Burton's Fire Inc.
1301 Doker Drive
Modesto, CA. 95351
Tel: (209) 544-3161
Fax: (209) 544-1109
E-Mail: mike@burtonsfire.com

Dear Chief Logan Conley:

We at Rosenbauer would like to thank the Colusa City Fire Department for the invitation to, and consideration of the following bid proposal.

Enclosed you will find our proposal and detailed set of specifications for a complete Rosenbauer One (1) RSD Stock 78' Viper Aerial Quote #7731 based on the specifications provided our company by the Department.

Our proposal page for each type of apparatus with the cost of the vehicle is located in the corresponding Proposal section. We have also included additional information regarding our company and some recent references following this letter. Our proposal page with the cost of the vehicle is located in the Proposal section. Clarifications to the Specifications and Option pricing are also located in the Proposal sections of this binder.

Rosenbauer manufacturers a complete line of quality fire apparatus including small rescue vehicles and mini-pumpers, heavy duty rescue vehicles, commercial and custom type 1, 2, 3 pumpers, water-tenders, AARF vehicles, and aerials. As the world's largest manufacturer of fire apparatus and second largest in the United States, we have many satisfied fire departments in California and all over the world that are using equipment built by us.

During your review of our proposal, if you have any questions or require additional information, please do not hesitate contacting myself with any questions you may have. I can be most easily reached at (530)632-5008. I would also be happy to meet you and representatives from the department to go over our proposal in person. Please just let us know what day and time works out best for you and the department. Thank you for your consideration.

Burton's Fire Inc. was established by brothers Ken and John Burton in January 1991. Burton's Fire has a full line service and repair facility in Modesto and employees 25 people to support the fire service. Burton's Fire Inc. also provides mobile service, pickup and delivery of your engines along with a full line parts department.

Sincerely,

Mike Rubach
Burton's Fire, Inc.

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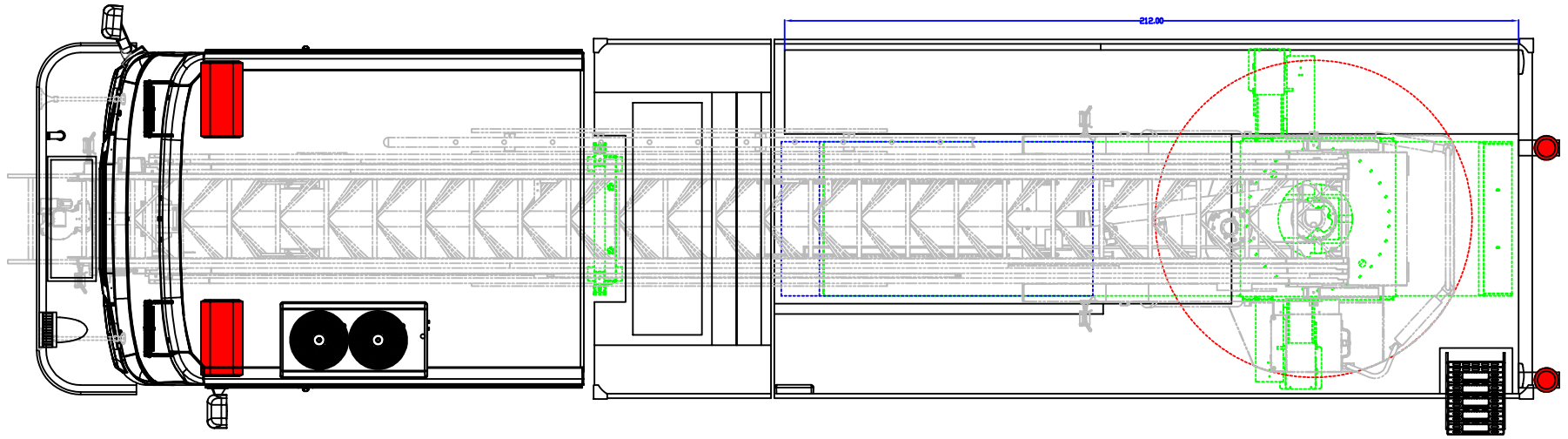
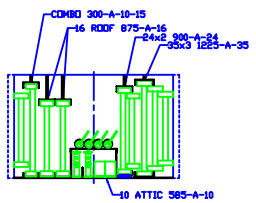
INTIALS: –
JOB NUMBER: 7728
DATE: –

