DO NOT INVOICE THIS ADDRESS

City and County of Denver
Purchasing Division
201 W. Colfax Ave Dept. 304
Denver, CO 80202
United States of America
Ph: 720-913-8100 Fax: 720-913-8101

Purchase Order Number	PO-00114711
Purchase Order Date	Apr 22, 2022
Contract ID	
Payment Terms	Net 30
Payment Type	Check
Buyer	Leann Rush (303) 342-2298 Leann.Rush@denvergov.org

Supplier

OSHKOSH TRUCK CORP
7747 COLLECTIONS CENTER DRIVE
CHICAGO, IL 60693
United States of America
Ph: (920) 235-9151

Ship-To

DEN Maint Center
27500 E 80th Ave Unit A
Denver, CO 80249
United States of America
Steven Ricci

Bill To

Denver International Airport 8500 Pena Boulevard
Room 8870
Denver, CO 80249-6340
United States of America
Steven Ricci

Currency	Total Lines Amount	Tax Exempt	Total PO Amount
USD	$2,096,367.00	98-02890-0000	$2,096,367.00

Shipping Terms	Shipping Method	Shipping Instructions
FOB Destination	Common Carrier	

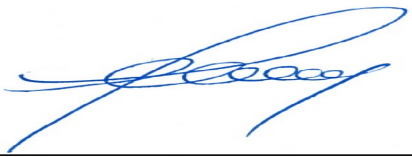
Goods Lines

Line Number	Item Name	Supplier Item Identifier	Description	Due Date	Unit of Measure	Quantity	Unit Price	Line Amount
1			Oshkosh Global Striker		Each	1	$1,862,165.00	$1,862,165.0
2020 Capital Replacement for Z-F-023 Delivery in 2023								
2			Oshkosh optional add equipment package		Each	1	$205,820.00	$205,820.00
2020 Capital replacement for Z-F-023 Delivery in 2023								
3			Auxiliary equipment		Each	1	$28,382.00	$28,382.00
2020 Capital Replacement for Z-F-023 delivery in 2023								

This PO is for received model year Oshkosh New Generation Striker 8x8, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turr (300 gpm), One Handline (Foam/Water), Water Tank Capacity (4500 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Single Stage Centrifugal, 1950 gpm at 250 psi), dual engine driveline. Including all options as specifically outlined in quote dated 4/4/2022 prepared by Brianna Propson and Rich Voakes. Delivery date 400 days ARO

This Purchase Order has been issued in accordance with DRMC 20-64.5 of the Revised Municipal Code: Cooperative Purchasing supported by Sourcewell Pricing Contract #113021-OKC. The City and County of Denver Colorado's terms and conditions herein supersede and replace all terms and conditions of Sourcewell Pricing Contract #113021-OKC.
Shipping: F.O.B. Denver, CO. 80249, Payment: Pricing listed includes volume discount and delivery. Term: Net 30 upon receipt of vehicles.
* This Purchase Order is contingent upon approval by City Council as required in DRMC 3.26(e) *

All Titles to Read:
City and County of Denver
201 West Colfax Avenue Dept. 304
Denver, CO 80202
Contact person for delivery and other questions is Steve Ricci at 303-342-2778 or steven.ricci@flydenver.com
Vendor to fill in and submit Vehicle Check-In Sheet.
Delivery will NOT be considered complete without it.
Delivery: Monday through Friday between 8:00am and 4:00pm. Location:
DENVER INTERNATIONAL AIRPORT FLEET
27500 E 80th Ave, Unit A, Denver, CO 80249
Documents to be provided upon delivery:
Application for Title, State of Colorado Odometer Statement



Authorized By

By accepting this Purchase Order you agree to the Terms and Conditions of the General Services Purchasing Division. Follow the URL provided to the Purchase Order Terms and Conditions – http://www.denvergov.org/content/denvergov/en/purchasing-main-page/POterms.html

Quote Valid for 90 days

Contract #: 113021-OKC

Date: 4/4/2022

Buying Agency:	Denver International Airport	**Contractor:**	Oshkosh Airport Products
Contact Person:	Steve Ricci	**Prepared By:**	Brianna Propson / Rich Voakes
Phone:	303-342-2778	**Phone:**	920-410-4158
Email:	steven.ricci@flydenver.com	**Email 1:**	rvoakesjr@airport.oshkoshcorp.com
Sourcewell Product Code	SF04		
General Description of Product:	**Oshkosh New Generation Striker 8x8, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turret (300 gpm), One Handline (Foam/Water), Water Tank Capacity (4500 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Single Stage Centrifugal, 1950 gpm at 250 psi), dual engine driveline**		

A. Catalog / Price Sheet Items being purchased - Itemize Below - Attach Additional Sheet If Necessary

Quan	Description	Unit Pr	Total
1	Oshkosh New Generation Striker 8x8, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turret (300 gpm), One Handline (Foam/Water), Water Tank Capacity (4500 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Single Stage Centrifugal, 1950 gpm at 250 psi), dual engine driveline	$1,276,744	$1,276,744
1	See "Build Sheet" tab on next page for machine specs	$205,820	$205,820
		Subtotal A:	$1,482,564

B. Sourced and/or UnSourced Contracted Items

Quan	Description	Unit Pr	Total
1	Upgrade to 770 hp engines		$54,236
1	Upgrade all tires to Michelin (8 tires and 1 spare)		$36,018
1	Upgrade to DISC Brakes		$28,327
1	Halotron re-servicing kit		$11,418
1	Removable Number Panels - 6 Sets of Panels with LED Lights		$5,635
1	Dual Payload FLIR/Video Camera M364CLR, 360 Degree Camera System and Safety Vision Observor 4112 DVR		$54,483
1	Rigid Lighting Upgrades		$17,053
1	Wil-Burt Nightscan 4.5 Light Tower W/ 6 Whelen LED Lightheads		$33,072
1	No Smoke 2 Systems		$32,821
1	Storage Tool Boards and Compartment Specials - Crosslay and Cord Reel		$9,361
1	5 year warrnaty extension - Oshkosh drive train and Scania engines		$8,500
1	Radio Equipment - Specific model information to be provided by customer 30 days ARO		$30,964
1	Auxiliary Equipment - see list		$28,382
		Subtotal B:	$350,270

C. Total Cost before any other applicable Charges, Trade-Ins, Allowances, Discounts, Etc. (A+B)	$1,832,834
D. Trade-Ins / Special Discounts / Other Allowances / Freight / Installation / Miscellaneous Charges	
Freight	$15,523
On-site Training	$6,000
Factory Inspection	$7,808
Subtotal D:	$29,331

Delivery Date:	**400 days ARO**	**E. Total Purchase Price (A+B+C):**	$1,862,165

Code	Option Description	Price List	Sourcewell Pricing (7% off of MSRP)	Qty	Extended
OSK-1	110 volt auxiliary air compressor with autoeject shore power connection	$ 2,281	$ 2,121	1	$ 2,121
OSK-2	110 volt engine preheater with autoeject shore power connection	$ 591	$ 550	1	$ 550
OSK-3	Battery charger with autoeject shore power connection	$ 809	$ 752	1	$ 752
OSK-4	Air inlet at rear or on either side of cab with autoeject connection	$ 411	$ 382	1	$ 382
OSK-6	Air hose reel in upper compartment with 150' of 1/2" hose	$ 3,011	$ 2,800	1	$ 2,800
OSK-9	LED ground lighting	$ 534	$ 497	1	$ 497
OSK-11	Two defroster fans in cab	$ 139	$ 129	1	$ 129
OSK-13	Upgrade to Smartdock hands' free SCBA bracket for one crew seat	$ 530	$ 493	2	$ 986
OSK-14	Add roof hatch access step in cab	$ 753	$ 700	1	$ 700
OSK-15	High output dual air conditioning	$ 5,711	$ 5,311	1	$ 5,311
OSK-18	Medical storage compartment in cab	$ 2,002	$ 1,862	1	$ 1,862
OSK-21	Height adjustable roll-out shelf in lower storage compartment	$ 773	$ 719	2	$ 1,438
OSK-25	Storage for two spare SCBA cylinders in the cab	$ 758	$ 705	1	$ 705
OSK-26	Driver and turret operator foot switches for siren and air horns	$ 520	$ 484	1	$ 484
OSK-30	Continuous duty cycle central lubrication system	$ 6,542	$ 6,084	1	$ 6,084
OSK-31	Spare tire and wheel	$ 3,608	$ 3,355	1	$ 3,355
OSK-39	Bronze water pump housing in place of standard cast iron housing.	$ 10,151	$ 9,440	1	$ 9,440
OSK-41	Swing-out feature for hosereel	$ 618	$ 575	1	$ 575
OSK-44	Structural panel with one 2-1/2" suction inlet, one 5" suction inlet and a priming pump on the LH side with "Fill from Draft" provisions	$ 5,844	$ 5,435	1	$ 5,435
OSK-46	Two 2-1/2" foam / water producing discharge outlets with bleeder valves on each side - 4 total	$ 4,871	$ 4,530	1	$ 4,530
OSK-48	One 2-1/2" and 4-1/2" water tank fill connection on right hand side	$ 1,934	$ 1,799	1	$ 1,799
OSK-49	550 lb. dry chemical system with fixed dual agent hosereel holding 100' of 1" twinned hose and a Hydro-Chem type nozzle in a lower compartment. Includes agent vessel and propellant system with system indicators in cab	$ 27,235	$ 25,329	1	$ 25,329
OSK-50	Spare nitrogen cylinder for dry chemical system.	$ 1,425	$ 1,325	1	$ 1,325
OSK-52	Foam transfer pump - pneumatic	$ 4,272	$ 3,973	1	$ 3,973
OSK-53	Electronic foam proportioning system in place of standard fixed rate, around the pump foam proportioning system	$ 20,245	$ 18,828	1	$ 18,828
OSK-57	625/1250 gpm high volume, low attack bumper turret in place of standard 300 gpm bumper turret - 6x6 and 8x8 only	$ 24,124	$ 22,435	1	$ 22,435
OSK-58	Hydro-Chem type direct injection foam/water/dry chemical nozzle option added for any dual rate roof or bumper turret	$ 6,163	$ 5,732	2	$ 11,464
OSK-59	Exterior mounted water and foam tank level lights each side	$ 595	$ 553	1	$ 553
OSK-64	One LED spotlight on bumper turret	$ 831	$ 773	1	$ 773
OSK-71	Undertruck nozzles	$ 2,681	$ 2,493	1	$ 2,493
OSK-72	Winterization system for vehicle's firefighting compartments	$ 12,013	$ 11,172	1	$ 11,172

