet installed on the rear wall of the cab. The cabinet shall be constructed of smooth aluminum plate with two (2) adjustable shelves and one (1) LED light. The cabinet shall be equipped with a roll-up door constructed of anodized aluminum.

AIR CONDITIONING

An air conditioning system shall be installed in the cab. The evaporator shall be integrally installed with the heater/defroster unit.

DASH MOUNTED FANS

Two (2) 24-volt fans with protective shrouds shall be provided and mounted one (1) each side of the dash for additional air circulation and additional windshield defogging.

DRIVER'S SEAT

One (1) high back with recline air ride driver's seat, covered in grey Dura-Wear material and integrated seat belt system shall be installed. The integrated seat belt shall be red in color to provide contrast.

TURRET OPERATOR'S SEAT

One (1) high back adjustable (fore, aft, up & down) turret operator's seat covered in grey Dura-Wear material and integrated seat belt system shall be installed. The integrated seat belt shall be red in color to provide contrast.

LEFT SIDE CREW SEAT

One (1) high back adjustable fixed position fire-fighter flip up crew seat with integrated Load and Lock SCBA bracket, covered in grey Dura-Wear material and integrated seat belt system shall be installed to the left and slightly aft of the driver's position and shall egress directly out the left cab door. The integrated seat belt shall be red in color to provide contrast.

A removable insert to cover the SCBA unit when mounted in seat back shall be supplied.

RIGHT SIDE CREW SEAT

One (1) high back adjustable fixed position fire-fighter flip up crew seat with integrated Load and Lock SCBA bracket, covered in grey Dura-Wear material and integrated seat belt system shall be installed to the right and slightly aft of the driver's position and shall egress directly out the right cab door. The integrated seat belt shall be red in color to provide contrast.

A removable insert to cover the SCBA unit when mounted in seat back shall be supplied.

FLIP UP VIDEO MONITOR

A flip up monitor shall be provided on the driver's side of the cab dash for viewing of the FLIR image.

A flip up monitor shall be provided on the officer's side of the cab dash for viewing of the FLIR image.

COLOR CAMERA – CAB MOUNT

A Color Camera with zoom capabilities shall be installed to provide enhanced visibility for low light or smoky conditions. Cold Start to video image shall be 30 seconds or less. A wide-angle field of view shall be provided approximately 36° horizontal x 27° vertical. The camera shall be capable to operate in open ambient air temperatures from -40°F to 122°F (-40°C to 50°C).

The color camera shall be attached to the turret operator's side A-pillar via a stationary, fixed mount. The color camera system shall be capable of operation as an observation aid during vehicle operations.

A 10.4" (264 mm) LCD 1042x768 resolution flat screen monitor shall be provided for the color camera. The viewing angle shall be 45° or more. The monitor case shall be durable aluminum construction capable of mounting on cab dash. This monitor shall be used to display the FLIR camera images and/or color camera images as specified elsewhere in these specifications.

CAMERA LOCATION

The color camera shall be mounted to the HRET pierce tip.

360 DEGREE CAMERA SYSTEM

A color camera system shall be provided allowing 360 degree viewing around the vehicle aiding in safety for personnel working around the vehicle.

The view shall be from the center dash mounted LCS monitor.

CAMERA SELECTION DEVICE

A Camera Selection Device shall be installed allowing the user to select either the FLIR camera image or the color camera image on the video monitor. If a DVR (Digital Video Recorder) is specified, the DVR shall continue to record all camera images regardless of which camera image is currently being displayed on the video monitor.

DIGITAL VIDEO RECORDER (DVR)

A Digital Video Recorder (DVR) shall be installed to record FLIR camera images and color camera images simultaneously.

MONITORING AND DATA ACQUISITION SYSTEM (MADAS)

A Rosenbauer MADAS system shall be installed on the vehicle that will allow the monitoring of the following items as specified in the NFPA 414. Installed components from the DWD system must be integrated:

- vehicle speed
- vehicle heading
- lateral acceleration
- vertical acceleration
- longitudinal acceleration and deceleration
- engine RPM
- throttle Position
- steering Input
- vehicle braking input (pedal position and brake pressure)
- date, time, and location for all data collected

The GPS position of the truck shall be stored by the system in addition.

The data acquisition system shall be capable of storing the measurements and the time intervals, starting at least 120 seconds before and ending at least 15 seconds after any serious incident. The system shall be designed so that the data being recorded will not be lost or overwritten immediately after the incident due to the use of an emergency shut-off or a master electrical disconnect switch. System shall be "hot-wired" to the battery system and shall by-pass the normal electrical system. Appropriate software cables and instruments necessary to download and interpret the data shall be provided.

LATERAL ACCELERATION INDICATOR

A Rosenbauer Driver Warning Device (DWD) shall be installed providing an in-cab vehicle operator training device inclusive of a lateral acceleration sensor and driver awareness/alarm system. The system shall provide both visual and audio warning signals to the driver as specified in the NFPA 414 and FAA Advisory Circular 150/5220-10.

The system shall provide the ability to set an alarm threshold for the vehicle. The alarm includes an advisory light at each 10% of the threshold with a color change and audio alert up from 70% of the level.

The DWD system shall have at least the following technical ratings:

- wide range DC input from 9 to 30V
- IP65 rating or higher
- Operating temperature from -4°F to +158°F
- TFT visualization display of 3"

PUMP COMPARTMENT

The pump compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm²) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

COMPARTMENT WEIGHT LABELS

All compartments shall be supplied a highly visible, permanently affixed label clearly stating the maximum weight that can be placed in the compartment based upon tilt table certification testing.

DRIVERS SIDE UNDERTANK COMPARTMENT

The undertank compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm²) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

PASSENGER SIDE UNDERTANK COMPARTMENT

The undertank compartment shall be well ventilated and weatherproof.

Vents with a total of at least 10 squares inches (64.5 cm²) of ventilation shall be supplied where required.

Drains to allow collected water to run out under the vehicle shall be provided.

The floor of the compartment shall be lined with PVC matting (turtle tile) where applicable.

ROLL-UP COMPARTMENT DOORS

Primary access to vehicle compartments on the vehicle shall be via doors of a rollup design. Doors shall be aluminum rollup non-locking type with a bar latch mechanism to open/close the door. Secondary access to some vehicle storage areas will utilize a hinged panel door design.

SCBA/EXTINGUISHER COMPARTMENTS

Two (2) SCBA exterior storage compartments shall be provided and located one (1) each side between the rear tandem axles. Each compartment shall hold two (2) SCBA bottles and one (1) fire extinguisher in separate protected tubes. The compartments shall be provided with a horizontally hinged, lift-up painted door with thumb latches and shall utilize a hold-open device.

REAR ACCESS LADDER

The rear face engine mod shall be provided with a ladder to access the top of the vehicle. The ladder shall be painted grey in color with the lower portion foldable for increased vehicle angle of departure.

FIXED SHELVING

One (1) fixed shelf shall be provided and mounted on each side of the engine mod compartment.

OPEN COMPARTMENT DOOR WARNING SYSTEM

There shall be an indicator light mounted on the cab dash which will be highly visible during the day or night. This indicator light shall be wired to an audible signal to advise the operator when a compartment door is open. This warning indicator light shall be interlocked with the vehicle's parking brake and shall operate whenever the parking brake is released.

HANDRAILS/GUARDRAILS

Handrails and guardrails shall be provided for personnel safety at all steps and walkways including along the top of the vehicle. The rail material shall be heat and corrosion-resistant and shall be provided with a low-maintenance, durable, and sunlight, weather, heat, and corrosion resistant finish.

STEPS, AND WALKWAYS

All step surfaces, ladder rungs, walkways, and catwalks shall be anti-skid. Anti-skid deck plating shall be provided on the top of the vehicle.

The height between steps shall be less than 20 inches (508 mm). The lower steps shall be 22 inches (558 mm) or less from the ground in the loaded condition. The tread of the bottom steps shall be at least 8 inches (203 mm) in width and succeeding steps at least 16 inches (406 mm) in width. The full width of all steps shall have at least 6 inches (152 mm) of unobstructed toe room or depth when measured from and perpendicular to the front edge of the weight-bearing surface of the step.

FIRE PUMP

The ROSENBAUER N80 fire pump meets and exceeds the stringent requirements of NFPA and is listed by Underwriters Laboratories (UL).