MAIN FILE: –
DEPT: –
DEALER: –

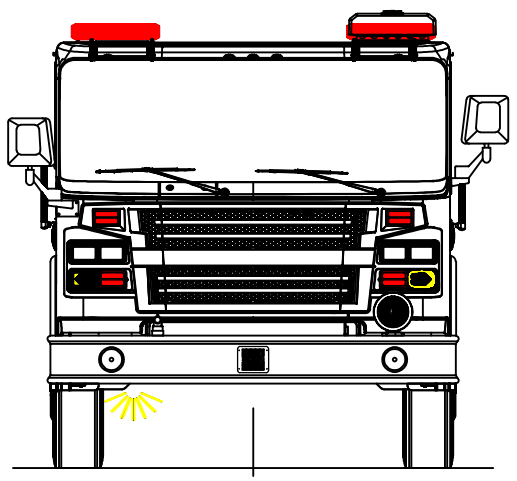
~~PRODUCTION APPROVED~~

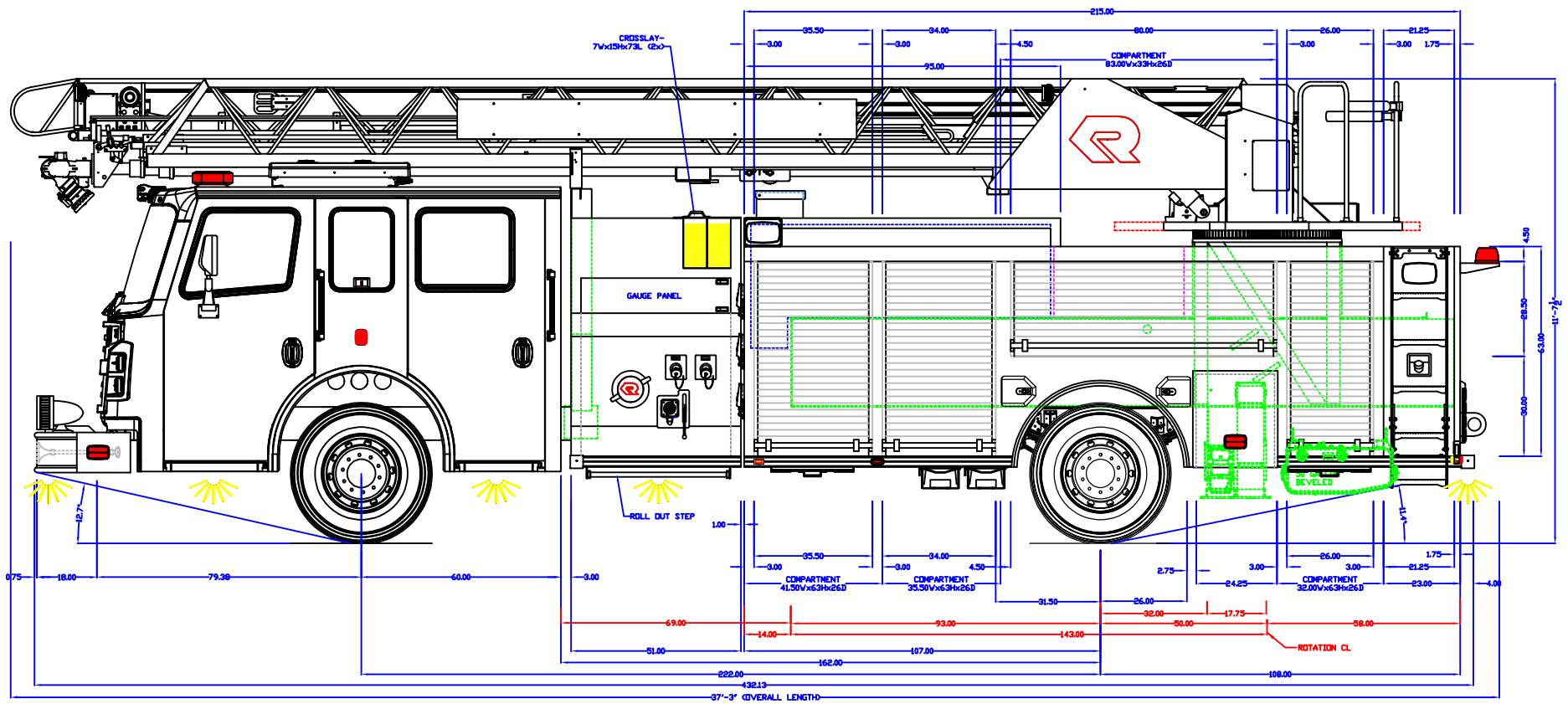


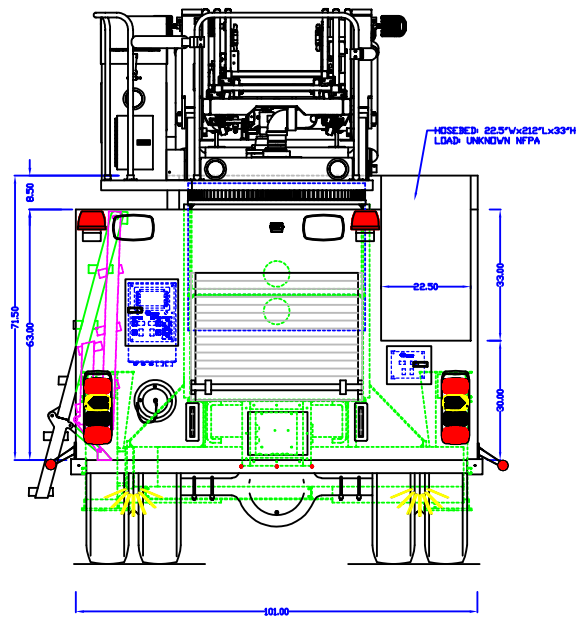


NOTES:
1. OVERALL HEIGHT IS IN LOADED CONDITION. UNLOADED HEIGHTS MAY BE 4" ABOVE HEIGHTS SHOWN.
2. DO NOT SCALE DRAWING.
3. ALL DIMENSIONS ARE APPROXIMATE AND SUBJECT TO ENGINEERING CHANGES.
4. DRAWING MAY OR MAY NOT SHOW ALL ITEMS AS DESCRIBED IN THE WRITTEN DETAIL SPECIFICATIONS.
5. INCLUSION OF AN ITEM ON THE DRAWING DOES NOT CONSTITUTE INCLUSION OF THAT ITEM WITH THE FINAL DELIVERED UNIT.
6. THE EFFECTIVE DOOR OPENINGS WILL BE APPROX. 2" LESS THAN THE NOTED COMPARTMENT OPENING FOR ROLL UP DOORS AND UP TO APPROX. 4" LESS FOR HINGED DOORS