OSK-73	460 lb. Halotron clean agent system with fixed hosereel holding 150' of 1" hose and a Halotron nozzle in an upper compartment. Includes agent vessel and propellant system with system indicators in cab.	$ 29,167	$ 27,125	1	$ 27,125
OSK-74	Spare argon cylinder for Halotron I system.	$ 1,373	$ 1,277	1	$ 1,277
OSK-75	10 Kw Onan hydraulic generator.	$ 15,806	$ 14,700	1	$ 14,700
OSK-88	Four red LED mini light bars in place of standard red LED beacons on roof	$ 4,081	$ 3,795	1	$ 3,795
OSK-90	Lower perimeter red LED warning light system with two front facing, two rear facing and three lights per side in place of standard warning lights	$ 691	$ 643	1	$ 643
OSK-93	Eco EFP Foam Testing System (EFP Proportioner)	$ 10,753	$ 10,000	1	$ 10,000
	Sourcewell Option Price	**$213,845**	**$198,876**		**$205,820**

Spec #	Description	Part#	Vendor	Qty	Price	Extended Price
	CIRCLE D LIGHTS JUNCTION BOX W/(4) NEMA L5-20 TWIST-LOCK RECEPTS. & 12" PIGTAIL CORD WITH A NEMA L5-20 MALE PLUG, CONN., & BOOT P/N PF51G-5PY HIGH VISIBILITY YELLOW FINISH	3288956	NATALE MACHINE	1	$ 521.48	$ 521.48
	WALL/SHELF VERTICAL MOUNT BRACKET FOR PF51G JUNCTION BOX P/N 213Y	3288955	NATALE MACHINE	1	$ 177.04	$ 177.04
	PKW DRY CHEMICAL, (SPECIAL ENHANCED PURPLE K), 50 LB PAILS ; WILLIAMS BRAND (PKW) ANSUL P/N 423650	8HE813	ANSUL	20	$ 183.40	$ 3,667.95
	CHEMGUARD 3% AFFF MIL SPEC C6 55 Gallon Drum P/N 770810	4302126	CHEMGUARD	10	$ 1,262.25	$ 12,622.50
Aux. List	FIRE EXTING. 30# MET-L-X DRY CHEMICAL ANSUL MX-30D	44644AX	ANSUL	1	$ 525.83	$ 525.83
Aux. List	Fire Extinguisher Mounting Bracket for ANSUL MX-30D 30889	1371063	ANSUL	1	$ 109.35	$ 109.35
Aux. List	FIRE EXTING. 15# HALOTRON=INCLUDES VEHICLE MTG BRKT=71550 & 700228	3017943	BUCKEYE,HALOTRON	1	$ 589.14	$ 589.14
Aux. List	6' PIERCE APPLICATOR 1.5 NPSH FEMALE 95 GPM AKRON P/N 10880004	1503880	AKRON	1	$ 732.16	$ 732.16
Aux. List	AKRON 2129 Shut Off 1.5" NPSH x 1.5" NPSH P/N 21290002	2399401	AKRON	1	$ 303.75	$ 303.75
Aux. List	SOUTH PARK - WRENCH SET, INCLUDES 2 USW 7501A SPANNER WRENCHES, MOUNTING BRACKET W/GASKET. P/N 707-WH76-2	2926556	SAFETY FIRST	1	$ 75.07	$ 75.07
Aux. List	SENSIBLE PRODUCTS - CLAMP BRACKET. FITS TOOLS OR PART THAT ARE 1" TO 1.5" DIAMETER P/N 703-#QFB	2588776	SAFETY FIRST	2	$ 15.53	$ 31.05
Aux. List	FIREHOOKS - 8 LB PICK HEAD "FORCE AXE W/ FIBERGLASS HANDLE. ***6 Lb is our standard. 8 lb will be provided.	TBD	SAFETY FIRST	1	$ 135.00	$ 135.00
Aux. List	SENSIBLE PRODUCTS AXE BLADE BRACKET P/N 703-#AXB	2231022	SAFETY FIRST	1	$ 39.83	$ 39.83
Aux. List	SENSIBLE PRODUCTS AXE HANDLE TULIP CLIP P/N 703-#TCC	2231024	SAFETY FIRST	1	$ 44.98	$ 44.98
Aux. List	TRIPLE WRENCH HOLDER WITH (1) STYLE 15 & (2) STYLE 10 WRENCHES, AKRON 2443	1941520	AKRON	1	$ 109.85	$ 109.85
Aux. List	DUAL WRENCH HOLDER W/2 UNIVERSAL SPANNERS (3/4" TO 3") AKRON #448	50422AX	AKRON	1	$ 76.48	$ 76.48
Aux. List	KOCHEK- 4 UNIVERAL STORZ SPANNER WRENCHS W/ HOLDER P/N 430-KS34	1409131OSH	SAFETY FIRST	1	$ 168.60	$ 168.60
Aux. List	DIXON PUMP ON CART			1	$ 8,452.08	$ 8,452.08
	Total					$ 28,382.00

Oshkosh Airport Products #113021-OKC

Pricing for contract #113021-OKC Oshkosh Airport Products is provided at 7% off MSRP on ARFF products to Sourcewell participating agencies.

Additional discounts may be available for identical multi-unit purchases. Discount varies dependent on the number of identical units, the configuration of the units, and will be handled on as case by case basis.

Authorized Oshkosh service providers may offer service contracts for preventative maintenance and other services. Pricing would be quoted at time of request based on customer requirements and does not include a percentage discount.

DENVER INTERNATIONAL AIRPORT

CLASS 5

AIRCRAFT RESCUE AND FIRE FIGHTING VEHICLE

WITH AGENT CAPACITIES OF:

- **4500 GALLONS (17,034L) OF WATER**
- **540 GALLONS (2,044L) OF AFFF CONCENTRATE**
- **500 POUND (227249kg) DRY CHEMICAL SYSTEM**
- **460 POUND (209kg) HALOTRON CLEAN AGENT**

SPECIFICATION REVISED

March 17, 2022

GENERAL CHARACTERISTICS

Definitions:
This document is intended to outline the technical specification requirements for an airport rescue firefighting (ARFF) vehicle in accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5110-10E and the National Fire Protection Association (NFPA) 414, 2020 edition or current editions. This specification is for one new Class 5 (4500 gallon, 17,034L) ARFF vehicle as defined by the FAA.

Expected Use:
This specification covers an all-wheel drive, diesel powered ARFF vehicle having a mechanically driven pump and an electronically controlled foam proportioning system designed for extinguishing flammable and combustible liquid fuel fires. The specified dry chemical and clean agent complimentary agent systems are required, acceptable additions to the basic vehicle as dictated by local operational needs. The primary function of the vehicle described in this specification is to provide an optimum level of ARFF suppression capability throughout the critical rescue and firefighting access area. Vehicles complying with this specification must meet the ARFF vehicle requirements of FAR Part 139. However, it is also intended that this vehicle be suitable for other fire protection assignments.

Scope:
This specification covers an Aircraft Fire Fighting Rescue 8x8 vehicle with a maximum capacity of 4500 gallons (17,034L) of water, 540 gallons (2,044L) of AFFF (Aqueous Film Forming Foam), 500 pound (227 kg.) dry chemical system, 460 pound (209 kg.) Halotron clean agent system, a mechanically driven water pump, a multi agent roof turret and a multi agent bumper turret. One multi agent booster hose and two water/foam handlines with variable pattern nozzles shall also be provided as described in these specifications.

- Bumper Turret: A high volume, dual flow rate bumper turret shall be provided with water and foam and entrained dry chemical powder (Williams Hydro-Chem) direct injection dry chemical capabilities. The bumper turret shall have low attack capabilities.
- Roof Turret: A high volume, dual flow rate roof turret shall be provided with water and foam and entrained dry chemical powder (Williams Hydro-Chem) direct injection dry chemical capabilities.
- Handlines:
    - One twinned booster hose shall be provided on a swing out, electric rewind hose reel with water, foam and dry chemical discharge capabilities.
    - One pre-connected handline located left side, front compartment in a tray, with tether activation shall be provided in place of cross lay hoses. Tray system shall match Denver Fire Department's Gen 1 Striker specifications, with the lower tray holding no less than 200 feet of 1 ¾" hose in an accordion load configuration, and the upper tray holding no less than 50 feet of 1 ¾" hose in a reverse-horseshoe load configuration, for a total of 250 feet of preconnected 1 ¾" hose.

- Secondary Agents:
    - A dry chemical secondary agent system is required as later defined in this specification.
    - A Halotron clean secondary agent system is required as later defined in this specification.

Safety Features:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- A warning siren with speaker shall be provided, Whelen model 295 SL. The siren shall produce a minimum sound of 95 dB (A) at 100 feet (30 m) directly in front of the vehicle and 90 dB (A) at 100 feet (30 m) and 45 degrees left and right of front center.
- Two (2) air horns (24" Hadley, Stutter tone style) shall be provided, mounted in a protected area below the level of the front bumper and activated by control button on the steering wheel. In addition to the air horns, electric horns shall also be provided. A switch to activate these horns shall be provided in a location readily accessible to the driver. A foot switch for the horn is required for the driver and the officer.
- A "vehicle backing" alarm audible up to 25 feet (7.6 m) behind the vehicle shall be provided.
- An illuminated inclinometer with Stability Dynamics LG Alert device shall be provided on the instrument panel.
- The cab roof shall include a hatch with hinged cover, a weather-tight seal and easy opening hardware to allow access from the inside of the cab to the top of the cab roof. The dimensions should be at least 32.5 inches (82.5 cm) wide and 34.5 inches (87.6 cm) tall.
- A non-skid diamond tread covering with shall be installed on the top of the vehicle's center body.

Maintainability:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle design shall be such that:

- Maintenance is achieved with general-purpose mechanic tools and equipment.
- Air tank drains will be located below the compartment openings on the left side of the vehicle.
- The engine enclosure shall be designed to access to the engines, cooling, and electrical systems via roll up shutter style doors located at the left and right side of the vehicle and hinged door at rear for electrical components. Manufacturer will make a good faith effort to work with DIA to have easily removed access panels on the roof of engine enclosure.