Make:	ROSENBAUER
Model:	N80
Material:	High strength corrosion resistant light alloy impeller and housing. Pump shaft to be stainless steel. Pump is mechanically sealed.
Drive:	By power divider
Rated capacity:	2100 gpm @ 220 psi (15 bar) tank suction operation
Number of stages:	1
Location:	In pump compartment. Pump is mounted lower than the water tank to assure gravity priming. A priming pump is supplied as standard to assist pump priming if needed
Suction line to tank:	Pneumatic actuated butterfly valve
Automatic Overheat Protection:	The pump shall be equipped with an automatic overheat protection device to prevent the pump from overheating when running the pump without discharging water (dead heading). The automatic overheat system shall monitor the water temperature inside the pump and automatically open a valve to discharge water and cool the pump. The overheat

protection system will automatically reset after the water temperature has reached normal operating temperature. A visual water pump overheat indicator shall be provided in the cab.

PRIMING DEVICE

The fire pump is equipped with a ROSENBAUER KAP priming device as a standard. This allows to air evacuate the piping system quickly and also provides excellent drafting capabilities. The priming device is capable of automatic operation if the water pump requires it or can be manually operated if needed. Controls are provided in the cab and on the structural panel for manual operation.

Make:	ROSENBAUER
Model:	KAP
Type:	High speed, double piston priming pump,
Actuation:	Automatic and Manual
Drive:	Via tooth belt from main pump shaft
Suction performance:	Up to 24 ft. (7.3 m), attainable vacuum up to 96%

HEAVY GAUGE CORROSION RESISTANT STEEL PIPING

All pipe work is manufactured from heavy-gauge, corrosion resistant, hot dip galvanized steel pipe and tubing to minimize corrosion. Each pipe is pressure tested prior to assembly and the complete system is pressure tested during pumping tests.

MAIN SUCTION INLET

One (1) 5" (125 mm) gated suction inlet on the left side with 5" (125 mm) shall be installed.

A drain for bleeding air and water from the lines shall be installed.

ADAPTER

A 5" storz adapter with cap shall be provided.

LEFT SIDE DIRECT TANK FILL

One (1) 4" gated tank fill shall be provided located within the left side of the pump module next to the main pump intake with 4" (100 mm).

ADAPTER

A 5" storz x 2 1/2" nst (f) adapter with plug shall be provided.

RIGHT SIDE DIRECT TANK FILL

One (1) 4" gated tank fill shall be provided located within the right side of the pump module with 4" (100 mm).

ADAPTER

A 5" storz x 2 1/2" nst (f) adapter with plug shall be provided.

LEFT SIDE DISCHARGE

One (1) 2 1/2" (65 mm) NSTM discharge shall be installed on the left side.

The discharge shall be equipped with a 2 1/2" (65 mm) NST 30° elbow.

The discharge shall be equipped with a 2 1/2" (65 mm) NST cap.

The discharge shall be equipped with a liquid filled 2 1/2" (65 mm) gauge installed adjacent to the discharge or discharge control.

A drain for bleeding air and water from the lines shall be installed.

Foam metering for this discharge shall be provided by the Fix Mix around the pump foam proportioner.

RIGHT SIDE DISCHARGE

One (1) 2 1/2" (65 mm) NSTM discharge shall be installed on the right side.

The discharge shall be equipped with a 2 1/2" (65 mm) NST 30° elbow.

The discharge shall be equipped with a 2 1/2" (65 mm) NST cap.

The discharge shall be equipped with a liquid filled 2 1/2" (65 mm) gauge installed adjacent to the discharge or discharge control.

A drain for bleeding air and water from the lines shall be installed.

Foam metering for this discharge shall be provided by the Fix Mix around the pump foam proportioner.

LEFT SIDE PRE-CONNECTED SOFT JACKET HANDLINE

One (1) quick attack, pre-connected soft jacketed handline shall be provided.

The handline shall be installed on the left side of the vehicle in an enclosed compartment for easy access.

The handline will be equipped with an "auto-charge" device that will allow a single firefighter to safely deploy the handline without needing to return to the vehicle to charge the handline.

Pre-connected handline shall be capable of flowing a minimum of 95 gpm (359 lpm) per NFPA 414 utilizing 200' (60 m) of 1 3/4" hose.

NOZZLE

The handline shall be equipped with an adjustable gallonage pistol grip nozzle with NST thread.

HOSE

200 ft (60 m) of 1 3/4" rubber-lined, soft, double-jacketed hose with NST thread shall be supplied with the vehicle in 50-foot (15 m) lengths.

PRE-CONNECT MOUNTING

The pre-connect handline shall be mounted on a slide out tray complete with Turtle tile to allow drainage.

RIGHT SIDE PRE-CONNECTED SOFT JACKET HANDLINE

One (1) quick attack, pre-connected soft jacketed handline shall be provided.

The handline shall be installed on the right side of the vehicle in an enclosed compartment for easy access.

The handline will be equipped with an "auto-charge" device that will allow a single firefighter to safely deploy the handline without needing to return to the vehicle to charge the handline.

Pre-connected handline shall be capable of flowing a minimum of 95 gpm (359 lpm) per NFPA 414 utilizing 200' (60 m) of 1 3/4" hose.

NOZZLE

The handline shall be equipped with an adjustable gallonage pistol grip nozzle with NST thread.

HOSE

200 ft (60 m) of 1 3/4" rubber-lined, soft, double-jacketed hose with NST thread shall be supplied with the vehicle in 50-foot (15 m) lengths.

PRE-CONNECT MOUNTING

The pre-connect handline shall be mounted on a slide out tray complete with Turtle tile to allow drainage.

STRUCTURAL CONTROL PANEL

A structural package is standard on all Rosenbauer vehicles. The fully operational structural panel is located on the left-hand side of the vehicle and shall be mounted in the vehicle pump compartment and shall be provided with:

- a) Switch for water tank suction valve
- b) Switch for foam tank suction valve
- c) Switch for foam proportioning rate
- d) Electronic discharge pressure gauge (Pressure Governor System)
- e) Electronic intake pressure / vacuum gauge (Pressure Governor System)
- f) Indicator lamp for water tank suction valve open
- g) Indicator lamp for foam tank suction valve open
- h) Indicator lamp for priming pump operating
- i) High water temperature warning light
- j) Low oil pressure warning light
- k) Control lamp for PTO
- l) Switch for flushing
- m) Switch for priming pump
- n) Electronic Pressure Governor Control System with the following:
 - OK to Pump indicator
 - Electronic tachometer
 - Electronic Intake Pressure Gauge
 - Electronic Discharge Pressure Gauge
 - Idle button
 - Preset pressure
 - Engine Coolant Temperature Gauge
 - Engine Oil Pressure gauge

PSI PUMP PANEL GAUGES

The discharge gauges and pressure governor control system (PSG) shall read in PSI.

BUMPER TURRET

A Rosenbauer RM35 multi-position, high volume, low attack (HVLA) bumper turret with an automatic water/foam nozzle shall be provided. The turret will include the following features:

NOZZLE SWEEP ASSEMBLY

The nozzle sweep assembly shall consist of a double swivel joint allowing the nozzle to sweep in both horizontal and vertical planes. Internal turning vanes shall be cast into the assembly for more efficient flow. The elevation axis shall allow the nozzle to be elevated 90° or depressed 45° either side of center for a 135° vertical sweep (plus 180° rotation to park position).

The horizontal axis rotation shall allow the nozzle to be directed either side of center for up to 180° sweep. Both horizontal and vertical drive motors shall be electric with current limiting motor protection.

NOZZLE

The nozzle shall have an automatic flow mechanism that maintains consistent pressure and includes a self-draining baffle mechanism with a water/foam dual flow range calibrated to primary turret flow requirements specified by NFPA 414 – latest edition. The nozzle must maintain a constant flow throughout the flow range in straight stream through wide fog patterns.

The nozzle shall be a non-air aspirating type with electric pattern actuation to select straight stream or dispersed pattern discharge. The nozzle shall meet or exceed the straight stream distance and pattern spray as specified by NFPA 414 – latest edition.

The nozzle shall be equipped with an automatic leveling device that will keep the nozzle parallel to the ground regardless of boom position.

MULTI-FUNCTION CONTROLS

A multi-function remote nozzle control with auto-oscillation shall be provided, joystick type. The controller shall have dual axis motion plus soft touch switches for discharge functions. Left and right motion shall control horizontal sweep. Forward and back motion shall control vertical sweep.