page3







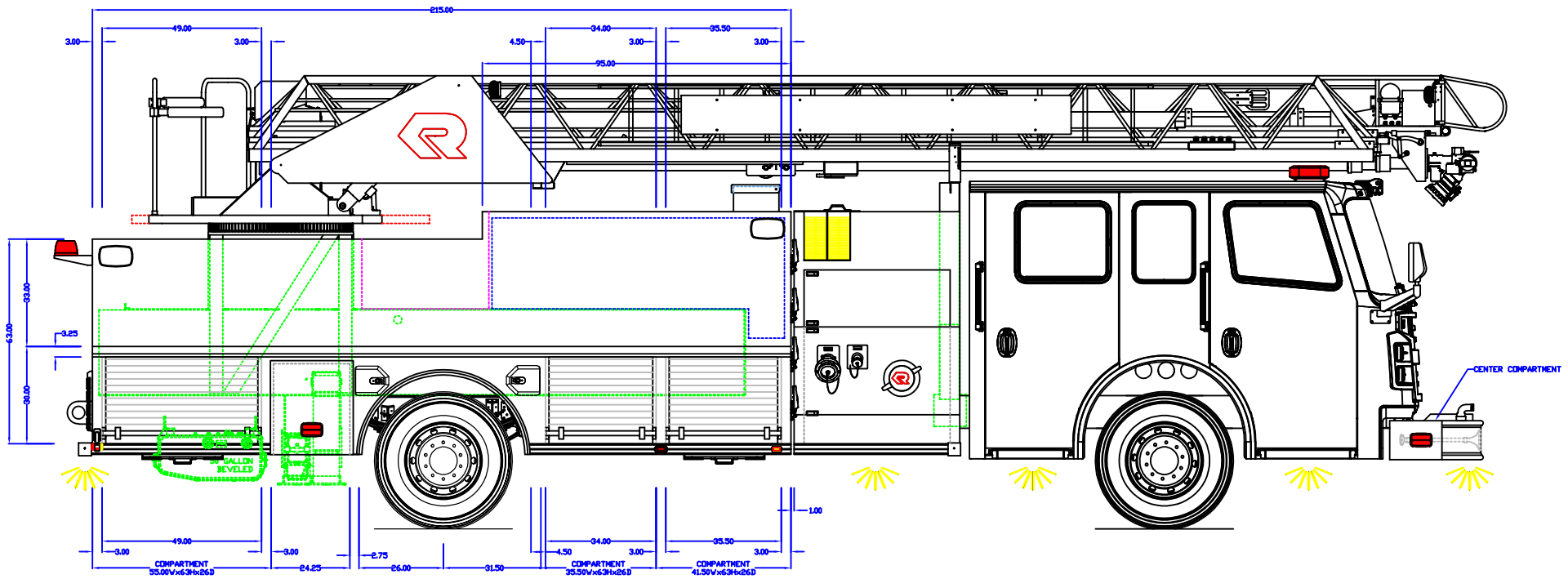


Exhibit C

REV 2:	KA	DATE: 8/6/24	END SCRUB
REV:	1	DATE: 02-23-24	DEL. FDAM, W&B CHG
DRAWN:	BPC	DATE: 12-18-23	620-D

APPROVED BY:

CHASSIS:	COMMANDER 6000
PUMP:	WATEROUS 1500 GPM
TANK:	POLY/400
PANEL MATL:	LINE-X
COMP INTERIOR:	SPATTER COAT
MAXIMUM HEIGHT	NONE
MAXIMUM LENGTH	NONE
BODY WIDTH	101"

RSD STOCK
78' VIPER

rosenbauer

ROSENBAUER FX 1/8"

DRAWING NUMBER: 620-D-1 REV: 2

January 7, 2026

Colusa City Fire Departrment
750 Market St
Colusa, Ca 95932

Sourcewell Formerly NJPA
Awarded Contract
204565

Chief Logan Conley:

Thank you for the opportunity to propose the following Rosenbauer fire apparatus:

One (1) RSD Stock 78' Viper Quote #7731

	Base Price
Chassis. Body, & Aerial Price	$1,369,314.00
Delivery	$6,500.00
Ca State Sales Tax	$119,814.98
8.750%	$1,495,628.98

Please note: Pre-Con for (2) from Dept. at Factory
No Mid-Point Inspection Required
Final Inspection for (2) from Dept. at Factory
Final Delivery will be made by Burton's Fire to the Dept.
Performance Bond Not Required
Quoted Delivery is 600 days after receipt of order
(1) Day of Familiarization training by Burton's

Terms:

Final payment due upon delivery.
Price good until March 31, 2026.
Please review specifications to see terms and conditions relating to your specified penalty clause.

Thank you again for this opportunity to work with your department, if you have any questions regarding the above proposal, please contact me at (530)632-5008 or at mike@burtonsfire.com

Sincerely,

Mike Rubach
Burton's Fire Inc.

Burton's Fire Inc.
1301 Doker Drive
Modesto, CA 95351
209-544-3161
209-544-1109 Fax
www.burtonsfire.com

South Dakota Division
100 Third Street
Lyons, SD 57041
605-543-5591
605-543-9701 Fax
E-mail: sales@
rosenbaueramerica.com

Minnesota Division
5181 260th Street
P.O. Box 549
Wyoming, MN 55092
651-462-1000
651-462-1700 Fax
E-mail: sales@
rosenbaueramerica.com

Aerial Division
870 South Broad Street
Fremont, NE 68025
402-721-7622
402-721-7622 Fax
E-mail: sales@
rosenbaueramerica.com

LEASE FINANCING PROPOSAL

Requested by

Burton's Fire, Inc.