Component Protection:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C

plus the following:

- All oil, hydraulic, air, water, foam concentrate, and electrical system conduits, tubing, and hoses shall be in protected positions.
- Damage to the radiator, charge air and hydraulic oil coolers that could occur from brush, stones or other foreign objects shall be minimized by mounting these components in protected locations.
- All air reservoirs shall also be mounted within the chassis frame to minimize the potential of damage by foreign objects.
- A mud flap shall be provided at each wheel well position to reduce the damage from stones, brush, etc. being thrown off by the tires.
- All exposed electrical connections that are not weather or waterproof connections shall be coated with an RTV industrial silicone. The preferred coating is NovaGard 200 Series, color black.
- All compartments shall have “do not drill” emblems to ensure the water tank is not damaged while maintaining the vehicle.

Painting:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- All aluminum components shall be pre-treated prior to paint using an aluminum conversion coating process.
- All parts of the vehicle shall be cleaned, treated and primed prior to assembly and final painting with single color acrylic urethane to include wheels. Chassis shall be standard non-fade black.
- The interior of all compartments and cab shall be painted with a grey/white splatter finish.
- Lettering, logos and striping shall be provided in accordance with customer requirements, closely matching the model year 2019 Class 5 aircraft rescue firefighting vehicles currently in DEN fleet.
- The vehicle shall be painted “safety lime yellow” and lettered in accordance with the marking and lighting standards of Advisory Circular No. 150/5210-5D. The wheel rims shall be painted “safety lime yellow”. The chassis shall be painted black. Actual details for lettering will be determined prior to vehicle completion.
- Chevrons shall be applied to the front fascia and rear of the truck. The material shall be 3M Diamond Grade DG^3 reflective sheeting. Colors shall be “Solid Red 983-72” and “Fluorescent Yellow 983-23”.
- Doors shall have reflective striping so to be visible when the doors are opened. The material shall be 3M Diamond Grade DG^3 reflective sheeting, color shall be “Fluorescent Yellow 983-23”.
- Per AC 150/5210-5D lettering, numbers and graphics shall be provided in 3M Scotchlite color blue on both sides of the vehicle, centered as best as possible, sized to fit the available space. A set of numbers (6 double sided roof and 12 double-sided body side) shall be on sheets of removable, body colored metal. Numbers will be 1-12 and shall have sequential numbers on each side of the panel. The numerals shall be red or blue as determined by DEN airport. An

additional vehicle number emblem shall be permanently affixed to the front fascia of the vehicle below the bumper and the rear of the vehicle, the actual number to be determined by DEN.

Insulation, Air Conditioning and Heating:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- Acoustic and Thermal insulation shall be fire and water resistant.
- A 41,300 BTU/hr air conditioning (HFC 134A refrigerant) system, integral with the vehicle heater defroster unit shall be provided with compressor driven from the vehicle engine.
- A 85,500 BTU/hr heating system shall be provided.

Materials:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
Dissimilar metals shall not be used. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or on exposure to heat shall not be used. The use of proven, non-metallic materials in lieu of metal is permitted to reduce weight, lower cost or lessen maintenance.

Winterization:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
A -40° F winterization system is required. The winterization system shall be of the hot liquid re-circulating type with the heat being produced from a diesel fuel fired heater. It shall be capable of protecting the piping system from freezing at -40° F. Along with protecting the piping system, additional heating shall be provided in compartments that are less than 72 inches above the ground that are intended for rescue equipment storage. The temperature in these equipment storage compartments shall be maintained at a minimum of +40° F with the winterization system in operation.

Balances and Clearances:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The weight shall be distributed as equally as practical over the axles and tires. 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.

- Approach & Departure Angles: 30 degrees
- Inter-axle Clearance Angle: 12 degrees
- Underbody Clearance: 22 inches (558 mm)
- Under-axle Clearance at Differential Housing Bowl: 16.5 inches (419 mm)
- Wall-to-Wall Turning Diameter w/ rear steering axle: 100 feet (30.48 m) (requires TAK-4 independent suspension system)

Dimensions
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C.

Load Rating:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The functional load rating of the frame shall equal or exceed the actual gross vehicle weight (GVW)
- Front Tandem Axle Rating: 62,000 lbs. (28,123 kg)
- Rear Tandem Axle Rating: 62,000 lbs. (28,123 kg)
- GVWR: 124,000 lbs. (56,246 kg)

BODY COMPONENTS

Compartments:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The compartments shall be weather-tight, vented, drained to allow collected water to run out under the vehicle and equipped with roller shutter type doors.
- Each compartment shall be provided with weatherproof lights that are switched to automatically light when compartment doors are open with vehicle master switch “On”.
- Each compartment shall be equipped with an indicator light in the cab and audible signal to advise when the door is open.
- All compartment floors and shelves shall include extruded rubber matting.
- Two (2) large roll-out adjustable shelf RH lower rear compartment
- Aluminum pegboard for the storage of tools shall be placed in the right front and rear compartments.
- Provisions shall be included to store two (2) SCBA bottles in the right rear compartment, located under the shelves side-by-side.
- Compartments shall have permanently affixed labels that states, “DO NOT DRILL”, so to protect the water and foam tank from unintended damage.

Handrails:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
Extruded aluminum slip-resistant handrails or a guardrail shall be provided at all steps, walkways, and elevated workstations.

Running Boards, Steps, Walkways and Towing Devices:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
Running boards, step surfaces, ladder rungs, walkways, and catwalks shall have antiskid treads. The height between steps shall be less than 20 inches (500 mm). The

lower steps shall be less than 24 inches (600 mm) from the ground. If the lower most step extends below the approach or departure angle it must be designed to swing clear. A ladder with grab rails shall be provided on the rear of the vehicle providing access to the top. The ladder shall be fabricated of knurled or grippy aluminum material and shall be hinged to fold into a secure, stored position. Two (2) towing hooks / eyes with shackles shall be attached directly to the frame rails at the front and rear of the vehicle. Aluminum steel scuff plates shall be installed on bottom lip of all compartments.

CAB AND ACCESSORIES

Crew Space:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
All crew space shall be restricted to the interior of a fully enclosed 275 cubic foot (7.8 cubic meters) cab with approved 3-point integral restraints as minimum seat belts. The cab can accommodate seating for up to 3 (three) fire fighters.

The chassis cab shall be designed for a center driver position. The cab shall be fabricated of aluminum components and shall have aluminum and fiberglass exterior panels. The cab shall have a minimum internal volume of 275 cubic feet. The cab shall have these features;

- Center driver position
- Center control console
- Dash console in front of driver position
- Integrated electronic control and diagnostic systems
- Grab handles at each door for safe three-point entry and exit
- Interior coating shall be a durable spackle finish, primary color gray
- Conventional sun visors located above the windshield
- (2) additional roller type sun visors shall be provided above the windshield
- Cup holders integrated into the dash, two total one left one right
- Roof hatch with two latches, gas strut assist

The cab shall have a rubber floor mat covering the interior floor. The floor mat shall have a padding to provide cushioning effect and dampen noise. Portions of the cab shall be covered with a vinyl material to dampen noise. The cab shall have five sun visors.

The vehicle cab shall be equipped with (2) 8" (203 mm) x 17" (431 mm) combination flat and convex mirrors, one located on each side of the cab. The mirrors shall be electrically heated and shall be adjustable. The horizontal rotational viewing range shall be no less than 60 degrees. Electrical switches for the mirror adjustment and heating feature shall be provided within easy reach of the driver.

Cab Features;

- 3-point mounted, constructed of welded aluminum extrusions and plates to

provide the best strength to weight ratio and prevent cab collapse in the event of a vehicle rollover.

- Have gutters of sufficient size to prevent foam and water from dripping on the windshield and side windows during turret operations. The cab shall be equipped with a windshield deluge system.
- Have a single door located on each side that opens at least to a 90-degree angle with electrically operated door windows. Each door shall open a minimum of 90º and be provided with one (1) door strap (heavy duty door stops/checks). No top mounted mirrors on door required.
- Have a single piece laminated or tempered and tinted safety glass windshield.
- Have minimum of 84 sq. ft. (7.8 sq. m) of glass area.
- Have a center steering position with a lateral field of vision of at least 280 degrees (140 degrees left and right of center), with 90 degrees upward and 25 degrees downward visibility and ground visibility to the driver at a point as least 15 feet (4.5 m) and beyond from the vehicle.
- Be equipped with a center console to house the turret controls, radio equipment and siren and mounted to allow the driver or turret operator access to the controls from either side.
- Be weather-tight, acoustically and thermally insulated to provide noise level not to exceed 85 dB (A) at the driver's ear position.
- Three (3) seats shall be provided, each with an integral, red 3-point seat belt.
- The driver's seat shall be a Seats, Inc. hard backed type capable of 3-way adjustment with air ride suspension. Height, forward/aft and seatback angle shall be adjustable.
- The turret operator's seat to the right of the driver shall be SCBA type. Height, forward/aft shall be adjustable. The SCBA bracket shall be Smart Dock type to fit 45-minute, 5,500 psi Scott bottles.
- A fixed seat mounted to the left rear of the driver shall be a SCBA type. The SCBA shall be Smart Dock type to fit 45-minute, 5,500 psi Scott bottles.
- Seating and seat belts shall be certified compliant to FMVSS 207 and FMVSS 210.
- A fabricated aluminum step assembly shall be located under the roof hatch. It shall be painted to match the cab interior.
- Have heated and power adjustable rearview mirrors with flat glass area of at least 60 sq. in. (385 sq. cm) and wide-angle convex area of 7 sq. in. (45 sq. cm) mounted on each side of the vehicle.
- All dash mounted switches shall be weatherproof illuminated rocker type switches with the legend for the function of the switch embossed into the illuminated area on the switch.
- Additional English language labels shall be provided for all switches and joysticks on the dash and the center console.
- Be equipped with two (2) ceiling mounted map lights.
- Two (2) LED map lights shall be located at the center console, one (1) for the driver and one (1) for the right-side officer. These shall be on flexible stalks.
- A map box on the back of the center console shall be supplied.