Joystick switch functions shall include the following operations:

Switches

Water/Foam Discharge “ON” and “OFF”

“FOG/STRAIGHT STREAM” selection

Auxiliary Agent Discharge “ON” and “OFF”

Boom “UP and DOWN” function

“HIGH/LOW” Flow selection

Highly visible indicators shall be provided for High/Low flow position and nozzle Auto-Level “ON”. These indicators shall be positioned so that they can be seen by the operator while keeping his eyes focused on the nozzle discharge.

BOOM DESIGN

The nozzle assembly shall be attached to a boom mechanism made of heavy wall stainless steel for long life and corrosion resistance. The nozzle and mounting assembly shall be adequately reinforced to sustain all anticipated loads and reaction force of the volume nozzle.

The boom mechanism shall be capable of lowering the nozzle to near ground level or elevating the nozzle to 30° above horizontal. Boom “UP” and “DOWN” positioning shall be by momentary switches on the joystick control handle.

The boom and nozzle shall be capable of folding up and into a PARK position to provide minimum protrusion from the front of the vehicle and maximum driver visibility. This position shall also maintain the 30° angle of approach.

The boom shall move by means of an electric-hydraulic pump and hydraulic cylinder. The lift system shall be self-contained and connect directly to the chassis electrical system. Holding valves shall be installed to prevent boom drift when the hydraulic system is turned off.

DRY CHEMICAL NOZZLE

The bumper turret shall be provided with a Rosenbauer Chem Core dry chemical nozzle meeting the requirements set forth in NFPA 414.

TURRET LIGHT

One (1) High Intensity (LED) light shall be attached to the nozzle assembly. Lights shall rotate and elevate with nozzle movement to provide illumination of the water/foam stream.

PIERCING TOOL DISTANCE SENSOR

The HRET piercing tool shall be provided with a Rosenbauer piercing tool distance sensor (DS) which allows the operator to monitor the distance between the fuselage and the pierce tip providing optimization for piercing effectiveness.

The system shall feature a red in color laser measuring range of 3.5 inches to 14.7 feet and shall automatically activate when in pierce tip mode.

UNDER-TRUCK NOZZLES

For ground fire control system, four (4) under-truck nozzles are fitted on the vehicle. The water/foam under-truck nozzles shall be provided so that the combined spray pattern will cover the total under-truck as well as the inner sides of the wheels and tires.

Discharge: Approximately 19 gpm (72 lpm) each

Pattern: Conical dispersed

Control: Switch on dashboard inside the cab.

WATER TANK

Construction: Heavy-Duty polypropylene

Baffle plates: Longitudinal, horizontal plus transversal. Baffling is provided to compartmentalize the tank minimizing "sloshing" of the tank in less than full conditions allowing for increased vehicle stability.

Fill Tower: Quick Opening Lid

Overflow Vent: Provided

Tank drain: 2" (50.8 mm) actuation from the side of the vehicle terminating 1 1/2" storz.

Tank sump: Of sufficient size to minimize swirl.

Design features: Structural integrity to withstand internal and external loads.

Best utilization of space for keeping vehicle's dimensions compact, and center of gravity as low as possible.

Excellent strength to weight ratio.

The water tank assembly shall be directly attached to the chassis with flexible rubber-steel elements. Bending and torsion loads transmitted from the vehicle frame are absorbed in those rubber steel elements.

The tank is mounted with stress isolating rubber cone bearings on the chassis frame rails. It provides optimum weight distribution on the axles assuring the required soft soil mobility and maximum traction for cross-country travel.

Non-slip walkway is fitted on top of the vehicle on all walkways.

TANK CAPACITIES

The water tank capacity shall 3,000 gallons and the foam tank capacity shall be 400 gallons.

The foam concentrate tank shall have a working capacity sufficient for two tank loads of water at the maximum tolerance specified in NFPA 412.

EXTERIOR LED WATER TANK LEVEL INDICATOR

Two (2) exterior, highly visible LED style water tank level indicators shall be installed high on the side of the vehicle. There shall be one (1) tank level indicator mounted on each side.

FIRE EXTINGUISHING SYSTEM - FOAM CONCENTRATE SYSTEM

A fully automatic ROSENBAUER foam admixing system is provided. The system is completely pre-calibrated at the factory during the initial test procedure. A test report shall be provided. The metering rate can be changed during operation of the foam system without interruption or recalibration by operating a switch in the cab or on the exterior pump panel.

Depending on the rate of discharge (GPM) from the water pump, the check valve in the control unit is activated and transfer rods adjust the metering valve to deliver foam concentrate to the eductor on the intake side of the water pump.

The metering valve regulates the exact quantity of foam concentrate to be added. During all stages of operation, a non-return valve in the foam concentrate suction line prevents water from entering the foam concentrate tank.

The system is designed for use of protein and synthetic foam concentrates as well as AFFF.

In addition to the foam main line from the foam tank there is an outside source connection, which can be used to draft foam concentrate from a container, directly into the proportioning system bypassing and preserving the onboard foam tank if needed.

Foam concentrate metering is fully automatic. The system induces a pre-selected percentage of concentrate constantly depending on the GPM flowed through the discharge side of the water pump. Change in agent discharge and agent pressures will not affect the pre-selected percentage on proportioning.

If the vehicle is re-circulating water back to the tank and the foam system is activated, the recirculation valve automatically closes to prevent foam concentrate from entering the water tank.

A system flushing mode is provided in order to clean foam concentrate from the firefighting piping system by means of inducing clean water downstream of the foam tank suction valve and discharging through the monitor or other discharge lines. An interlock system is incorporated to ensure that the flushing valve is in the closed position when the main foam valve is open.

The ROSENBAUER FIX MIX works fully mechanically, is maintenance-free, requires no adjustment to the system and does not make use of any electronic or electric components for unmatched reliability.

FIRE EXTINGUISHING SYSTEM - FOAM CONCENTRATE SYSTEM

An electronically regulated, fully automatic ROSENBAUER foam admixing system shall be provided. The system is completely pre-calibrated at the factory during the initial test procedure. A test report shall be provided upon delivery of the completed vehicle. The foam metering rate shall be able to be changed during operation of the foam system without interruption or recalibration by operating a switch in the cab or on the exterior pump panel.

Manufacturer: ROSENBAUER

Model: FIXMIX 2.0 E

Type: Around-the-Pump Automatic Foam Proportioner (electronically regulated, mechanically pre-controlled) with selectable variable rate proportioning (1%, 3%, 6%)

Foam delivery: 1.3 – 132 gpm (5-500 lpm)

Usability: For all types of Class B - foam concentrate including AFFF

Admixing rate: Between 0% and 6% adjustable

Standard setup: 1%, 3% and 6% Usability: for all foam compounds with a viscosity up to 60 cSt (foam compounds with higher viscosity available on request)

The water cone in the pump discharge opens according to the rate of discharge (GPM) from the water pump. A potentiometer measures the movement of the cone and calculates the water flow. The cone is connected with a rod to the foam dosing disc, that meters the foam according to the water

flow. In addition, a bushing with an opening will be turned by an electric motor according to the chosen proportioning rate. The foam concentrate is then delivered to the eductor on the intake side of the water pump. The foam flow is constantly controlled by a magnetic inductive flow meter in the foam suction line. If there is an offset, the electric motor will be adjusted accordingly. The system is pre-adjusted by the water cone and will be fine-tuned with the electronic controls.

During all stages of operation, a non-return valve in the foam concentrate suction line prevents water from entering the foam concentrate tank.

The system is designed for use of protein and synthetic foam concentrates as well as AFFF.

In addition to the foam main line from the foam tank there is an outside source connection, which can be used to draft foam concentrate from a container, directly into the proportioning system bypassing and preserving the onboard foam tank if needed.

Foam concentrate metering is fully automatic. The system induces a pre-selected percentage of concentrate constantly, depending on the GPM flowed through the discharge side of the water pump. Change in agent discharge and agent pressures will not affect the pre-selected percentage on proportioning.

If the vehicle is re-circulating water back to the tank and the foam system is activated, the recirculation valve automatically closes to prevent foam concentrate from entering the water tank.