Representing

rosenbauer

Presented To (As Lessee)

City of Colusa, CA

Proposal Date:	January 8, 2026					
Equipment Description:	(1) Rosenbauer RSD Stock 78' Viper (Quote #7731)					
Commencement Date:	February 15, 2026					
	Option 1	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Option 6**
Equipment Cost:	$1,495,628.98	$1,495,628.98	$1,495,628.98	$1,495,628.98	$1,495,628.98	$1,495,628.98
Lessee Down Payment:	$100,000.00	$500,000.00	$100,000.00	$500,000.00	$100,000.00	$500,000.00
Amount Financed:	$1,395,628.98	$995,628.98	$1,395,628.98	$995,628.98	$1,395,628.98	$995,628.98
Lease Term:	5 Years	5 Years	7 Years	7 Years	9 Years	9 Years
First Payment Date:	2/15/28	2/15/28	2/15/28	2/15/28	2/15/28	2/15/28
Payment Frequency:	Annual	Annual	Annual	Annual	Annual	Annual
Interest Rate:	4.68%	4.68%	4.79%	4.79%	4.82%	4.82%
Payment Amount:	$334,421.26	$238,627.47	$250,784.99	$178,973.96	$204,117.29	$145,628.86

Qualifications:

1. **Pricing:** This is a lease proposal for the payment stream(s) indicated above. If any of the information identified above are not correct, please advise us so that we can determine if a new proposal is required. Other important elements of this proposal are:

a) **Rate Expiration**: Signing this proposal does not in itself lock in your rate. This lease must be credit approved, contracts properly signed, and the lease funded by Leasing 2 within thirty days from the date of this proposal to protect the rates quoted.

b) **Closing Costs:** There will be no up-front costs of any kind charged by Lessor including closing costs, points, administrative costs, etc. Your attorney may charge you to review the lease documents and complete the opinion letter required with our lease documentation.

c) **Fixed Rates**: Rates for ten (10) years and under are fixed for the entire term. Terms over ten years have a one time rate adjustment after ten (10) years to the then current interest rates for the remaining term.

2. **Type of Lease:** This is a lease-purchase type of financing. After all the lease payments are made, Lessee will own the equipment without further cost.

3. **Financial Reporting**: All city, county and tax districts (including fire districts) will be expected to provide GAAP audited financial reports. All non-for profit corporations (vfd's) will be expected to provide IRS 990 federal tax returns. If you do not maintain these types of financial reports, please contact us to discuss.

4. **Vendor Payable / Escrow Account (where applicable):** In the event that the truck(s) and/or equipment are not ready to be delivered, proceeds of this lease will be held in a vendor payable account until delivery/acceptance. This is a non-interest bearing account to Lessee.

5. **Credit Approval and Documentation:** This is a proposal only, and does not represent a commitment to lease. This financing is subject to credit review and approval and execution of mutually acceptable documentation, including the opinion of lessee's counsel opining that the agreement is legal, valid and binding, obligation of Lessee.

Financing by: Leasing 2, Inc.
Contact: Carter Meyers
Phone: 813-258-9888 x15
Email: cmeyers@leasing2.com
Web: www.leasing2.com

LEASING 2

REQUEST TO PROCEED:

When you are ready to proceed with Leasing 2 towards finalizing this lease financing arrangement, please indicate so by signing below and completing the requested information. We will immediately email you our application. Thank you for your confidence and consideration.

Proposal date: January 8, 2026 **Option Chosen:** _____ (where applicable)

Upcoming Governing Body meeting date for lease approval: _____

City of Colusa, CA
Name of Lessee

Authorized Signature	**Date**	**Title**
Printed Name Of Authorized Signature	**Last month of your budget year?**	
Contact Name *(If Different ThanAuthorized Signature)*	**Contact Phone**	**Contact Email**
Financial Contact Name *(Can be Treasurer or Clerk)*	**Contact Phone**	**Contact Email**

Please complete the above information and ***fax or email*** *all pages of the proposal to*
813-258-9333 / info@leasing2.com

25 IN BUSINESS OVER 25 YEARS LEASING 2

ASSOCIATION FOR GOVERNMENTAL LEASING & FINANCE

**** Important: A Resolution will be required with the lease contract ****
In the event that you require board action to sign this proposal, please call us so that we may forward the preferred form for the meeting.

Are you ready to move forward with Leasing 2?

Here is a quick overview of our process

1. Signed Proposal - *When you are ready to move forward with Leasing 2, email a scan of the completed and signed proposal back to Leasing 2.*

2. Credit Application - *A credit application and request for current financial reports will be emailed to the designated contacts upon receipt of the signed proposal. The credit application should be completed and returned promptly to protect your quoted interest rates. Credit approval usually comes within a few days receipt of the completed credit application.*

3. Financing Agreement - *Once credit approval is accomplished, the financing agreement will be emailed for review and signature. Once the contracts are signed and returned, we are ready for closing.*

REPUBLIC FIRST NATIONAL

2525 West State Road 114
Rochester, IN 46975
(800) 700-7878
Fax: (800) 865-8517

www.republicfirstnational.com

January 8, 2026

To: Chief Logan Conley
Vendor: Burton's Fire, Inc.
From: Angie Deming

Customer: City of Colusa (Fire Department)

Thanks for the opportunity to give you a quote on your latest project!