- Two auxiliary air-recirculating fans shall be placed within the cab.
- A rear vision camera shall be provided to aid the driver in safely backing up the vehicle. A switch shall be provided to allow the driver to manually activate the back-up camera from within the cab. The back-up camera shall also be switched "on" automatically whenever the vehicle is in the reverse mode of operation.
- A 360-degree camera system shall be provided. The system shall include four exterior cameras. The image shall be placed in the cab LCD screen. The image shall use software to represent a view of the truck from above.
- An in cab medical storage cabinet to be provided is necessary to store medical equipment as well as resource materials. A storage cabinet with a roller shutter door and three (3) height adjustable shelves shall be installed to the rear of the center console. LED strip lighting shall be provided on each side of the cabinet door opening. Mag switches shall be installed on the sides not the floor of the cabinet. This cabinet shall be approximately 22" (558 mm) wide, 39" (990 mm) high, and 18” (457 mm) deep, with a height adjustable shelf and roller door. A 110-volt power strip shall be located within the storage compartment.
- Storage area shall be provided in the cab under at the driver’s doorway.
- Storage area only no straps shall be provided in the cab at the passenger doorway in a space under the floor level.
- The cab shall be equipped with a windshield deluge system including a pump and nozzles. The switch shall be in the center of the dash.
- Three (3) Pelican 9415 LED rechargeable lanterns with individual chargers shall be mounted in the cab, two on the left side of the dash and one on the right.
- A full color high resolution, shock resistant color camera shall be fixed mounted in the cab to view toward the front of the vehicle and record into the DVR. The fixed camera is record only.
- A digital video recorder shall be provided. The DVR shall be a Safety Vision brand and model Observer 4112. This DVR shall have a built-in, solid-state drive SSD type storage. It shall accommodate up to one terabyte of data. The recorder is to be set up so that it will begin recording the video camera image when the vehicle is started. The DVR shall automatically overwrite older data on the storage drive if not cleared prior to reaching capacity. Recorder shall be secured by means so that cab occupants cannot shut the recorder off, using a lock box or other option. On this vehicle the five critical items to be recorded any time the apparatus is powered up are, 1. Tandem mounted FLIR camera 2. Tandem mounted color camera 3. Fixed in-cab color camera. 4. 360-degree camera system. Tandem color camera shall be connected to main monitor in such a manner to allow viewing of input signal identical to recorded signal. Switching shall be provided to allow selection of color or FLIR on main monitor. Default view on the secondary (right side) LCD screen during power up of apparatus will be FLIR.
- Two severe duty, double swing arm floor mount computer stands shall be installed to the right of the center console and left of the driver operator. The stands shall be a National Products RAM mount. The cradles shall be RAM Mount Universal X-Grip Cradle for 12 Inch Tablets (RAM-HOL-UN11U).

- 12-volt power shall be provided to the two Ram mounts. The power shall be provided with Kussmaul USB EZ mount plugs or equal. 2 USB ports and two plug in 12 volts supplies must be provided in the cab. Power to be on when connected to shoreline power so items can continue to charge.
- Shades to be provided at the top of windshield and above the in-cab monitors to protect from glare.

Controls:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
All instruments, warning lights and controls relative to truck operation shall be displayed to the left of the driver so that they shall be useful, convenient, and visible to the driver. All instruments, warning lights and controls relative to the firefighting system shall be displayed to the right of the driver so that they shall be useful, convenient, and visible to both the driver and the officer (turret operator). Agent activation to be clearly identified with color coded switches providing the operator immediate identification of the agents. Blue will identify water, Yellow will identify water/foam (with protection from accidental discharge that does not mimic the other switch activations), Purple will identify dry chemical and White shall identify Halotron clean agent.

The following cab mounted controls shall be provided as a minimum:

- Accelerator Pedal
- Air Conditioner Controls
- Brake Pedal
- Color Coded Dry Chemical Agent / System Activation
- Rotary Differential Lock Control
- Dome Light Switch Manual / Door Activated
- Foam proportioning system control
- Headlight Switch w/ Dimmer Control (Headlights shall function only with the master power switch “on”)
- Heater / Defroster Controls
- Horn Control
- Master Electrical Disconnect Switch (located in engine compartment)
- Panel Lights Switch with Dimmer
- Parking Brake Control
- Power Adjustable Mirror Control
- Rotary Ignition Start/Stop Switch
- Siren Switch with Microphone
- Foot pedal switches for siren and air horn for driver and officer.
- Switches for Emergency Beacon(s) / Strobe(s)
- Switches for Exterior Lights
- Tilt / Telescoping Steering Wheel Column
- Transmission Range Selector
- Rotary three position differential lock control

- Roof Turret Control
- Bumper Turret Control
- Windshield deluge
- Windshield Wiper and Washer, column mounted
- Cup Holders

Fast Start

- Remote fast start ignition switches shall be placed at the left side of the cab adjacent to the driver's door and a second remote fast start ignition switch at the left rear of the vehicle placed directly above the left rear rectangular warning light. The switches shall be color green and shall be recessed within a protective ring. To fast start the vehicle, the operator shall push the green fast start switch one time. To continue operating the now-running vehicle, the operator must enter the cab and place the dash mounted ignition switch in the "run" position. While in "fast-start" mode, prior to placing the ignition switch in the "run" position, the operator may shut off the engines from the exterior of the vehicle by "double-tapping" the green fast start switches. If the ignition is placed in "run", the vehicle shall no longer be in "fast-start" mode, and the engines can only be stopped by placing the ignition switch in the "stop" position. An audible alarm shall be present to alert the driver to the need to put the rotary switch in the "run" position.

Instruments and Warning Lights:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following

The following instruments and warning lights shall be provided in the cab:

- Center, drivers' automotive IP display shall include at minimum;
    - Fuel level gauge
    - Battery amperage gauge
    - Vehicle speedometer
    - Multipurpose (left) engine DEF level
    - Multipurpose (left) engine oil pressure
    - Multipurpose (left) engine tachometer
    - Multipurpose (left) engine coolant temperature
    - Multipurpose (left) engine transmission oil temperature
    - Multipurpose (left) engine transmission current and selected gear
    - Drive (right) engine DEF level
    - Drive (right) engine oil pressure
    - Drive (right) engine tachometer
    - Drive (right) engine coolant temperature
    - Drive (right) engine transmission oil temperature
    - Drive (right) engine transmission current and selected gear
    - Air Pressure (brake and other air-driven accessories)
    - Warning or indicator lights for;
        - Steering failure
        - Differential lock, transfer case

        - Differential lock, axle
        - Headlight bright selection
        - Driving/fog light indicator
        - Parking brake
        - Emergency flasher lights
        - ABS fault
        - Stability control
        - Engine brake/retarder
        - Multipurpose (left) engine failure
        - Multipurpose (left) engine hand throttle
        - Drive (right) engine failure
        - Power Uniter high temperature or low oil pressure
- The right dash panel shall have one LCD display screen, to be the most recent upgraded resolution. There shall be visors over the monitors to reduce glare. These monitors shall display at minimum;
    - Water pressure gauge
    - Water tank level gauge
    - Foam tank level gauge
    - Nitrogen cylinder level gauge
    - Argon cylinder level gauge
    - EFP icon/switch
    - Alarm silence icon
    - Display brightness icon
    - Fault indicator icon
    - Clean up mode icon
    - Warning icon bar with;
        - Water temperature icon with audible alarm
        - Turret fault icon
        - MADAS alert icon
        - Generator fault icon
        - Preconnect 1 icon
        - Water tank closed icon
        - Structural panel active icon
    - Warning indicator shall be in the cab to warn the occupants of;
        - Pump engaged
        - Light tower raised
    - Soft codes that do not present immediate issues with the vehicle shall not be visible to the operator, only hard codes that present significant issues shall be visible. Soft codes shall be visible only to technicians performing maintenance on the vehicle.

FLIR Component of Driver's Enhanced Vision System (DEVS):
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle shall be equipped with a Forward Looking Infrared sub-system. The system shall provide vision enhancement in low visibility conditions including operation during

total darkness, fog, severe weather, and firefighting operations during which thick smoke is emitted. The FLIR camera shall be a marine quality product, FLIR M364CLR, dual payload.

Communications and Radio Equipment Requirements:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
Dedicated 12-volt radio leads shall be provided to the dash instrument panel and marked and tagged with permanent tags.

The following communication radios and other requirements shall be installed into the vehicle;

- Two (2) Harris M7300, SYSTEM 700/800 MHz trunked, remote mount, mobile radios with external speakers, hand microphones, microphone clips, and 700/800 MHz antenna (Laird #QW800). Radios shall have maximum system groups, AES-256, Status, OTAR, and P25 Phase 2 features. One head unit to be "system" type and one head unit to be "scan" type.
- Two (2) Harris VC4000 portable radio carrier/chargers, part number CH-017231 shall be installed on the rear wall of the center console.
- One (1) Icom America IC-A220 VHF air band transceiver, TSO approved version, with external speaker, VHF antenna (Laird #QWFT120), hand microphone and clip to be provided and installed by the chassis manufacturer.
- A Setcom System 1300 headset/intercom three radio system, including all necessary cables, adapters, and interfaces, with headsets for the driver and two (2) additional crewmembers. Setcom System to have A-B TX selector switch as installed in previous Denver Apparatus. Upper M7300 in console will correspond to upper position of A-B TX switch. Lower M7300 in console to correspond with lower position of A-B TX switch. Each headset shall have a boom microphone and be interfaced with the VHF-AM aviation band and fire department radios with one ear wired for one of the above fire department radios and one ear wired for the VHF-AM radio. The driver's, turret operator, and left inner rear seat headsets shall have transmit and receive in addition to intercom capability. Left ear to be UHF and right ear to be VHF. Must have two external speakers, on for UHF and one for VHF.
- The acceptable installation provider for the communication systems in this vehicle includes Precision Installations, Inc. in Neenah, WI. The vendor shall seek approval from DEN for any other arrangements. Radios to have color coding to mark receivers. VHF Airband to be blue, UHF/DIA DFD to be red and UHF DIA OPS to be yellow.

ENGINES, DRIVELINE AND CONTROLS

Engines:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C

plus the following:
The vehicle shall be equipped with two engines. The engines shall be Scania DC16, 16.4-liter displacement, turbo charged, 4-stroke diesel type with 90-degree V8 cylinder configuration. The engines shall be US EPA Tier 4 final emissions compliant and rated at 770 BHP (574 kW) with a peak torque of 1950 ft-lb (2644 N-m). The engines shall be equipped with electronic fuel management systems. The US EPA Tier 4 final engines shall be equipped with selective catalyst reduction and exhaust gas recirculation but shall not have diesel particulate filtration to meet emission standards.

An engine high idle control shall be provided to maintain the engine idle at approximately 1450 rpm when activated. The control for this system shall be safety interlocked to activate only after the transmission has been placed in the neutral position and the parking brake has been set.

To supplement the conventional vehicle braking system, both engines shall be equipped with an engine braking system with one ON/OFF switch located in the cab dash.

Cooling System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The cooling system shall be of the circulating liquid type with a thermostatic control to maintain coolant temperature consistent with the engine manufacturer's recommendations.