A system flushing mode shall be provided in order to clean foam concentrate from the firefighting piping system by means of inducing clean water downstream of the foam tank suction valve and discharging through the monitor or other discharge lines. An interlock system is incorporated to ensure that the flushing valve is in the closed position when the main foam valve is open.

The ROSENBAUER FIXMIX 2.0E works mechanically with electronic control and is maintenance-free and requires no adjustment to the system.

During foam operation the water and foam flow will be shown in the main display.

ON BOARD FOAM TESTING SYSTEM

Manufacturer: ROSENBAUER

Model: Foam Test System

Requirement: FIXMIX 2.0 E

In lieu of using foam concentrate, the FIXMIX 2.0 E will be operated with water. The pump/foam system shall be plumbed to allow foam testing via a switch located in the cab L operation panel.

The system measures the water flow and the simulated foam flow (with water) when discharging through an outlet.

The two flows and the proportioning rate will be displayed on the LCS monitor located in the cab. With this option it is possible to check the system without using foam.

FOAM DRAFT CONNECTION

A foam draft connection terminating in 1 1/2" storz shall be provided on the left side of the vehicle for the drafting of foam to the Fix Mix foam system from an external source.

FOAM FILL/DRAIN

One (1) 1 1/2" (38 mm) storz fill connection with manually operated ball valve and internal strainer shall be located on each side of the vehicle.

110 VAC FOAM TRANSFER PUMP

A 110-VAC electrically operated foam transfer pump shall be supplied for the loading and off-loading of AFFF foam concentrate. The pump shall be supplied with 1 1/2" [38mm] Storz connections.

The pump assembly shall be portable and be supplied with a vehicle type mounting bracket in a compartment.

The pump shall have a 3' three prong household type electrical plug and have an on/off switch located on the pump.

There shall be two and clear spiral wire reinforced hoses supplied to allow transfer from bulk barrel containers to the vehicle foam tank.

The suction hose shall have a 1 1/2" [38mm] connection on one end and be open on the opposite end for insertion into a foam container. The suction hose shall be 84" long.

The discharge hose shall have two 1 1/2" [38mm] connections and be 48" long.

EXTERIOR LED FOAM TANK LEVEL INDICATOR

Two (2) exterior, highly visible LED style foam tank level indicators shall be installed high on the side of the vehicle. There shall be one (1) tank level indicator mounted on each side.

FOAM CONCENTRATE

The foam provided shall be 3% AFFF Mil-spec.

FOAM CONTAINER

((2)) 275-gallon totes of flourine free foam shall be provided with the vehicle.

DRY CHEMICAL SYSTEM

A Fire Combat 500 lb. (225 kg) Dry Chemical system shall be furnished and installed on the vehicle complete with nitrogen cylinder(s), dry chemical reservoir, and all necessary plumbing components. Controls for the charging of the dry chemical system shall be located in the cab and shall incorporate gauges to indicate nitrogen vessel storage pressure and system charged pressure. Blow-down and re-servicing valves shall be supplied and incorporated in the system plumbing. A fill opening shall be supplied on the top of the vehicle allowing the dry chemical reservoir to be filled without the need to remove any piping or accessory.

A nameplate, clearly indicating Blow-down and Re-servicing instructions shall be mounted in the compartment adjacent to the system.

NITROGEN BOTTLE

One (1) nitrogen cylinder with internal pressure gauge shall be mounted on the vehicle.

DRY CHEMICAL AGENT

((10)) 50-pound (22 kilograms) containers of Chem-Guard Purple K potassium based dry chemical shall be provided with the vehicle.

HALOTRON SYSTEM

A Fire Combat 460 lb. Halotron 1 system shall be furnished and installed on the vehicle complete with argon cylinder(s) and Halotron reservoir and all necessary plumbing components. The argon cylinder shall be mounted on the vehicle and shall allow for servicing by a single firefighter standing on the ground. Controls for the charging of the Halotron system shall be located in the cab and shall incorporate gauges to indicate argon vessel storage pressure and system charged pressure. Blow-down and re-servicing valves shall be supplied and incorporated in the system plumbing.

ARGON BOTTLE

One (1) Argon cylinder with internal pressure gauge shall be mounted on the vehicle.

HALOTRON AGENT

((460)) pounds of Halotron agent shall be provided with the vehicle.
Shipping/Storage container for Halotron

SPARE CHARGING CYLINDER

One (1) spare argon cylinder shall be supplied and shipped loose with the vehicle.

SWING OUT HOSE REEL

The reel shall be mounted on a swing-out bracket system in a compartment on the left side of the vehicle to allow deployment of hose to the front of the vehicle.

HOSE REEL

A single agent hose reel shall be provided and mounted in a compartment on the left side of the vehicle.

The reel shall be supplied with a DC electric rewind and controls for the charging of the dry chemical system shall be located at the reel.

HALOTRON DISCHARGE

The reel shall be plumbed with Halotron.

BOOSTER HOSE

The reel shall have a capacity of 150' of "single agent" 1" rubber "booster" type hose for Halotron use.

HALOTRON NOZZLE

The Halotron hose reel discharge shall be supplied with a nozzle designed for Halotron use.

FIXED HOSE REEL

The reel shall be fix mounted in a compartment on the right side of the vehicle.

HOSE REEL

A single agent hose reel shall be provided and mounted in a compartment on the vehicle.

The reel shall be supplied with a DC electric rewind and controls for the charging of the auxilliary agent system shall be located at the reel.

DRY CHEMICAL DISCHARGE

The reel shall be plumbed with dry chemical.

BOOSTER HOSE

The reel shall have a capacity of 150' of "single agent" 1" rubber "booster" type hose for dry chemical use.

DRY CHEMICAL NOZZLE

The dry chemical hose reel discharge shall be supplied with a dry chemical nozzle.

PROPELLANT CYLINDER LIFTING SYSTEM

An AC 120 volt electric winch system shall be provided to assist in installation and change of the agent propellant cylinders. The lift system shall meet the intent of FAA and NFPA guidelines whereas to allow for servicing by one (1) person standing from ground level.

CHASSIS ELECTRICAL SYSTEM

Starter:	24 Volt DC starting
Chassis lighting	24 Volt DC lighting
Maintenance Switch:	A battery disconnect-isolator switch is provided and shall be mounted near the batteries. The switch will prevent starting of the vehicle during maintenance and will be wired so as to not interrupt the major power supply to the vehicle's starter.
Remote voltmeter:	A remote voltmeter energized by a switch shall be provided adjacent to the auto eject shoreline.

ALTERNATOR

A high capacity 24-volt 150-amp alternator shall be provided meeting FAA 5220-10E and NFPA 414. The alternator shall include warning light in the cab to indicate alternator failure.

BATTERY SYSTEM

Two (2) 12-volt maintenance-free AGM type batteries with frame rail mounted carrier on left rear side of vehicle wired in series 24 volt. The system shall have sufficient cold cranking battery capacity that meets the engine manufacturer's recommendation for the lowest ambient starting temperature.

JUMP/CHARGING STUDS

Battery jump studs shall be installed on the exterior rear area of the vehicle near battery box.

COOLANT HEATER

A 110 volt coolant heater shall be provided and plumbed in the coolant system to aid in cold weather starts. The heater shall be wired to the shoreline.

110V BATTERY CONDITIONER/AUX AIR COMPRESSOR

A 110-VAC battery conditioner shall be furnished and installed on the vehicle. The battery conditioner shall be wired to maintain the chassis battery system when the vehicle is parked.

An auxiliary air compressor shall be provided. The air compressor shall maintain the air brake system at operating pressure to allow immediate start-up and operational readiness.

110V AUTO-EJECT QUICK DISCONNECT

One (1) 20-amp Kussmaul Super 20 Auto-Eject quick disconnect plug/socket for the required on-board electrical components shall be installed at the left side rear face exterior of the vehicle.

WIRING

All wiring shall be numbered or color or function-coded for proper identification. Wiring shall be of stranded conductors and of a wire gauge commensurate with the anticipated maximum electrical load of the circuit.

Wires shall be insulated in accordance with the applicable standards of the Society of Automotive Engineers (SAE).

All connections shall be made with lugs or terminals mechanically secured to the conductors.

Wiring shall be secured in place and protected from heat, oil, lubricants, fire-fighting agents, and physical damage. Appropriate circuit breakers shall be provided. Circuit breaker panels shall be easily accessible for service. A copy of this diagram shall also be included in the maintenance manual.