Equipment: One (1) RSD Stock 78' Viper (Quote #7731)

OPTION 1 2 Year First Payment Delay / 5, 7 & 10 Payments over a 6, 8 & 11 Year Term

Unit Cost:	$ 1,495,628.98	Term (Years):	5	7	10
Down Payment:	$ 100,000.00	Payments:	$ 330,844.59	$ 247,386.42	$ 185,966.81
Net Financed:	**$ 1,395,628.98**	Factor:	0.23706	0.17726	0.13325
Payment Frequency:	Annual	APR:	4.39%	4.49%	4.65%
First Payment Date:	January, 2028				

OPTION 2 2 Year First Payment Delay / 5, 7 & 10 Payments over a 6, 8 & 11 Year Term

Unit Cost:	$ 1,495,628.98	Term (Years):	5	7	10
Down Payment:	$ 500,000.00	Payments:	$ 236,021.51	$ 176,483.22	$ 132,667.03
Net Financed:	**$ 995,628.98**	Factor:	0.23706	0.17726	0.13325
Payment Frequency:	Annual	APR:	4.39%	4.49%	4.65%
First Payment Date:	January, 2028				

Delivery Date: To be determined

* To qualify for the quoted rates, audited financial statements required.
* This is a proposal only and not a commitment to finance. This proposal is subject to credit review and approval and proper execution of mutually acceptable documentation.
* This transaction must be designated as tax-exempt under Section 103 of the Internal Revenue Code of 1986 as amended.
* Lessee's total amount of tax exempt debt to be issued in this calendar year will not exceed the $10,000,000 limit.
* Payments and rates reflect pre-application of escrow earnings and manufacturer discounts, if any.

Sincerely,
Republic First National Corporation

Angie Deming
angie@rfnonline.com

COMMUNITY LEASING PARTNERS

Phone: 888.777.7850
Fax: 888.777.7875
Cell: 785.313.3154
215 S. Seth Child Road
Manhattan, KS 66502
www.clpusa.net

January 8, 2026

Customer Name: **Colusa, CA**

Equipment: One RSD Stock 78' Viper
Sales Representative: Mike Rubach @ Burton's Fire

Community Leasing Partners, a Division of *Community First National Bank*, is pleased to present the following financing options for your review and consideration.

Option 1

Total Cost:	$ 1,495,628.98	Payment Frequency:	Annual
Down Payment:	$ 100,000.00	First Payment:	Two years from closing
Escrow Discount:	$ 55,973.00		
Amount Financed:	**$ 1,339,655.98**		

Term in Years:	5	7	10
Payment:	$321,095.99	$240,810.00	$179,994.43
Factor:	0.239685	0.179755	0.134359
Interest Rate:	4.68%	4.79%	4.82%

ESCROW STRUCTURE Escrow Funding Date February 7, 2026

Date Available	Total Available	Disbursement
July 2, 2027	$1,395,628.98	Final
Total:	$1,395,628.98	

- Interest Earnings in the escrow account have been estimated and used to reduce borrowing cost incurred by the Lessee.
- Premature disbursements or delay in funding to the escrow may result in shortage of funds needed to fulfill vendor
- **THERE ARE NO DOCUMENTATION OR CLOSING FEES ASSOCIATED WITH THIS PROPOSAL.**
- The quoted interest rate is valid for 10-days from the date of the proposal. To lock in the interest rate, a credit submission would be required, and a credit approval attained within the same 10-day period. This financing is to be executed & funded within 30 days of the date of the proposal or Lessor reserves the right to adjust the interest rate. The proposal is subject to credit review and approval and mutually acceptable documentation.
- This proposal has been prepared assuming the lessee is bank qualified and that the proposed lease qualifies for Federal Income Tax Exempt Status for the Lessor under Section 103 of the IRS Code.

Thank you for allowing Community Leasing Partners the opportunity to provide this proposal. If you have any questions regarding the options presented, need additional options, or would like to proceed with a financing, please contact me at 888.777.7850.

Respectively,
Blake J. Kaus
Vice President & Director of Leasing
blakekaus@clpusa.net

COMMUNITY LEASING PARTNERS

Phone: 888.777.7850
Fax: 888.777.7875
Cell: 785.313.3154
215 S. Seth Child Road
Manhattan, KS 66502
www.clpusa.net

January 8, 2026

Customer Name: **Colusa, CA**

Equipment: One RSD Stock 78' Viper
Sales Representative: Mike Rubach @ Burton's Fire

Community Leasing Partners, a Division of *Community First National Bank*, is pleased to present the following financing options for your review and consideration.

Option 1

Total Cost:	$	1,495,628.98	Payment Frequency:	Annual
Down Payment:	$	500,000.00	First Payment:	Two years from closing
Escrow Discount:	$	39,880.00		
Amount Financed:	**$**	**955,748.98**		

Term in Years:	5	7	10
Payment:	$229,079.09	$171,800.76	$128,638.11
Factor:	0.239685	0.179755	0.134594
Interest Rate:	4.68%	4.79%	4.82%

ESCROW STRUCTURE Escrow Funding Date February 7, 2026

Date Available	Total Available	Disbursement
July 2, 2027	$995,628.98	Final
Total:	$995,628.98	

- Interest Earnings in the escrow account have been estimated and used to reduce borrowing cost incurred by the Lessee.
- Premature disbursements or delay in funding to the escrow may result in shortage of funds needed to fulfill vendor
- **THERE ARE NO DOCUMENTATION OR CLOSING FEES ASSOCIATED WITH THIS PROPOSAL.**
- The quoted interest rate is valid for 10-days from the date of the proposal. To lock in the interest rate, a credit submission would be required, and a credit approval attained within the same 10-day period. This financing is to be executed & funded within 30 days of the date of the proposal or Lessor reserves the right to adjust the interest rate. The proposal is subject to credit review and approval and mutually acceptable documentation.
- This proposal has been prepared assuming the lessee is bank qualified and that the proposed lease qualifies for Federal Income Tax Exempt Status for the Lessor under Section 103 of the IRS Code.