The cooling system shall include:

- Belt driven sucker type cooling fans installed adjacent to the two radiators.
- Fan operation shall be automatically controlled by a system which monitors engine coolant, engine oil and intake manifold pressures.
- High performance material coolant and heater hoses
- A Hot Start immersion type electrical engine coolant preheating device (minimum 1500 W) shall be provided as an aid to rapid starting and high initial engine performance. A Kussmaul auto eject plug for shore power shall be located at the rea of the vehicle.
- Low coolant level indicator light and buzzer mounted in the cab.
- High engine coolant temperature indicator light and buzzer mounted in the cab.
- Bar and plate type radiator core with left and right-side tanks and side securely mounted. frame surrounding the core.

Exhaust System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The exhaust system shall be routed through the top of the engine enclosure and both exhaust stacks shall have an exhaust rain cap.

The vehicle shall be equipped with "Ward No Smoke 2" exhaust treatment systems, the

number and size of the unit will be determined by the manufacture. The systems shall treat and filter the vehicle's exhaust to reduce harmful particulates and gasses associated with diesel exhaust. The system shall include all associated filters, electronic control module and warning system that are recommended by Ward Diesel. One extra filter shall be provided if applicable to the "Ward No Smoke 2."

A Ward No Smoke 2 systems shall be installed on the vehicles by the system manufacturer while the vehicle is in production.

Fuel System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
There shall be two fuel tanks interconnected with one single fuel fill. The fuel tanks shall have a minimum capacity of 75 gallons (283.9 L). 150 gallons (567.8 L) total. The tanks shall have bottom drain plugs and a single filler pipe located no higher than 60 inches (152 cm) from ground level. A fuel water separator with auxiliary fuel pump for the main engine shall be provided. The auxiliary pump will be manually operated to re-prime the fuel system after replacement of fuel filter(s). Capacity label in gallons shall be installed at fuel tank. The fuel fill area shall be protected to prevent dirt and debris from entering the fuel fill.

Transmissions:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle shall have a dual engine and transmission configuration. The transmissions shall both be Allison Gen 5 Model 4850 EVS, automatic, multi-speed, electronically controlled transmissions, fully compatible and certified for use with the electronically controlled engines. The transmissions shall have a minimum of seven (7) forward and one (1) reverse speeds.

Synchronized Drive Component "Power Uniter":
The vehicle driveline shall include a synchronized drive component ("Power Uniter") which unites the power of the two diesel engines and two transmissions in the vehicle driveline system. During normal driving conditions, the Power Uniter shall transfer and distribute power from both engines to the tandem front and rear axle sets equally. During pump and roll operation the Power Uniter shall provide power from the left side, multipurpose engine and transmission to the pump. The right-side drive engine and transmission shall remain connected to the vehicle driveline for motive power. A single speed transfer case shall distribute motive power to the front and rear tandem axle sets. The Power Uniter shall have a torque transmission capacity exceeding the maximum torque developed by the engines and transmissions and shall be approved for the application and be manufactured by the chassis builder. The Digital control of the engines, transmissions, and Power Uniter system will be managed through the Oshkosh Command Zone® proprietary vehicle software and distributed over the J-1939 data bus. The Power Uniter shall have a temperature sensor with a high temperature warning icon in a dash monitor.

Axles:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The front and rear axles shall have adequate capacity to carry the fully loaded vehicle under all intended operating conditions. For vehicle handling, stability and off-runway performance, the axles shall have identical track width of 96 inches (244 cm).
- Front Tandem Axle Set – 62,000 lb. (28,123 kg) rating, double reduction (axle housing and wheel end), enclosed steering drive ends, bevel gear differential with driver operated differential lock.
- Rear Tandem Axle Set – 62,000 lb. (28,123 kg) rating, double reduction (axle housing and wheel end), and bevel gear differential with driver operated differential lock. The rear most axel shall be automatic mechanical steering axle with an average 11-degree maximum steering angle.

Air and Brake System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle shall be equipped with dual braking system including tandem front and rear brakes with an overall vehicle tread width of 120" (3,048 mm). The brakes shall be outboard disc type. The brakes shall be equipped with automatic brake adjustors, to be clutch and worm drive type. The system shall feature a dual type brake treadle valve with separate supply and delivery circuits. There shall be an electronic antilock brake system with sensors on axle one and axle four and controlled by an electronic control unit (ECU). The ECU shall monitor wheel speed during braking and modulate the brakes when excessive wheel slip or lockup is detected. There shall be provision for ABS diagnostics provided. A manual parking brake valve shall be installed in the cab within easy reach of the driver.

The air and brake system shall have the following features:

- An automatic air-drying system (Bendix AD-IS desiccant type) downstream of the compressor.
- Air brake chamber for each brake with self-adjusting mechanisms.
- Drain on all reservoirs controlled from one common location on the exterior of the vehicle.
- Visual and audible low air pressure warning device.
- All wheel anti-locking brake system (Bendix 4S-4M or equivalent) to provide safe controllable stops.
- One (1) air inlet receptacle. This receptacle shall be an auto-eject type and located at the rear of the vehicle to allow charging with shop air.
- The air system shall be supplied with an on-board auxiliary air compressor, electric motor driven, to maintain the vehicle's air system at a working pressure between 80 to 100 psi.
- An air hose reel shall be mounted in an upper compartment on the left side of the

vehicle, including 150 feet (4,572 mm) of 3/8-inch (9.525 mm) I.D. hose.
- An auxiliary air compressor shall be provided with a Kussmaul auto eject shore power plug at the rear of the vehicle.

Steering:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The chassis shall be equipped with power assisted front tandem axle steering that shall permit manual steering to bring the fully loaded vehicle to a safe stop in the event of power assist failure. For TAK-4 independent suspension system configured vehicles, the rear tandem axle set shall have a steering option, wherein the rear most axle shall steer a percentage of the front tandem axles. When steering the rear axle to full angle, the toe in shall be minimum 12º and toe out shall be minimum 10º. The rear steer system shall be mechanical type with a physical driveline and shall utilize the same power steering pump as front steering axles. A tilt / telescoping steering wheel shall be provided. The vehicle shall be capable of a wall to wall turning circle under 100 feet.

Suspension:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
- An off-road high mobility all-wheel independent suspension (TAK-4 or equivalent) shall be provided for enhanced ride comfort, cornering and roll stability. The design shall allow the vehicle to travel safely at minimum off-road speeds of 35 mph (56 kph). The suspension design shall allow for a minimum of 16 inches (406 mm) of total wheel travel.
- Upper and lower control arms shall be used on each side of each axle.
- Each axle shall be equipped with an anti-roll bar for increased cornering stability.
- Steering and non-steering axles shall have a tie rod that is adjustable for alignment of the wheel to the center of the chassis.
- Each wheel shall have at least one coil spring and heavy-duty dual acting shock absorber.

Chassis Frame:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle frame shall be designed to provide the required strength and torsional rigidity. The chassis frame rail shall be high strength alloy steel with minimum yield strength of 80,000 psi (551,500 kPa) and section modulus of 49.4 in^3 (809 cm^3). The main frame rails shall be rectangular tube type with minimum dimensions of 12 inches (305 mm) by 4 inches (102 mm) with minimum .47-inch (12 mm) wall thickness. Frames must use bolted-in cross members with class 10.9 metric fasteners. Minimum width to the outside of the main frame rails in an assembled chassis shall be 36 inches (914 mm). The vehicle frame, suspension, and mounting of major components shall provide for diagonally opposite wheel motion up to 14 inches (360 mm) above the ground without raising the remaining wheels from the ground or causing interference. Integrity

and longevity of the main frame rails shall not be compromised by any welding of bracketry, suspension parts, or reinforcements. Tow eyes and shackles shall be provided for the front and the rear of the vehicle.

Ride Quality:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
All wheel independent suspension to provide superior ride quality for safe operation and improved off road capability over rough roads and adverse terrain at speeds of at least 35 mph (56 KPH) without causing injury to the operating personnel, loss of vehicle control, or damage to the vehicle.

Wheel and Tire Assembly:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The wheels shall be single disc type with all to be of identical offset, bolt patterns, and size, and must be completely interchangeable for permanent use between front and rear axles. The tires shall be Michelin 24R21 XZL steel belted radials. One (1) spare tire and wheel/rim assembly, mounted, shall be provided. The wheel/rim assembly shall be painted to match the other wheel/rim assemblies on the vehicle.

Lubrication:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The engines, transmissions and chassis lubricating systems shall be the manufacturer's current standard. The engines, transmissions, and synchronized drive component oil filters shall be of the full-flow type with spin-on or cartridge type replaceable filter elements.

The vehicle shall be equipped with an automatic lubrication system. The system shall include reservoir, pump, valves and lines necessary to lubricate applicable chassis and auxiliary components.

ELECTRICAL SYSTEM

Lighting and Marking System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

The system shall include the following:

- Four (4) LED headlights for upper and lower driving beam
- One (1) LED light mounted on the roof turret
- One (1) LED light mounted on the bumper turret
- Turn signals, front and rear, with self-canceling control; a visual as well as audible indicator; and four-way flasher switch

- Reflectors, markers, and clearance lights meeting all applicable FMVSS
- Non-glare type engine compartment LED lights to illuminate both sides of the engine and with switches(s) located in the engine compartment
- Non-glare type compartment LED lights to illuminate the inside of all storage, maintenance access, engine, and piping compartments
- Four (4) 24 VDC scene lights shall be provided on each side of the vehicle. The lights shall be white LED type with clear lenses and shall be surface mounted. The lights shall be 30” length Rigid Industries E Series LED lights.
- Two (2) 10” length Rigid Industries E -Series LED lights shall be mounted at the front brow of the vehicle cab to illuminate the area in front of the vehicle. These lights shall be equipped with glare shields.
- Two (2) 10” length Rigid Industries E -Series LED lights shall be mounted at the rear of the vehicle on the engine enclosure to illuminate the area behind the vehicle and supplement the standard backup lights. These lights shall be automatically switched “on” when the vehicle is placed in reverse
- In addition to the normal vehicle headlights, two (2) LED driving lights shall be mounted below the front bumper
- In addition to the normal vehicle headlights, two (2) LED fog lights shall be mounted below the front bumper.
- LED lighting for the cab steps and ladder shall be provided.
- LED ground lighting shall be provided, to be available with the vehicle in neutral and parking brake applied.
- One (1) compact LED light shall be provided on each side to illuminate the number panels.
- Emergency Lighting;
    - Two (2) Whelen Mini Edge Ultra Freedom red warning light bars shall be mounted on the vehicle top front center body section and two (2) at the rear (four total) as required to be visible from the sides, front, and rear of the vehicle.
    - Ten (10) red, rectangular Whelen LED warning lights shall be placed on the lower perimeter of the vehicle, three (3) per side and two (2) each at the front and the rear.
- Non-Emergency Lighting - Two (2) amber LED lights shall be mounted on top of the vehicle AOA lighting shall come on when vehicle ignition is activated, extinguish when emergency lighting is activated, and reactivate when emergency lighting is extinguished, no manual control of AOA lighting present.