Where wiring passes through sheet metal or structural components, rubber grommets shall be used to protect wiring and wiring looms. Precaution must be taken in all areas to guard against chafing or excessive strain.

PNEUMATIC HOSE REEL

An air hose reel with 200' of 3/8" (9.5 mm) inside diameter hose shall be supplied and mounted from the ceiling of the engine mode compartment on the right side of the vehicle. The connection will be supplied with a quick disconnect, Milton #777 female connector. Reel shall have electric rewind capability and shall have rollers attached to prevent chafing and to aid in deployment.

AIR AUTO-EJECT

A Kussmaul Auto-Eject air connection shall be supplied on the left side rear exterior of the vehicle to permit charging of the air tanks from an external air source.

EMERGENCY WARNING LIGHT SYSTEM

The vehicle shall have a custom integrated warning light system that conforms to the parameters of NFPA 414 and FAA Advisory Circular #150-5220-10E and shall consist of the following:

Rosenbauer will provide an upper and lower emergency lighting system custom designed for the vehicle that is integrated into the body structure to provide illumination in a 360 pattern around the vehicle. The lighting system shall consist of high intensity LED flashers set in a varying flashing pattern.

Integrating the lighting system into the body structure eliminates the need to position varying styles of light bars on the vehicle and the utilization of LED flashing units assures high visibility, minimal maintenance and long bulb life.

WARNING LIGHT COLOR

The lights shall be red in color.

LOWER SIDE WARNING LIGHTS

Three (3) high intensity LED lights shall be mounted on each side of the vehicle, front, midship and rear.

WARNING LIGHT COLOR

The lights shall be red in color.

LOWER WARNING DISSABLE SWITCH

A switch shall be provided in the cab to disable the lower warning lights

AIR TRAFFIC WARNING LIGHTS

Two (2) amber LED lights shall be mounted on top of the vehicle, one (1) at the left front and one (1) at the right rear.

VEHICLE RUNNING LIGHT SYSTEM

Lower vehicle clearance marker lights, with reflectors shall be furnished and installed.

HEADLIGHTS

Four (4) Front high intensity head lamps w/ high/low beam (two pairs).

WIG-WAG HEADLIGHT FLASHER

A wig-wag flasher shall be installed in the headlights. The wig-wag headlight flasher shall activate when the vehicle parking brake is released, and the Master Warning Light Switch is "ON".

AIRFIELD DRIVING LIGHTS

Two (2) high intensity LED airfield driving lights shall be supplied and mounted below the front bumper with switch located on the dash.

SAFE TO APPROACH LIGHTS

Green in color safe to approach lights shall be provided and mounted on each side of the vehicle to allow personnel working around the vehicle exterior visual notification that the vehicle park brake is applied, and the vehicle is safe to approach.

The lighting shall turn off when the park brake is released.

CAB INTERIOR LIGHTS

Three (3) interior cab dome lights selectable between red and white lens illumination and capable of manual or automatic operation shall be installed.

BRAKE/TAILLIGHTS

Red LED rear face upper lights with reflector shall be installed. These lights shall function as stop lights and taillights.

REVERSE LIGHTS

Two (2) LED white, reversing lights shall be installed. These lights shall illuminate when the vehicle transmission is placed in reverse.

DIRECTION INDICATING LIGHTS

LED directional (signal) indicators front and rear shall be installed. These lights shall also function as road hazard warning lights.

LICENSE PLATE

A lighted license plate bracket shall be installed at the front and rear.

FOG LIGHTS

Clear fog lights shall be provided on the lower front face of the cab with switch located in the cab.

COMPARTMENT LIGHTS

Each compartment will be supplied with weatherproof LED strip lights that are switched to automatically light when compartment doors are opened, and the vehicle master switch is in the "on" position. This includes pump, undertank, and engine compartments.

UNDER TRUCK LIGHTING

Under truck lights shall be provided under the engine module allowing proper area work lighting around the rear of the vehicle. The system shall be wired to the vehicle's parking brake to activate whenever the parking brake is set.

Under cab lighting shall be provided wired to activate with the cab doors opening when the interior cab dome light is in the door/center position.

DECK and WORK LIGHTS

Upper deck of the truck and work surface lighting around the vehicle shall be provided. The system shall be wired to the vehicle's parking brake to activate whenever the parking brake is set.

LED SCENE LIGHTS

A total of four (4) high mounted 24-volt LED floodlights shall be provided and mounted two (2) each side of the vehicle controlled from a switch in the cab.

LED SCENE LIGHTS

Two (2) high mounted 24-volt LED floodlights shall be provided and mounted on the lower rear of the vehicle controlled from a switch in the cab.

VEHICLE AUXILIARY POWER UNIT SYSTEM

A Rosenbauer 8KW 120/240V diesel generator/auxiliary power unit (APU) system with hour meter shall be provided and mounted on top of the vehicle.

The system shall be designed to reduce vehicle idle time, fuel consumption and the release of toxic pollutants.

As switch shall be provided accessible to the operator to activate and deactivate the APU when required.

The integrated APU control system will shut down the chassis main engine when the APU is selected which will allow control of all vehicle systems, HVAC, scene lighting, emergency lighting, winterization etc. other than vehicle drive and pump engagement.

An auto transfer switch shall be provided allowing charging of the chassis batteries when in APU mode.

LINE VOLTAGE TRANSFER SWITCH

An automatic transfer switch shall be installed that allows components normally powered by the 120-volt shore power connection to be automatically powered by the on-board generator upon startup of the generator.

FORWARD SCENE LIGHTS

Two (2) 220V-AC powered LED Fire Research Spectra 20k lumen scene lights shall be mounted on the forward cab roof to provide illumination of the work areas forward of the vehicle. These lights shall be operated by a single cab mounted switch.

SIDE SCENE LIGHTS

Two (2) 220V-AC powered LED Fire Research Spectra 20k lumen scene lights shall be mounted on each side of the vehicle to provide illumination of the work areas adjacent to the vehicle. These lights shall be operated by a single cab mounted switch.

LIGHT TOWER

A Command Light, model Knight Series light tower shall be provided for installation on the apparatus. The location of the light tower and its controls shall be installed according to instructions given by the customer and the requirements of the light tower manufacturer.

Light Tower Construction and Design

The light tower assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance. The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum.

Light Tower Electrical System

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360-degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the lower stage and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360-degree rotation in either direction.

LIGHT TOWER LIGHT HEADS

Four (4) Fire Research Spectra 20k Lumen 220 Volt AC LED light heads shall be mounted on the light tower.

LIGHT TOWER CONTROLS

The light tower shall be controlled with a hand-held 15-foot umbilical line remote control. The storage station for the remote-control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature.

ELECTRIC CORD REEL

One (1) electric cord reel 200 ft (61 m) of 12/3 safety yellow wiring shall be provided. Reel shall be tied to a 20-amp circuit breaker. The cord reel shall have a DC electric rewind motor and shall be mounted in a compartment on the left side of the vehicle. The cord reel shall have a means of manually rewinding if needed. The cord reel will be supplied with a roller system to prevent chafing of the cord and to aid in its deployment. The cord shall be terminated in a twist lock plug conforming to NEMA L5-20.

LIGHTED WEATHERPROOF JUNCTION BOX

A weatherproof junction box with lighted indicator shall be provided with a L5-20 receptacle plug to be used with the cord reel.

JUNCTION BOX OUTLETS

Four (4) 20-amp household outlets shall be provided in the junction box.

120V WEATHERPROOF OUTLETS

Two (2) 120 VAC 20-amp duplex receptacles w/ weatherproof covers shall be provided one (1) each side of the vehicle engine mod. The receptacles shall be wired to individual circuit breakers and shall be 20-amp household receptacles.

120V OUTLET

One (1) 120 VAC 15-amp duplex household receptacle shall be provided in the cab.

POWER INVERTER

There shall be a DC to AC power inverter system with a 30-amp AC transfer switch furnished on the apparatus. The shore power shall be connected to the system AC output receptacle to supply power to the AC load.

The inverter shall be a Vanner model TS24-1500-DC with the following features and components:

- 1500-Watt Power Inverter.

Underwriters Laboratories Listed and Certified.

LITTLE GIANT OVERHAUL LADDER

A Little Giant Overhaul ladder will be mounted on the right side rear of the vehicle.