Thank you for allowing Community Leasing Partners the opportunity to provide this proposal. If you have any questions regarding the options presented, need additional options, or would like to proceed with a financing, please contact me at 888.777.7850.

Respectively,
Blake J. Kaus
Vice President & Director of Leasing
blakekaus@clpusa.net

rosenbauer
Firefighting Technology

Colusa City Fire Department

RSD Stock 78’ Viper

Quote #7731

Table of Contents

MEASUREMENTS

OVERALL HEIGHT

An overall height restriction has not been specified for this apparatus.

OVERALL LENGTH

An overall length restriction has not been specified for this apparatus.

OVERALL WIDTH

An overall width restriction has not been specified for this apparatus.

WHEELBASE

A wheelbase restriction has not been specified for this apparatus.

ANGLE OF APPROACH

The angle of approach for the apparatus shall not be less than eight (8) degrees as specified by the current edition of the NFPA 1901 Guideline.

ANGLE OF DEPARTURE

The angle of departure for the apparatus shall not be less than eight (8) degrees as specified by the current edition of the NFPA 1901 Guideline.

CHASSIS SPECIFICATION

CAB CUSTOM STYLE

The cab shall be a custom, cab over engine style, with the driver and officer positions ahead of the engine and front axle. The cab shall be specifically designed and manufactured for the fire service industry.

The cab shall be designed by manufacturer's engineering to meet the unique, heavy-duty construction specifications. The raw cab will be fabricated to meet the exact demand of the fire industry and shall be manufactured by a company with no less than 50 years of experience in building custom cabs. All aspects of the cab will be quality checked by manufacturers personnel. All cab and chassis customization and assembly will take place on the manufacturer's premises.

The cab shall be of a totally enclosed full tilt design, with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be capable of tilting 45-degrees, allowing the chassis engine to be removed, if required, without tilting the cab beyond 45-degrees. No Exceptions.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No solid mounted rear lock downs will be acceptable. No Exceptions.

The front cab pivot assemblies shall be 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cab super-structure shall be designed with high strength 6061-T6 aluminum extrusions and 3/16" 5052-H32 aluminum plate. This shall include the “A,” “B,” “C” and “D” extruded pillars, triple wall front end reinforced by 3/16" thick x 2"x3" extrusion tubes, 3/16" side walls and rear wall. This shall offer superior occupant protection in the event of vehicle impact.

The extrusions shall provide adequate space for routing of wiring and hoses which will provide service accessibility. Routing of harnessing which requires pulling of wires through tubes will not be allowed. No Exceptions.

The "A" pillar shall be of a closed section, one-piece extrusion extending from the cab header to the bottom of the cab. This design shall ensure strength and superior resistance to buckling in the event of a frontal impact.

The cabs front corners shall be constructed of 5052-H32 stamped aluminum to provide a consistent material composition. The stamping process alleviates the high tendency of fractures through the fusing of dissimilar metal composition as appears with a casting process.

Cast cab components, including cab corners, "A" pillars and front fascia components shall not be acceptable due to the high tendency of fractures. No Exceptions.

Additional cab strength shall be obtained through closed section, dual extrusions in the construction of the "D" pillars.

The front facade shall be constructed with dual wall .19” thick 5052-H32 aluminum plates which make up the front bulkhead, reinforced by .19” thick 6061-T6 aluminum extrusion (box-

sections), though-out the inner and outer perimeter of the front end / facade. The reinforcing third wall / barrier is .13" thick 5052-H32 work hardened aluminum facade panels. All panels shall be welded, no adhesive.

The cab side wall of the cab shall be 3/16" thick 5052-H32 aluminum plate. The cab side plate shall wrap the corner of the cab b pillar and slam post. The cab rear wall plates shall be reinforced with a minimum of two (2) 3/16 x 3" aluminum sections; the cab side reinforcements shall be a minimum of 28" apart and span from the cab B pillar and cab C pillar.

The rear wall of the cab shall be 3/16" thick 5052-H32 aluminum plate. The rear cab plate shall wrap the corner of the cab and attach to the cab D pillar and slam post. The cab rear wall plates shall be reinforced with four horizontal and dual vertical support sections; the dual vertical support structure shall consist of 1/8" thick x 2" 6061-T6 aluminum tubes and the horizontal hat sections shall consist of 1/8" thick x 4" 5052-H32 aluminum. The dual vertical support sections shall be 40" a-part, and the cab shall contain a minimum of four (4) 4" hat section horizontal supports.

Additionally, the rear edge of the floor shall include a 3/16" 6061-T6 aluminum tube extrusion (under the floor) and a 7" 5052-H32 aluminum cab floor support section (above the floor).

The outside cab width shall measure 99" across. The interior cab shall have a width of 93".

The cab length shall measure 77-1/3" from the center of the front axle to the front cab skin and 60" from center of the front axle to the back of the cab, for a total cab length of 137.3".

The cab shall also feature ample driver and officer foot room, a total of 3.7 square feet for the driver and 4.45 square feet of floor space at the officer's feet. (No exceptions)

The crew floor shall feature a complete flat floor design, including provisions for a one o'clock PTO inclusion, while still offering an uninterrupted 25 total square feet of space.

The leading edge of the cab floor from the steps shall meet NFPA 15.7.4 slip resistance requirements on both the front and rear cab doors. No Exceptions.