Power Supplies:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
A 24-volt electrical system shall be provided. The vehicle power shall be supplied by dual alternator systems, each engine with two (2) 100-amp alternators, engine providing backup if one should fail. Both alternators shall be driven by the same drive belt. A warning system shall be provided to indicate an alternator failure.

The electrical system shall have the following:

- Four (4) Group 31, 12 Volt Maintenance Free Batteries with 950 CCA @ 0-degree F (each)
- A remote voltmeter shall be installed adjacent to the batteries to read the battery charge.
- A switch shall be mounted in the engine compartment that shall prevent the vehicle from being started from the cab during routine maintenance.
- An on-board 24V battery charger male polarized auto-eject type receptacle suitable for receiving 110-volt AC outside electrical supply will be mounted at the rear of the vehicle. The battery charger shall be programmed to stay active at all times and not go into standby mode.
- Lockable total vehicle master disconnect switch rated for full vehicle current

Starter:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

A Scania 24 Volt 6.5 KW or equivalent electric starting system shall be provided.

Wiring:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

All wiring shall be number coded to match a number coded electrical schematic. Standard quick disconnect plugs shall be provided throughout for ease of maintenance in removing components in the event of system damage. Wires shall be insulated in accordance with SAE standards. Each engine to have J1939 connector for the ECM.

Generator System:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

A 10.0 KW (minimum capacity), 110/240 VAC, 60hz hydraulically powered generator, shall be mounted on the vehicle in an enclosed compartment. The generator shall be in-cab remote start/stop controlled and have a light that shall indicate when it is running. The generator shall be equipped with a system that shall shut down the unit in event a malfunction within the electrical system. The hydraulic hoses shall be adequately protected where exposed especially outside the compartmentation where weather and road material may be encountered.

The following shall be powered by the on-board generator, low voltage switch controlled, for safety purposes;

- A Will-Burt Nightscan 4.5 telescoping light tower shall be mounted on the vehicle's roof. The light tower shall have six (6) Whelen Pioneer Plus light heads with spot and flood light sections. The lights shall be 120 VAC for use with the vehicle on board generator. The lighting system shall be controlled from a handheld remote-control device with 25 ft. of cable, which can be operated either

from the cab or outside the vehicle. Mounting provisions shall be provided to secure the remote control and cable inside the cab in a manner that the driver can operate the control from a seated position but can be easily removed for remote operation outside the vehicle on either side.

- Two (2) 110 VAC straight blade receptacles shall be mounted in the lower compartments, one (1) on each side of the vehicle complete with weatherproof hinged covers.
- An electric cord reel shall be provided with 200 feet (6,096 mm) of 12/3 SO safety yellow cord. This cord reel shall be wired through a 20-amp circuit breaker and receive its power from the generator. The receptacle at the end of the cord shall conform to NEMA L5-20R. The reel shall be mounted in an upper left compartment on the vehicle. The cord reel shall be equipped with a 24 VDC electric rewind motor with the rewind switch be mounted adjacent to the cord reel. A tension device is not required, but a means to prevent the cord reel from unreeling in the stored position must be provided. A roller system shall be provided to allow for deployment of the cord from the reel without chafing. A junction box with an indicator light and four connections (two twist and two straight blade) shall be provided at the end of the cord.

AUTOMOTIVE PERFORMANCE

Acceleration:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle shall be capable of 0-50 mph (0-80 km/hr) acceleration time of 25 seconds depending on configured options at Denver, Colorado altitude.

Brake System:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E.

Dynamic and Static Stability:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C. plus the following

The vehicle shall meet the following stability requirements:

- Side Slope Stability (Tilt Table Meeting SAE J2180): 30 degrees (58 percent grade)
- Dynamic Balance (Min. Speed on 100-ft. (30m) Radius Circle): 22 mph (35 kph)

Environmental Conditions:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C.

Grade Ability:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C.

Top Speed:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The vehicle shall be capable of a top speed of 80 mph depending on the configured options.

Off-Road High Mobility Suspensions:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
An off-road, high mobility All-Wheel Independent Suspension System (Oshkosh TAK-4 or equivalent) shall be provided resulting in no more than 0.5 g rms acceleration at the seat of the vehicle when traversing an 8-inch (24 cm) half round at 35 mph (56 kph).

FIRE EXTINGUISHING SYSTEMS

DRY CHEMICAL SYSTEM:
Agent Container and Components:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

A 500 pound (227 kg) dry chemical system (Ansul or equivalent) shall be provided capable of holding a potassium-based dry chemical fire-extinguishing agent. The container shall be constructed and stamped in accordance with ASME Code for Unfired Pressure Vessels.

A quick acting agent system activation control shall be accessible to the seated driver and at least one other crew position. A similar control shall be located near the agent handline.

Pressure gauges shall be in the center console right side monitor so that, when the system is activated, they shall allow the vehicle operator to determine the propellant reservoir status as well as the system operating pressure. There shall be provisions for purging agent from all piping and hose after use without discharging the remaining chemical.

Agent Delivery Piping and Valves:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The installed discharge piping shall be tested at a pressure equal to 150 percent of the system working pressure.

Propellant, Propellant Containers and Components:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The propellant gas shall be nitrogen. All propellant gas cylinders and valves shall comply with United States Department of Transportation (DOT) requirements. A remote gauge shall be provided.

The handline for dry chemical shall be a side mounted swing-out hose reel equipped with 100 ft. of one-inch dual agent twinned type booster hose. This handline shall be provided and mounted in the right front center body compartment to provide deployment of the hose to the right side and/or front of the vehicle. The hose reel shall be equipped with a 24 VDC electric rewind motor with manual rewind provisions and a tension device to prevent the unreeling of the hose. The nozzle shall be a Williams Hydro-Chem capable of discharging 60 gpm foam/water and 5 lbs. per second of dry chemical in accordance with the performance requirements of the A/C. Controls at the handline shall allow charging of the nitrogen into the dry chemical tanks and charging of the dry chemical into the handline.

Other Requirements Include;

- The nitrogen bottle shall be stored vertically in a side compartment. The bottle shall be secured in a stowing cradle. The cradle shall be lifted for installation or removal via an onboard electric hoist with pendant style of controller.
- One (1) spare nitrogen cylinder mounting bracket shall be provided with its‘ own stowing cradle.
- Each nitrogen bottle shall be equipped with an integral pressure gauge on each bottle so crew members can easily determine the state of charge when the bottle(s) are in storage.
- A secondary remote mounted gas gauge shall be placed in the compartment adjacent to the nitrogen bottles so the bottle pressure can be seen from ground outside vehicle.
- The nitrogen bottle shall be placed outside, the argon bottle shall be placed inside. A remote gauge shall be provide.
- 1,000 pounds of purple K dry chemical shall be provided.

Halotron Clean Agent System, including Agent Container and Components, Agent Delivery Piping and Valves and Propellant Containers and Components:

- The vehicle shall be supplied with a 460-pound Halotron I system. Dash mounted controls shall be provided to charge the Halotron system. A means shall be provided that will indicate the capacity of the agent in the storage vessel.
- The handline for Halotron I shall be 150 ft. of one-inch type booster hose on a hose reel in an upper compartment on the right side of the vehicle. The hose reel shall be equipped with a 24 VDC electric rewind motor with manual rewind provisions. A tension device should be installed to prevent the unreeling of the hose. This handline shall be so installed to provide deployment of the hose from the right-hand side of the vehicle. The nozzle shall discharge 5 lbs. per second of Halotron in accordance with the performance requirements of the A/C. Charging of this handline shall be conveniently done by controls mounted alongside the hose reel.
- There shall be provisions to service the Halotron agent from ground level. The Halotron fill valve shall be positioned so that when closed, the valve handle is horizontal and when open be placed vertically. A valve must be installed on tank

to allow easy offloading in the event of a system failure.

- 1,000 pounds of Halotron I, and a re-servicing kit shall be provided.
- One (1) complete set of fully charged Argon bottle(s) shall be supplied, to include a spare bottle for re-servicing. This quantity of Argon provided shall be such that it will provide a complete discharge of the Halotron agent plus perform a blow-down operation.
- Each Argon bottle shall be equipped with an integral pressure gauge on each bottle, so crew members can easily determine the state of charge when the cylinders are in storage.
- A remote gauge shall be placed in the compartment adjacent to the argon bottle storage so the bottle pressure can be seen from ground outside vehicle.
- Each argon bottle shall have its' own stowing cradle.
- The argon bottle shall be stowed on the truck inside, nitrogen outside.

FOAM CONCENTRATE SYSTEM:

Concentrate Proportioning

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

An electronic foam proportioning system shall be provided. The system shall provide settings for 1, 3, 6 or 8% foam proportion. Selection shall be available on the dash with a single switch.

Foam Proportion Testing System

The vehicle shall have an onboard system to monitor foam proportion and maintain digital history with date stamp for reporting purposes. Foam percentage shall be measure actual solution flow for each discharge on the vehicle using only water. The system shall provide ability to use the vehicle VIN as file identifier for downloading and sorting.

Concentrate Reservoir and Piping:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The foam liquid concentrate tank shall have a minimum usable capacity of 540 gallons (2,044 Liters) and be constructed of UV stabilized polypropylene. The tank shall be integral part of the water tank.
- Provisions shall be made for access for internal and external inspection and service as may be recommended or required by the vehicle or tank manufacturer. Reservoirs, large enough to require baffles, shall be provided with access to each baffled compartment.
- The reservoir shall be fitted with a sump, complete with anti-swirl baffles, and a 1-1/2-inch minimum diameter drain with a valve and an accessible control. The drain shall be fitted with 1-1/2-inch NSFHT connection with a chrome cap and chain. The drain shall not terminate under the vehicle.
- The reservoir outlet shall be located above the bottom of the sump and shall

permit a continuous flow of foam concentrate to the proportioning system with the system designed to support all discharge requirements.