GRAPHICS

Graphics to match previous Panther

AMDOR COMPARTMENT DOORS

Amdor compartment doors with metal barrel to protect door while rolling up and rain catch will be provided for all roll up doors. Doors will be painted job color.

FLIR/COLOR CAMERA

A combination color FLIR and color camera system will be provided and mounted on the cab roof.

54' HIGHT REACH EXTENDABLE TURRET

An articulating, telescoping aerial device with elevated turret shall be installed behind the cab on a pedestal above the frame rails mounted for maximum stability and best weight distribution. Elevation of the turret shall be approximately 54 feet [16.5m], measured from ground level (subject to mounting base height on vehicle). Maximum horizontal reach shall be approximately 37.5 feet [11.4m], measured from the center of turntable rotation. The turret shall be capable of being positioned within 2 feet [.6m] of ground level in front of the vehicle. The design of the boom shall not allow the boom to come into contact with the cab without the use of any electronic safety devices.

54' MAST

The lower mast shall be a ladder structure made from 6" x 4" x ¼" [152.4 mm x 101.6 mm x 6.35 mm] high-strength steel tubing. The lower mast shall be elevated by two 4" [101.6 mm] bore x 30" [762 mm] stroke hydraulic cylinders.

54' BOOM

The telescopic boom sections shall consist of two extruded aluminum-alloy, heat-treated rectangular tubes. The size of the larger upper boom shall be 13¼" x 9¼" (336.6 mm x 235 mm) and the smaller (inner) upper boom shall be 10" x 7¾" [254 mm x 196.9 mm]. The booms shall be aluminum alloy 6061-T6. The upper boom shall be elevated by one 6" [152.4 mm] bore x 30" [762 mm] stroke hydraulic cylinder. The upper boom internal hydraulic extension cylinder shall be 2-1/2" [63.5 mm] bore x 195-1/4" [4959.35 mm] stroke.

OPERATION MANUAL

At time of delivery, an aerial manual shall be supplied which shall include aerial operation overview, service documentation, wiring schematics and technical high-level bill of material drawings. The documentation shall address at a minimum the inspection, service, and operations of the fire apparatus and all major components thereof. This documentation and manuals shall be provided in the English language.

PARTS & LABOR WARRANTY

Rosenbauer Aerials shall provide a one (1) year or 100,000 miles overall parts warranty as follows:

The aerial manufacturer shall warrant to the purchaser that the complete Stinger device and system was manufactured to comply with the manufacturer's bid specifications and free in all respects from any defects in materials or workmanship.

The warranty shall expire on the earlier of one (1) year or 100,000 miles from the date of delivery or acceptance of the apparatus. This warranty shall include all parts. The cost of transportation of vehicle to the warranty location shall be provided by the purchaser.

The obligations of the aerial manufacturer, pursuant to the foregoing warranty, with respect to the Stinger shall be limited to the cost of bringing such Stinger into compliance with the specifications or of removing any defects in materials or workmanship.

All warranty work performed must be completed at the Rosenbauer facility or a Rosenbauer approved service center.

Any work or alterations on or misuse of the Stinger performed by anyone other than the aerial manufacturer's designated personnel, either before or after delivery to the purchaser, shall not be warranted by the manufacturer and shall cause to make this warranty invalid.

This warranty shall not apply to those items which are usually considered normal maintenance and upkeep services, including, but not limited to electrical lamps, valve seals, normal lubrication and/or proper adjustment of minor items.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by Rosenbauer Aerials.

STINGER PAINTED

Booms, mast and pedestal assemblies shall be pre-cleaned, chemically etched, primed with PPG #F3980 primer and finished with Black PPG# 9300 black high-quality automotive finish.

ROTATION SYSTEM

The turntable bearing shall be 23½" [596.9 mm] minimum outside diameter with a minimum rating of 130,000 lbs.-ft. [176.3 kN-m] overturning moment.. The rotation drive shall utilize a spur gear running on the exterior of the rotation bearing. The spur gear shall be on the output of a planetary reduction gearbox assembly. This planetary gear box shall have a spring-applied, hydraulically-released brake and is to be internally driven by a reversible high torque, low speed hydraulic motor. The gearbox design shall prevent drifting of the turntable. The rotation system shall include a 4" diameter water swivel mounted directly to the base super structure and shall rotate with the turntable assembly. The rotation system also includes a Can-BUS controlled encoder that monitors the rotation and bedding of the boom device.

The turntable is bolted to the bearing and provides the pivot and cylinder mount for the lower mast of the elevating boom.

PEDESTAL

The Stinger shall set on top of a pedestal that is a tubular structure in the lower half to leave as much open space as possible to accommodate pump piping. Each of the four tubular structures shall be bolted for easy removal and access to the main pump. The four legs shall be bolted directly to a base plate mounted directly to the frame.

CONTROL PANEL

The boom and the turret with its nozzle (and optional piercing device) shall be controlled by the single multi-function joystick. It is possible to run combined movements of the boom and the turret (or the piercing tool) with this kind of joystick.

When the Stinger is not activated the main joystick controls the turret. In case the Stinger is activated, the main joystick controls the boom and a small thumb-joystick, installed on top of the main joystick controls the turret.

The joystick has three axis control. Left and right motion shall proportionally control turntable rotation. Forward and back motion shall proportionally control vertical sweep. Twisting the joystick right and left proportionally extends and retracts the fly boom.

The thumb-joystick on has dual axis control. Left and right motion shall control horizontal sweep of the turret. Forward and back motion shall control vertical sweep.

Buttons around the thumb-joystick shall control the nozzle functions.

These functions are:

- **straight stream/fog patterns**
- **high/low flow selection**
- **auto-level**
- **dry-chem (option)**

The multi-function joystick control shall include LED indicators relating to nozzle functions. When a function has been activated, the indicator shall illuminate.

Forward and back motion shall proportionally control lower mast and the upper boom elevation until the lower mast is fully elevated. When lower mast is fully elevated, the forward motion shall proportionally control the upper boom down and the back motion shall proportionally control the upper boom up with pre-programmed coordinated motion of the boom.

The boom control valves shall be equipped with manual override feature to use in the case of electrical failure to the valves.

An automated programmable logic controller shall be provided for standard operations of hydraulic controls. The automated controller shall accept input from sensors and the single multi-function joystick and direct these inputs to the hydraulic valves. Joystick motion shall be "ramped" so that slow precise boom positioning can be achieved, with operating speed increasing as the joystick is moved to its travel limit. Cushioned stops shall be programmed to automatically slow down boom motion as cylinders reach end of stroke.

STOW FEATURE

The "STOW" feature shall be activated from any boom position when the operator is ready to bed the unit. When activated, the "STOW" operation shall rotate, retract and lower the upper boom and lower mast to the bedded position in the proper sequence under programmed control.

The programmed logic control system (PLC) shall operate as a distributed control system with Controller Area Network (CAN) type communications bus per ISO standards. The PLC shall provide overall system management and communication. Boom tip and mast positions shall be sensed with encoder type devices to assure maximum reliability and repeatability. A plumbed override switch shall be included in the cab to override safety functions in case of sensor defects.

When the truck is power up, it will be in **STOWED ATTACK** position. Cab-mounted switches and indicator lights shall be provided to allow the operator to select the following boom positions:

- **BOOM STOWED**
- **HIGH ATTACK**
- **MID ATTACK**
- **LOW ATTACK**

PIERCING FEATURE

When activating the piercing tool, the turret will rotate out of the way and the piercing tool is active. The thumb-joystick switches from turret control to pierce control.

Forward and back motion shall control vertical sweep of the piercing tool. Buttons around the thumb-joystick shall control the pierce functions:

- **retract and slowly extend the piercing needle**
- **auto-level**

An additional button besides the joystick fires the piecing tool.

SWIVEL

There shall be a 4" waterway swivel. It shall be installed on the pedestal and rotate with the turntable 30 degrees to the left and 30 degrees to the right.

PERFORMANCE CAPABILITIES

The water discharge piping system shall be capable of flowing 1,000 GPM [3,785 LPM] with the boom elevated while creating minimum friction loss. It shall meet all discharge performance requirements set forth in FAA Advisory Circular #150/5220-10E or latest standard.

WATERWAY

A waterway shall be provided from the pedestal to the tip of the boom. The telescoping waterway shall be fabricated of aluminum. The lower mast waterway and extending boom shall have a 4-1/2" to 4" O.D.