The cab shall meet or exceed cab impact test (SAE J-2420, cab rollover test (SAE J2422), and cab seating requirements (FMVSS 210, and FMVSS 208).

The cab shall include 4 doors. They shall have a front two (2) cab doors shall have a minimum clear opening of 42.5" wide by 81" high measured from the top of the lower cab step to the top of the door opening and the rear two (2) crew doors shall be a minimum clear door opening of 38-1/2" wide by 81" high measured from the top of the lower cab step to the top of the door opening. The length of the door will vary depending on the door type.

ROOF STYLE - FLAT

The roof of the cab shall incorporate a flat roof style. The cab roof design shall incorporate an angled front roof, transitioning into a rolled extrusion for a swept back design.

The roof of the cab shall feature dual .25" thick interlocked structural member extrusions running the entire width of the cab defending against buckling in the event of a rollover.

The interior cab height based on the flat roof style shall measure a minimum of 55-1/2".

The crew roof super structure shall include a reinforcement hat-section structure 1/8" thick 5052-H32 aluminum bracing. The for-aft support braces will be 24" on center apart, the side-to- side support braces will stretch from cab side to cab side and centered between the dual 3/16" extruded and plate reinforced roll-cage section.

The forward cab roof section shall include a combination of 1/8" 6061-T6 extruded tube reinforcements and a hat-section structure 1/8" thick 5052-H32 aluminum bracing. The bracing shall wrap the entire perimeter of the cab forward roof, and the condenser support structure.

The condenser support structure shall include 1/8" triple sections, supporting the outer perimeter and center of the condenser mounting pad.

Additionally, the entire roof super structure is reinforced by a .25" thick roof edge corner extrusion around the entire cab perimeter.

A drip rail shall be provided along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

DRIP RAIL EXTENSION

The cab shall have a drip rail extension in front of the driver and officer doors. The drip rail shall be connected to the rail along the roof and run midway down the "A" pillar to help prevent water from entering the cab when the front doors are opened. The rail shall be painted to match the cab exterior paint and paint break.

CAB STEPS

The cab steps shall meet NFPA 13-7.3 in size and slip resistance requirements.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22” from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 33" wide x 10" deep. The front cab intermediate step shall measure a minimum 31" wide x 8" deep.

The crew cab first step shall measure a minimum of 26" wide x 10" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9" deep.

The top crew step shall incorporate an angle approximately midway from the rear wall to the crew door hinge extending out the flooring under the rear facing outer seat positions, offering foot placement for safety while seated in this position.

CAB STEP TRIM

The cab steps shall include a .80-gauge stainless steel construction on the first step, the step closest to the ground. The stainless-steel finish shall be a number 7 mirror. The step shall include a frame which is integral with the construction of the cab for rigidity and strength. The round hole pattern shall allow water and other debris to flow through rather than becoming packed under the step. The middle step shall be integral with the cab in construction and shall be trimmed in 3003-H22 embossed aluminum tread plate which is 0.100" thick.

CAB DOORS

The cab shall include a total of four (4) doors, two (2) forward and two (2) rear crew doors.

The forward cab doors shall be a minimum of 45" wide and have a cab structure opening of 42.5" wide. The rear crew doors shall be a minimum of 41" wide and a cab structure opening of 38.5" wide to provide enhanced entry and egress of the cab.

Each cab door shall feature:

- Superior strength and rigidity from 3/16" closed section extruded door frames
- Damping inside each door for a solid feel and minimized reverberation when closed
- A rolled rubber bulb seal style gasket shall be utilized around the door ensuring a weather tight fit
- Integrated, mechanical door stop
- A full length, hidden piano style 10-gauge stainless steel door hinge with a 3/8" pin, which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge
- An integrated one-piece inner door assembly that includes a glass track, mounting provisions for window regulator, door handle and door panel shall be utilized. The inner

door assembly shall be easily removed with nut inserts. Self-tapping screws shall not be acceptable.

FULL LENGTH DOORS

All doors shall be full length from the roof of the cab extending down to cover and protect the entrance step areas.

CAB STEP TRIM KICKPLATE

The vertical section of all cab step risers at each door shall include an aluminum treadplate finish.

DOOR HANDLES

The exterior door handles shall be constructed of die-cast steel and chrome plated for a pleasing appearance. They shall feature a vertically oriented heavy duty pull style handles which are extended out and suitable for easy grasping with a gloved hand.

The interior door handle shall be a paddle style which shall be chrome in color. The paddle shall be hinged towards the rear of the cab.

Each door latch shall feature a military grade aligning dove tail guide striker assembly for precision door closure which prevents sagging throughout the life of the vehicle. No exceptions.

CAB DOOR LOCKS

All cab doors shall include manual door locks with keys. The door lock shall include a toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integrated with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab.

INTERIOR CAB DOORS

All cab doors shall consist of a one-piece formed and stamped aluminum interior panel. The panel shall include a formed collar around the interior door latch. The door panels shall be attached to the door with nutserts. ABS material shall not be acceptable. No exceptions.

INTERIOR CAB DOOR FINISH

All cab doors shall be finished with a polyurethane coating for durability. The finish shall be gray in color.

INTERIOR CAB DOOR CHEVRON

Reflective striping shall be installed on the interior of each chassis door. The lower portion of the doors shall have scotch lite red and yellow chevron striping applied to it. The striping shall be a minimum of 96 square inches per door. No Exception.

INTERIOR FRONT DOOR PULL

The interior driver and officer cab doors shall each include one (1) customized cast aluminum single piece door grab pull designed specifically for the fire service.