- A shutoff valve shall be located at the reservoir that can be closed and locked out during maintenance to prevent accidental loss of foam.
- The reservoir shall be vented to permit the required fill rate without exceeding the design working pressure and to permit emptying at the maximum design flow rate without danger of collapse. The vent outlet shall be directed to prevent spillage of foam concentrate on vehicle components.
- A foam tank sump drain shall be installed separate from the foam tank drain if a sump is included in the bidder's standard tank design.
- The fill system shall be capable of delivering foam concentrate to the reservoir at a rate at least equal to the maximum use rate of the foam proportioning system.
- One (1) 1-1/2-inch NSFHT foam tank fill connection shall be provided on the left side of the vehicle. The inlet shall be fitted with a stainless-steel strainer of 1/4 inch mesh and shall have check valves or be so constructed that no more than 1/4 gal of foam is lost from the reservoir during connection or disconnection of the foam re-supply line. The tank fill shall have cam lock cap.
- The foam tank drains shall have ¼ turn valves that shall be able to lock to prevent inadvertent opening of valve and releasing foam concentrate.
- The foam fills and drains shall be inside the compartments not below.
- An audible alarm shall activate in the cab when the foam level in the foam tank drops below 25%. A dash switch shall silence the low-level alarm.
- A top fill opening shall be provided which shall be equipped with a No. 10 gauge mesh, corrosion resistant stainless steel or equal screen. The fill line from the trough shall introduce foam concentrate into the reservoir to minimize foaming.
- The foam concentrate piping shall be sized to permit the flow rates needed to meet the agent discharge requirements of all discharges and shall be arranged to prevent water from entering the foam reservoir.
- The foam concentrate piping shall be so arranged that the entire system, including any foam concentrate pumps, can be flushed with water from the water tank without contaminating the foam reservoir.
- Two (2) external foam tank level indicators shall be provided one on each side of the vehicle integrated into the tank side of the vehicle. Each indicator shall have four (4) lights, three (3) amber and one (1) red. The lights shall turn off at ¼ intervals as the foam tank level falls. These lights shall always come on with the ignition switch on.
- An onboard pneumatic foam transfer pump shall be provided, located in the left rear compartment.
- 550 gallons of firefighting foam are required. Between the date of purchase and the date of completion and final vehicle inspection, regulatory or other factors may affect the type and brand of firefighting foam required. Therefore, the airport shall provide the manufacturer with their foam selection six weeks prior to the final inspection. The airport currently uses Mil Spec 3% AFFF foam, either Chemguard mil spec C6 chain – Chemguard C306 MS C 3% AFFF.

Water Piping, Couplings, Connections and Valves:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The installed discharge piping shall be tested at a pressure equal to 150 percent of the system working pressure.
- A drainage system, with collector tubing from the low points on the pump and piping shall be provided.
- The water system piping shall be constructed of stainless steel or corrosion resistant materials.

Water Pump and Pump Drive
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

The vehicle shall be equipped with a water pump. The water pump shall be a single stage design that meets all requirements of ICAO, NFPA 414 as well as FAA Advisory Circular 150/5220/10E. The pump shall have a rated capacity of at least 1,950 U.S. gallons per minute at an operating pressure of 225 PSI with suction vacuum at the manifold inlet of 9 IN-Hg. The pump shall have an integrated chain drive ratio box with a ratio of 1:1.06. The pump gearbox shall be driven by a driveline from the truck power uniter. The pump and pump transmission shall have the ability to run continuously without overheat issues in ambient temperatures up 110 degrees Fahrenheit. The pump body shall be vertically split on a single plane for easy removal of the entire impellor assembly including the bronze wear rings. The pump shall be constructed of the following materials;

- Impeller: silicon brass UNS C87500
- Pump body: bronze
- Transmission: aluminum alloy
- Transmission seals: nitrile lip seals
- Transmission input shaft: stainless steel

The pump body and gearbox shall be painted in a durable red primer. The entire pump shall be bench tested at the original manufacturer to include 400 PSI pressure test and capacity test. A test certificate shall be provided with the vehicle.

The pump discharge pressure shall be regulated by means of a “Pressure Governor”. The pressure control systems must be automatically controlled via computer/electronic settings, to provide precise control of the engine speed and pump discharge pressure. The system must insure that the flow of water/agent is remain constant regardless of the number of outlets that are opened and shut.

A means shall be provided to automatically prevent the agent pump from overheating while engaged and operating at zero discharge through the installation of a thermal dump line.

Water Reservoir and Piping:

Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:
The water reservoir requirements and features shall include:

- A minimum usable capacity of 4,500 gallons (17,034L)
- Constructed of UV stabilized polypropylene.
- Sufficient longitudinal and transverse baffles shall be included to assure stability.
- Removable manhole covers, plates, or removable tops to permit access to the sump.
- Fitted with a sump, complete with antiswirl baffles, a 2-1/2-inch low point drain, and a quarter-turn valve which has a handle accessible with a gloved hand.
- A top-fill opening diameter of at least 10 inches, a screen with maximum 1/4-inch mesh and a gasketed, latchable cap. Where practical all metal, hinges, covers, and handles shall be of stainless steel.
- Be vented to permit filling and overfilling and discharging in accordance with the A/C and 414 without exceeding the design operating pressure or causing the reservoir to collapse. Overflow shall be directed to the ground and away from the fill piping connections and vehicle components. Any restrictions in filling pressures shall be submitted in proposal and if approved, labels shall be installed at each fill station to indicate maximum fill pressure.
- The discharge piping shall be sized to allow sufficient water to the pump for the simultaneous operation of all turrets, ground sweeps, Handlines and under truck nozzles, at the applicable discharge rates specified.
- The fill piping and connections shall be sized to permit filling in no more than two (2) minutes when the supply source provides sufficient volume at 80 psi (5.5 bar) at the reservoir fill connection, in addition to:
- Two (2) 4-1/2-inch NH inch fill connections shall be provided, one on each side of the vehicle. Each connection shall be provided with a protective strainer and fitted with a 5” Storz coupling and cap.
- Two (2) 2-1/2-inch NH fill connections shall be installed, one on each side of the vehicle. Each connection shall be provided with a protective strainer and fitted with a rocker lug cap and chain.
- Quarter turn valves shall have a label affixed to the valve or nearby showing the “OPEN” and “CLOSED” position of the valve.
- Any standing water in the fill connection manifold shall be drained by bleeder valves.
- Both fill stations shall be fitted with 2-1/2 or 3-inch liquid filled pressure gauges. The proper designed fill pressure must be posted.
- All connections, discharges, inlets, drains, gauges etc. must be labeled.
- All inlets and outlets shall be equipped with screens to protect from foreign objects and to provide cathodic protection.
- An audible alarm shall activate in the cab when the water level in the water tank drops below 25%. A dash switch shall silence the low-level alarm.
- Two (2) external water tank level indicators shall be provided, with one (1) mounted on each side of the vehicle integrated into the tank side body panel. Each indicator shall have four (4) lights, three (3) blue and one (1) red. The lights

shall turn off at ¼ intervals as the water tank level falls. These lights shall always come on with the ignition power switch on.

Water Discharges and Connections
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following
A structural firefighting system is not required. The water fill and connections shall include with the following:

- One 5-inch (127 mm) water fill with 5-inch Storz connector and cap and chain shall be provided on the left side of the vehicle and one 2.5-inch (64 mm) pump fill inlet on the left side of the vehicle.
- Four (4) gated 2.5-inch (64 mm) non-regulated discharge connections (two on each side) shall be provided. Each connection shall be angled downward, provided with a cap and chain, and be equipped with a liquid filled, 2.50-inch gauge.

HANDLINES, REELS, AND COMPARTMENTS

Handlines:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

- The vehicle shall be configured to accommodate two (2) handlines. Hose is not required, but nozzles are required.
- Nozzles shall be provided, to be Akron Assault, color green. The nozzles shall be pistol grip, metal bail with NPSH thread and 1-1/2" swivel.
- Each hand line shall accommodate 250 feet of 1-3/4 hose in 50-foot lengths. The hand lines shall be able to produce foam or water at a 125-gpm rate at 100 psi.
- The hose to pipe connections shall have NPSH thread adaptors.
- A toggle switch shall be provided to activate each hand line. An amber switch shall indicate the hose is activated.
- When the hose is fully deployed from the hose tray, a tether system shall be activated to engage flow to the hose and nozzle.
- Agent override switches shall be provided for all hand lines to allow an operator to manually by-pass the flow switches to trigger the vehicle to go to operating pressures for the hand lines.

TURRETS AND UNDERTRUCK NOZZLES

Bumper Turret:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following:

The bumper turret shall be a multi-position, high volume, low attack type with a Hydro-Chem non-aspirating direct injection nozzle, mounted at the front of the vehicle. The turret and nozzle assembly shall include the following design features:

- The nozzle shall have a variable pattern control and have an automatic flow mechanism to maintain consistent pressure. The nozzle shall maintain a constant flow at either discharge rate whether in the straight stream or fully dispersed (fog) pattern. The nozzle shall be a non-aspirating type with 24-volt powered electric pattern actuation for straight stream or fog pattern selection. The nozzle shall meet or exceed all performance requirements for a primary turret as defined in the AC and NFPA 414.
- The nozzle shall be Hydro-Chem non-aspirating direct injection type, capable of water/foam flow discharge rates of either 625 or 1250 GPM with a dry chemical discharge rate of 16 pounds per second. The turret assembly shall be equipped with an automatic leveling device to keep the nozzle parallel to the ground regardless of the position of the lowering mechanism.
- An electronic joystick control shall be provided with integrated controls for discharge activation, selection of agent type, and discharge rates and patterns from straight stream to fully dispersed (fog pattern). The left switch to activate straight stream and right to be fog.
- When initially actuated, the nozzle shall deploy to a position aligned horizontally and vertically with the vehicle.
- The turret shall be an Elkhart Brass Scorpion. The turret shall be high-flow, electric motor driven and shall be adequately reinforced to sustain all anticipated loads and reaction forces when the nozzle is discharging. Each axis of travel shall feature double race bearings. The waterway shall be Teflon impregnated and be a hard-anodized aluminum alloy. The electric motors for horizonal and vertical travel shall be sealed, high-torque type and shall utilize sealed planetary gearboxes. There shall be fully proportional speed control. There shall be absolute position sensors. All electronics shall be fully potted. There shall be provisions for manual override in the event of an electrical failure, for both vertical and horizontal axis.
- The turret shall be capable of being lowered from its stored position near bumper height to a point where the centerline of the nozzle shall be approximately 24” above the ground. The turret and its lowering mechanism shall be stored in a position providing minimum protrusion from the front of the vehicle while maintaining a 30° angle of approach.