DRY CHEMICAL TUBING

There shall be dry chemical line consisting of a 3" to a 2.5" telescopic tube on the left hand side of the boom. A 1-1/2" hose is routed from the base of the pedestal and connected to the rear of the telescopic chemical tube.

HALOTRON TUBING

There shall be Halotron chemical line consisting of a 3" to a 2.5" telescopic tube on the left hand side of the boom. A 1-1/2" hose is routed from the base of the pedestal and connected to the rear of the telescopic tube.

MONITOR

The maximum output of the nozzle shall be 3.800 lpm (1.000 gpm). However, the nozzle must operate over a minimum 180° horizontal sweep (90° right to 90° left) and 200° vertical range (100° up to 100° down).

With the o-stream nozzle it should be possible to adjust the spray pattern from full jet spray to disperse spray. The o-stream nozzle with fluidically optimized water guidance allows most effective transformation of water pressure into speed. It should be possible to change the flow rate from full flow to 50% flow in the nozzle.

Electric motors permit infinite adjustment of spray pattern (from full jet to disperse spray) and rate.

All drives of the turret should be electric driven.

The monitor shall be controlled by the CAN bus system and shall be operated with the same joystick as the boom.

It should be able to level the turret with the vehicle. In addition the turret shall have the ability to drive in oscillation mode. In this mode it automatically moves the turret along the shape of a rectangle. Swivel angle and height of the rectangle are adjustable during operation.

DRY CHEMICAL NOZZLE

Used with fire-extinguishing powder. The ROSENBAUER CHEM-CORE-Nozzle works with powder which is injected centrally into the water-jet and transported directly to the fire bundled with the water-jet. The advantages over conventional foam turrets are a definitely higher throw range, concentrated distribution and better accuracy with the powder. The ROSENBAUER CHEM-CORE-Nozzle also allows combined operation with water / foam (non-air-aspirated) and powder. The nozzle is infinitely adjustable in rate and spray pattern for water and water foam by electric motors.

Max. flow rate water and water/foam: 6.000 lpm (1585 gpm) at 10 bar (150PSI) in stow position of the HRET and 3.800 lpm (1.000gpm) at 10 bat (150PSI) with extended boom.

Max. flow rate powder: 10 kg/s (22lbs/s) for 14bar (203PSI) powder unit and 20kg/s (44lbs/s) for 28bar (406PSI) powder unit.

PIERCING TOOL

An independent auxiliary nozzle with a piercing applicator shall attach to the telescoping boom to provide remote controlled penetrating capability. A high tensile steel tip shall provide a spray pattern with 250 GPM [950 LPM] or more flow. The piercing nozzle shall have the capability to provide a separate water/foam discharge with selector switch labeled "Pierce/Volume". The tip shall be removable. The piercing lance shall be retracted inside a tube when not in use to protect the piercing tip. The lance shall be hydraulically fired with amplified hydraulic flow from three 2,800 PSI (193 bar) hydraulic accumulators for maximum piercing velocity and impact.

The piercing nozzle shall be controlled by switching the single multi-function joystick to piercing mode. Moving the joystick forward lowers piercing tip and pulling back raises the tip. Rotation up and down of the piercing device is accomplished with an enclosed hydraulic helical rotator with counterbalance valves to protect against accidental rotation.

When pierce mode is selected, the volume nozzle shall automatically rotate to a park position to provide maximum piercing depth.

VALVES PIERCING TOOL

Piping and hydraulic valving to the HRET piercing device shall be provided. The piping and hydraulic valving will be capable of operating the piercing device rotation, piercing and reloading functions.

An additional 2" ball valve shall be provided to allow flow to the piercing device. An auto drain shall be installed near the piercing tool to allow for water to be dispersed.

TRACKING LIGHTS

Two (2) Whelen Micro Pioneer™ Model # MPP4WCS lights shall be installed on the base boom. The 45 watt +24 DC, 3.25 Amp, Micro Pioneer lighthouse configuration shall incorporate 12 white Super-LED® with a TIR reflector and a polycarbonate cover with a chrome finish. The MPP4WCS lights shall be activated from the tracking lights switch on the main control station and have an On/Off

switch covered by a rubber boot and a black fiberglass enforced polycarbonate handle. The MPP4WCS shall have a standard 8° spot light lens. The MPP4WCS light shall have 4,100 usable lumens.

TIP MARKER LIGHT

One (1) amber Tomar strobe light, model # 470S-1280-A, shall be installed at the tip of the boom.

TIP LIGHT

One (1) Whelen Micro Pioneer™ Model # MPP4WCS shall be installed on the boom. The 45 watt +24 DC, 3.25 Amp, Micro Pioneer lighthouse configuration shall incorporate 12 white Super-LED® with a TIR reflector and a polycarbonate cover with a chrome finish. The MPP4WCS lights shall be activated from the tracking lights switch on the main control station and have an On/Off switch covered by a rubber boot and a black fiberglass enforced polycarbonate handle. The MPP4WCS shall have a standard 8° spot light lens. The MPP4WCS light shall have 4,100 usable lumens.

Hydraulic Oil Tank, New Style

EMERGENCY BACK UP PUMP

A self-contained hydraulic power unit consisting of an integral pump and direct current motor shall be provided as an alternative power source in event of engine-driven hydraulic pump failure. The unit shall be capable of returning the booms to a bedded position.

CAMERA WIRING

Wiring shall be installed up the boom for a camera to be connected to. The camera shall be installed at the tip of the boom.

BRONZE BUSHINGS

All bushings on the device shall be bronze.
Export Parts Received Freight Charge

AUTHORIZATION TO SIGN

ROSENBAUER AMERICA, LLC



Palm Beach County Fire Rescue
2601 Vista Parkway
Palm Beach, FL. 33411

RE: One (1) Panther 6x6 HRET ARFF Vehicle Per Sourcewell contract 113021-RSD

On March 28, 2023, a written action of the Supervisory Board of Rosenbauer America, LLC was issued, appointing Mr. Randy Brummel as President of Rosenbauer America, LLC and its subsidiaries. A copy of this document is attached.

Should you have any questions regarding the above information, feel free to contact our office.

Bidder: Rosenbauer Minnesota, LLC

Attachments Enclosed

Contact

ROSENBAUER SOUTH DAKOTA, LLC
100 THIRD STREET
LYONS, SOUTH DAKOTA 57041
P: 605.543.5591

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ROSENBAUER MOTORS, LLC.
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ROSENBAUER AERIALS, LLC.
870 SOUTH BROAD STREET
FREMONT, NEBRASKA 68025
P: 402.721.7622

**ROSENBAUER AMERICA, LLC
WRITTEN ACTION OF THE SUPERVISORY BOARD
IN LIEU OF SPECIAL MEETING AND
WAIVER OF NOTICE OF SPECIAL MEETING**

R2023 1904
March 28, 2023 DEC 19 2023

The undersigned, being Members of the Supervisory Board of Rosenbauer America, LLC (the “Company”), a Delaware limited liability company, do hereby waive any and all requirements for the holding of a meeting of the Supervisory Board of the Company and do hereby unanimously take the following actions and adopt the following preambles and resolutions by signing the written consent hereto:

W I T N E S S E T H:

WHEREAS, the Supervisory Board have determined that it is advisable and in the best interests of the Company to enter into and approve the resolutions set forth herein; and

RESOLVED, that the Supervisory Board of the Company does hereby dismiss Mark Fusco as President of the Company and with affective date March 30th, 2023 appoint Randy Brummel as the new President pursuant to Section 8.02 and Section 7.04 of the Second Amendment of the Amended and Restated Operating Agreement of the Company effective August 1, 2022 (the “Amended Operating Agreement”).

BE IT FURTHER RESOLVED, that the Supervisory Board does hereby appoint the following persons as its two (2) designees to the Management Board of Rosenbauer Aerials, LLC:

1. Randy Brummel; and
2. Thomas Ruschitzka.

The actions taken by this written consent have the same force and effect as if taken by the undersigned at a meeting of the Supervisory Board of the Company duly called and constituted pursuant to the laws of the State of Delaware. This written consent may be executed in two or more counterparts, each of which will be deemed an original for all purposes, and together will constitute one and the same written consent. A facsimile or electronic copy of a signature shall be as binding as an original signature.