Roof Turret:

The roof turret shall be a multi-position, high volume type with a Hydro-Chem non-aspirating direct injection nozzle, mounted on the front roof of the vehicle. The turret and nozzle assembly shall include the following design features:

- The nozzle shall have a variable pattern control and have an automatic flow mechanism to maintain consistent pressure. The nozzle shall maintain a constant flow at either discharge rate whether in the straight stream or fully dispersed (fog) pattern. The nozzle shall be a non-aspirating type with 24-volt powered electric pattern actuation for straight stream or fog pattern selection. The nozzle shall meet or exceed all performance requirements for a primary turret as defined in the AC and NFPA 414.

- The nozzle shall be Hydro-Chem non-aspirating direct injection type, capable of water/foam flow discharge rates of either 625 or 1250 GPM with a dry chemical discharge rate of 16 pounds per second.
- An electronic joystick control shall be provided with integrated controls for discharge activation, selection of agent type, and discharge rates and patterns from straight stream to fully dispersed (fog pattern).
- When initially actuated, the nozzle shall deploy to a position aligned horizontally and vertically with the vehicle.
- The turret shall be an Elkhart Brass Scorpion. The turret shall be high-flow, electric motor driven and shall be adequately reinforced to sustain all anticipated loads and reaction forces when the nozzle is discharging. Each axis of travel shall feature double race bearings. The waterway shall be Teflon impregnated and be a hard-anodized aluminum alloy. The electric motors for horizonal and vertical travel shall be sealed, high-torque type and shall utilize sealed planetary gearboxes. There shall be fully proportional speed control. There shall be absolute position sensors. All electronics shall be fully potted. There shall be provisions for manual override in the event of an electrical failure, for both vertical and horizontal axis.

Under truck Nozzles:
Per the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C plus the following

A minimum of (4) four under truck nozzles shall be provided, capable of providing a sufficient foam/water combined spray pattern to cover the total under truck area as well as the inner sides of the wheels and tires.

AUXILIARY EQUIPMENT

- The following shall be supplied loose, not installed.
  - One (1) Ansul 30 LB Class D Fire Extinguisher
  - One (1) Ansul 30 LB Heavy Duty Bracket
  - One (1) Buckeye 15.5 LB Halotron W/2A:10BC Rating
  - One (1) Heavy Duty Bracket Model 810
  - One (1) Akron 1088 Piercing Applicator -6ft 1 1/2 " NPSH
  - One (1) Akron 2129 SHUT OFF 1 1/2" NPSH
  - One (1) Red Head Brass 1-inch Spanner Wrench Set
  - One (1) Red Head Brass 1-inch Spanner Holder
  - One (1) Flat head Axe 36" length, Fiberglass Handle (8 LB axe)
  - Two (2) Triple Wrench Holder with Spanner and Hydrant Wrench (Adjustable Hydrant Wrench with Bracket and Spanners)
  - One (1) Akron 448 Holder with Two (2) Style 10 Universal Spanner Wrenches
  - Two (2) Storz spanner wrenches with mounting bracket
  - Dry chemical fill funnel
  - One external pump used for transferring foam. Dixon pumps M-1500 cart.

Quality Assurance
The contractor is required to fully comply with all items regarding quality assurance, test and technical service and training as defined in the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C.

The following test and inspection procedures shall be completed;

- The manufacturer shall put 200 miles on the unit prior to shipment.
- The manufacturer shall put 20 hours of vehicle run time on the unit prior to shipment.
- The manufacturer shall run the deluge system for 30 minutes prior to shipment.
- The manufacturer shall run the water pump for 1.5 hours prior to shipment.
- The manufacturer shall conduct 5 input-based foam testing system tests for all discharges and save results in system prior to shipment.
- The manufacturer shall run all systems for the entirety of 1 tank of water using undertruck discharges (mirrors, windows, turrets, HVAC, lights, etc.)
- The manufacturer shall perform a secondary hardware check in compartments and on top of the truck prior to shipment.
- The manufacturer shall have factory Field Service Representative operate and function truck prior to shipment including review of the out of process work list, if any, to verify acceptable assembly.

Quality Assurance
The contractor is required to fully comply with all items regarding quality assurance, test and technical service and training as defined in the NFPA Standard 414 (2020 edition or current editions) as amended by -10E A/C.

The following test and inspection procedures shall be completed and documented prior to the final inspection.

- The manufacture shall put a minimal of 200 miles on the unit.
    - The 200 miles shall be a combination of the following:
        - Ten (10) tests where the vehicle is driven a minimum of 10 miles. Discharge one tank of water using a minimum of the bumper turret, roof turret and under trucks. Five (5) of these discharges shall be a complete Eco EFP test of all discharges. While driving the apparatus operator will conduct several tight turns, and at least two serpentine courses where the apparatus turning has to be tested to the limits.
        - Two (2) tests where the vehicle is driven to off-road using the course in Oshkosh. The apparatus will be tested per NFPA 414 2020 addition. Tests include:
            - Testing the axels locked up
            - Testing all 8 wheels locked up.
    - The manufacture shall test the apparatus according to NFPA 414 section 6.4 and Table 4.1.1.2 (b). The Manufacture will provide documentation at or before final inspection showing the apparatus past all operational tests.

        - 6.4.1.1; Side Slope
        - 6.4.2; Weight/Weight Distribution
        - 6.4.3: Acceleration
        - 6.4.4; Top Speed
        - 6.4.5; Breaking
        - 6.4.6; Air System/Sir Compressor Test
        - 6.4.7; Agent Discharge Pumping Test
        - 6.4.8; Dual Pumping System Test
        - 6.4.9: Pump and Maneuver Test
        - 6.4.10 Hydrostatic Pressure Test
        - 6.4.11; Foam Concentration Test
        - 6.4.12; Primary Turret Flow Rate Test
    - The manufacturer shall have factory Field Service Representative operate and function truck prior to shipment including review of the out of process work list, if any, to verify acceptable assembly.

On-site Training
At time of delivery the successful bidder shall provide a factory-trained technician, from the manufacturers' headquarters, to perform the following:

- Post-delivery inspection of the finished vehicle
- Prepare vehicle for service
- Complete final adjustments to all operating systems
- Conduct operator familiarization training for all three (3) shifts of operators
- Conduct basic maintenance familiarization training for the maintenance staff
- The goal is to have the vehicle able to go into service at the end of the on-site training. A field service trainer shall be available for DENs use only for a minimum of 5 days in order to meet the goal of putting the rig in service by the end of the field training.
    - If this goal is unattainable the manufacture agrees to communicate with DEN and to do everything possible to meet this goal.

Chassis Manufacturer Certification
Chassis manufacturer shall be ISO 9001 certified for the production of heavy trucks. Claims of self-certification programs are self-serving and are not acceptable for this procurement activity. Third party verification is required given the import and scope of the equipment and the purchaser's equipment procurement program. Certification documentation of chassis manufacturer compliance with 9001 FROM AN ACCREDITED THIRD PARTY is required in the bid package. Bids not including this documentation will be deemed not acceptable.

General:
Technical Resources: Two copies of the following technical resources shall be provided upon delivery of the vehicle, printed and on USB flash drive:

- Operator's Manual
- Service Manual

- Parts Manual

Additionally, this information shall be available on a website with information for specific vehicles “as built”.

Warranty: The contractor shall provide a One-year warranty as a minimum.

- Base vehicle – One year
- Engine – Five years
- Transmission – Five years
- Water Pump – Five years
- Oshkosh driveline system including Power Uniter, Transfer Case, TAK4 axles and all drive shafts – 5 years
- Water/Foam Tank - Lifetime

The warranty statement shall include the following:

- Manufacturer's obligations
- Duration of warranty period
- Warranty procedure
- Disclaimers

Factory Inspection Trips

TBD by DEN – There shall be provisions for four (4) people to visit the factory two (2) times. The first is a mid-build inspection, the second is a final vehicle inspection. Denver needs a minimum of 4 weeks notification so the travel can be approved per Denver’s rules.

CITY PO EXHIBIT
City and County of Denver
Fleet Management
Vendor Supplied Information Data

City Unit(s) # (City Use Only)

ENTER CITY PURCHASE ORDER NUMBER: PO- _ _ _ _ _ _ _ _ _ _
Example:PO-00003584

The following <u>underlined forms</u> and information are <u>REQUIRED</u> for new vehicle deliveries:

☐ <u>Copy of entire Purchase Order (all pages)</u>

☐ <u>Original MSO (Manufacturers Statement of Origin)</u> – is required for all vehicles except off-road and construction equipment. May receive one for some off road equipment if manufacturer issues one.

Name of purchaser: **City and County of Denver**
Address: **201 W. Colfax Ave. Dept. 304**
Denver, CO 80202

☐ <u>Secured Dealer Bill of Sale (DR2407)</u> – IN STATE ONLY – Required for on the road vehicles Such as cars, pickup[s, vans and any vehicle under 16,000 GVWR. Not needed if odometer Section is filled out and signed on MSO. Not required on vehicles over 16,000GVWR LBS.

☐ <u>Application for Title and Registration (DR2395)</u> – Required for all on-road vehicles and trailers.

☐ <u>Verification of Vehicle Identification Number (DR2698)</u> – Required for all Vehicles coming from an out of state dealer, incomplete vehicle. I.E. Cab and Chassis.

☐ <u>Statement of Fact (DR2444)</u> - Required on all vehicles with modifications to the cab and chassis. Such as a body crane, auxiliary engine, etc. The statement of fact must include the modifications made and include VIN numbers of chassis and equipment.

☐ <u>Special Mobile Machinery Form (DR2689)</u> - Required on all off road and Construction equipment. I.E. Front end loaders, tractors, skid steer loaders, Mowers, air compressors, motor graders, etc.

☐ <u>Weight slip required</u> - (on all incomplete vehicles that are made into a complete vehicle) – and all off-road equipment and construction type equipment. (Front end loaders, sweepers, graders, air compressors, rollers, etc.).

☐ <u>Temporary License Plate</u> – Required for all on-road vehicles. Not required for off road Equipment.

☐ <u>**Original** Dealer Invoice</u> – Required for all vehicles on and off the Road.

☐ <u>Receipt or Contract for Optional Warranty</u> – Only if spec or called out on P.O.

☐ <u>Shop and Parts manuals (as required) (CD or electronic form preferred)</u> – Only if spec or show as a line item of P.O.

☐ Standard Sales Tax Receipt for Vehicle Sales (DR0024)-IN STATE ONLY- Required for purchases to disclose the purchase amount to the state.

Dealer Signature:_____Date:_____