[Signature Page Follows]

IN WITNESS WHEREOF, the undersigned, being all of the members of the Supervisory Board of the Company under the Amended Operating Agreement, have executed this written consent as of the date first written above:

SUPERVISORY BOARD:

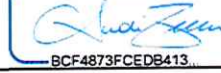
DocuSigned by:



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Sebastian Wolf, Rosenbauer International AG

DocuSigned by:



BCF4873FCEDB413

Andreas Zeller, Rosenbauer International AG

DocuSigned by:



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Thomas Ruschitzka, Rosenbauer International AG

To: Palm Beach County Fire Rescue
2601 VISTA PARKWAY
Palm Beach, FL. 33411

Date: November 27, 2023

We hereby propose and agree to furnish, after your acceptance of this proposal and the proper execution by (Palm Beach), hereinafter called the Buyer and an officer of (Rosenbauer Minnesota, LLC), hereinafter called the Company, the following apparatus and equipment.

One (1) Rosenbauer Panther 6x6 HRET ARFF Vehicle per Sourcewell contract 113021-RSD \$1,384,137.00

One Million Three Hundred Eight-Four Thousand, One Hundred Thirty-Seven Dollars*
DOES NOT INCLUDE TAX, ANY APPLICABLE TAX SHALL BE THE RESPONSIBILITY OF PALM BEACH
****PRICE VALID FOR THE REMAINDER OF 2023****

All of which are to be built in accordance with the specifications, clarifications and exceptions attached, and which are made a part of this agreement and contract.

DELIVERY: 425 days from receipt of order. (chassis and (or) major components must arrive within 150 days or delivery may be extended), subject to all causes beyond the Company's control.

"Delivery" means the date company is prepared to make physical possession of vehicle available to the customer.

CONTRACT CHANGES: After execution and acceptance of this Contract, the Buyer may request that the Company incorporate a change to the Products or the Specifications for the Products by delivering a Change Order to the Company; provided, however, that any such Change Order must be in writing and include a description of the proposed change sufficient to permit the Company to evaluate the feasibility of such Change Order. Within seven (7) working days of receipt of a Change Order, the Company will inform the Buyer in writing of the feasibility of the Change Order, the earliest possible implementation date for the Change Order, of any increase or decrease in the Purchase Price resulting from such Change Order, and of any effect on production scheduling or delivery resulting from such Change Order. The Company shall not be liable to the Buyer for any delay in performance or delivery arising from any such Change Order. Purchase Price may be modified only by mutual written agreement of the Parties because of changes to the Apparatus required or requested by the Buyer during the construction process pursuant to Appendix C, Change Order Policy. Any changes in the Purchase Price resulting from changes to the Apparatus required or requested by the Buyer during the construction process shall be stated in the Change Order signed by both parties. Additional Changes: If various state or federal regulatory agencies (e.g. NFPA, DOT, EPA) require changes to the specification and/or the product that result in a cost increase to comply therewith this cost will be added to the Purchase Price to be paid by the customer.

FORCE MAJEURE: The Company shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond the Company's control which make the Company's performance impracticable, including but not limited to civil wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.

PAYMENT TERMS: Final payment for the apparatus shall be made at time of delivery or pick up of the completed vehicle. It is the responsibility of the Buyer to have full payment ready when the apparatus is complete and ready to deliver. If payment is delayed or delivery is delayed pending payment, a daily finance and storage fee may apply. Upon delivery of the apparatus or upon pickup of the apparatus by the Buyer, the Buyer agrees to provide all liability and physical damage insurance. It is further agreed that if on delivery and testing, any defects should develop, the Company shall be given reasonable time to correct changes. Guarantee of the chassis is subject to the guarantee of the chassis manufacturer. *NOTE: upon final inspection at the factory for pick-up or delivery, the Buyer will need to supply a Certificate of Insurance and full payment prior to release of the vehicle, unless prior arrangements for vehicle's release have been made.

www.rosenbaueramerica.com

info@rosenbaueramerica.com

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P: 651.462.1000

ROSENBAUER AERIALS, LLC.
870 SOUTH BROAD STREET
FREMONT, NEBRASKA 68025
P: 402.721.7622

TITLE: The Apparatus shall always be the property of the Company until it is delivered to the Buyer pursuant to the terms of this agreement. The Company shall bear the sole responsibility and risk for destruction, loss or damage to the apparatus, or any portion of the Apparatus, through the state and time it is delivered to the Buyer. The Company shall deliver good and merchantable title to the Apparatus at the time it is delivered to the Buyer. The Buyer shall bear the sole responsibility and risk for destruction, loss or damage to the Apparatus upon the date and time it takes delivery of the Apparatus.

PIGGY BACK ORDERS: The Company, at its sole discretion, will allow the terms of the contract to be extended to both the Buyer, as well as to other Municipal, State, or Federal agencies for similar unit(s). The Company will allow tag on / additional orders for up to three (3) years from the date of contract execution. To facilitate pricing, the Company will quote the original price plus manufacturer's price increases or Producer's Price Index (PPI) whichever is greater as it applies to either Fire Apparatus and/ or commercial heavy truck industries.

MISCELLANEOUS PROVISIONS: This agreement shall be construed in accordance with the laws of the State of Florida. The parties agree that any litigation arising from or in connection with any dispute between the parties under this agreement shall be venue in Palm Beach County Florida. The parties agree that this agreement bears a rational relationship to the State of Florida, and they consent to the personal jurisdiction of such state and further consent and stipulate venue in the above-described court.

After company receipt of this document signed by the Buyer, the document will be reviewed and upon approval, countersigned by the Company thereby putting the document in force.

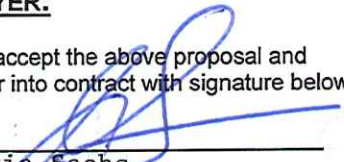
ROSENBAUER MINNESOTA, LLC



Title President
Randy Brummel
11-27-2023 Date

BUYER:

We accept the above proposal and enter into contract with signature below.



Title Mayor
Maria Sachs
12-19-2023 Date

R2023 1904 DEC 19 2023

Approved as to Form and Legal Sufficiency



County Attorney

Approved as to Terms & Conditions



Director of Airports

www.rosenbaueramerica.com

info@rosenbaueramerica.com

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P: 402.721.7622

APPENDIX C CHANGE ORDER POLICY

This change order policy is intended to reflect the increased cost of changes which result in delayed deliveries, confused paperwork, poor production flow and increased potential of trucks being built to incorrect specifications. With your cooperation, changes can be kept to a minimum which means we will be able to reduce lead times, increase production and maintain costs which will benefit all of us.

Our objective is accurate, high quality and on-time deliveries exceeding our customer expectations.

Changes any time after the order is received may delay the quoted delivery date. Significant design or component changes will have the largest impact on the schedule and quoted delivery date. Changes that occur later in the process will also have the largest impact on the schedule and quoted delivery date.

All time fences are reference to contract execution date if not otherwise stated.

Change Window #1

All changes will be priced at standard pricing and specials will be priced through our normal process. Significant changes made to the vehicle during this time period may result in a delivery extension.

RBM Chassis	0-60 days
RBA Aerial	0-60 days
Rosenbauer Body	0-60 days

Change Window #2

All changes are subject to a 25% mark-up, as well as a \$250.00 change order processing fee. All changes are subject to factory review and may be denied due to engineering or lead time issues.

RBM Chassis	61-75 days
RBA Aerial	61-75 days
Rosenbauer Body	61-120 days

Change Window #3

All changes are subject to a 50% mark-up, and 50% restocking fee on deleted items, as well as a \$250.00 change order processing fee. All changes are subject to factory review and may be denied due to engineering or lead time issues. No major components can be changed at this time; major components are considered engine, transmission, axles, suspension, cab, frame (wheelbase), seats, water pump and water tank.

RBM Chassis	76-120 days
RBA Aerial	76-120 days
Rosenbauer Body	121-180 days

Change Window #4

Changes are not recommended at this time. Any changes requested will be priced on a time and material basis, as well as a \$500.00 change order processing fee. Any changes requested, and that are quoted to the customer, must be approved by the customer within three days or they will not be valid.

RBM Chassis	After 120 days
RBA Aerial	After 120 days
Rosenbauer Body	After 180 days

**Note: Any late change orders that are factory driven will be done at cost and no additional mark up or penalties will apply.*

Initials _____

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