The single piece door pull shall have a curved designed in an “L” formation to provide multiple points for grasping with a gloved hand. The horizontal dimension shall be a minimum of 28" and the vertical dimension shall be a minimum of 20". The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. No Exceptions.

The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless-steel fasteners with nut inserts in each location. Self-tapping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a red powder coated finish.

INTERIOR GRAB HANDLE REAR DOOR

The interior driver and officer rear cab crew doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

A red powder coated cast aluminum grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally the width of the window just above the windowsill. The handle shall have an ergonomic curve making it easier to grasp assisting with entry and egress from the crew area of the vehicle. No Exceptions.

The door pull shall feature secure mounting with stainless-steel fasteners with nut inserts in each location. Self-tapping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a red powder coated finish.

GRAB HANDLES "A" PILLAR

Two (2) additional molded 9.00” rubberized grab handles shall be installed inside the cab adjacent to the front doors. The handles shall be located, one (1) on the driver’s side "A" Pillar and one (1) on the officer's side on the "A" Pillar.

WINDSHIELD

A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of area will be provided. No Exceptions.

The windshield shall feature:

- A completely uninterrupted view from both the driver and officer positions
- The windshield will consist of three (3) layers. The outer layer, the middle safety laminate, and the inner layer. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage.
- Economical replacement readily available from auto glass supplier
- Easily removable for replacement using standard automotive techniques
- A frit band will be provided along with an outer trim seal on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPER SYSTEM

A single windshield wiper system shall be incorporated in conformance with FMVSS and SAE requirements. Two (2) 22" windshield wiper arms shall be mounted below the windshield. Each arm shall include a 26" long wiper to provide optimum windshield clearing.

The windshield wiper fluid reservoir can be filled without raising the cab.

WINDSHIELD WIPER ACTIVATION

The windshield wipers shall be activated through a switch on the driver's panel, with intermittent control.

POWER WINDOW - DRIVER'S DOOR

The driver's door shall include a window which measures a minimum of 23.5" wide x 29" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 681 square inches. The glass shall include a standard automotive tint and through powered actuation, shall completely roll into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to prevent water from entering the cab when closed.

POWER WINDOW SWITCHES

The Driver shall have switches for each of the cab door windows. The powered windows in the officer door, and each respective crew door, shall be activated by a switch on the respective door itself.

The switches for the driver and officer door windows shall be installed within a customized door grab handle. No Exception

POWER WINDOW - OFFICER'S DOOR

The officer's door shall include a window which measures a minimum of 23.5" wide x 29" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 681 square inches. The glass shall include a standard automotive tint and through powered actuation, shall completely roll into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to prevent water from entering the cab when closed.

REAR DRIVER SIDE WINDOW

The rear driver's side crew door shall include a window measuring 22.5" wide x 27" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 607 square inches. The glass shall include a standard automotive tint and through powered actuation, shall roll completely into the door housing. The power window shall be activated through a switch located on the top of the door panel.

REAR OFFICER SIDE WINDOW

The rear officer's side crew door shall include a window measuring 22.5" wide x 27" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 607 square inches. The glass shall include a standard automotive tint and through powered actuation, shall roll completely into the door housing.

DRIVER CANOPY SIDE WINDOW

The cab shall include a fixed driver's side window glass which shall be located between the cab front and rear doors. The fritted glass shall have a clear viewing area of 15.5" wide x 21.5" high and shall include a standard automotive tint. To eliminate the possibility of corrosion, rubber gasket rings shall not be used in the installation of the window, the window shall be glued in.

OFFICER CANOPY SIDE WINDOW

The cab shall include a fixed officer's side window glass which shall be located between the cab front and rear doors. The fritted glass shall have a clear viewing area of 15.5" wide x 21.5" high and shall include a standard automotive tint. To eliminate the possibility of corrosion, rubber gasket rings shall not be used in the installation of the window, the window shall be glued in.

CAB INSULATION

The cab shall be insulated from road and vehicle resonance, exterior sound, and thermal intrusion.

The cab insulation system shall be comprised of three separate components each designed to assure optimal thermal and acoustic properties are achieved. Two layers of insulation material shall be utilized.

A minimum of .8" of SCbond Polyurethane Foam insulation shall be applied as an additional insulation between the cab skin and all interior ceiling surfaces. The insulation shall have a density of 10 lb/ft3 +/-.5 providing better thermal properties and acoustic reduction properties.

A layer of 1/8" barrier bubble film laminated between two layers of reflective metalized film shall be provided in the roof to minimize the effects of radiant heat. The barrier shall be mold and mildew resistant and have a Class A/Class 1 fire rating. The barrier shall have a minimum of a R-5.6 rating. No Exception

The interior cab insulation system shall meet NFPA 1901 14.1.6 standards and ensure that no seated position within the cab exceeds 90dB. This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off.

All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation.

The interior of the cab including the rear wall, side walls and ceiling panels shall be insulated.

Use of open cell material as the primary insulation will not be acceptable. No exceptions.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines.

The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of NFPA 1901.

The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether-based foam with a textured surface, specifically designed for acoustic absorption.

Use of aluminized faced material on the engine tunnel shall not be acceptable. No exceptions.

The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive.

The insulation shall meet or exceed FMVSS 302 flammability testing.

DAMPING INSULATION

The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact, and resonance within the cab.

INTERIOR TRIM MATERIAL

The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of ASTM D751 of excellent, tear strength meeting the Federal standard 191-5134 of excellent and shall be oil resistant passing the CID-A-A-2950A requirement for no permeation.

Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable. No Exceptions.

The soft trim vinyl shall feature mildew resistance passing ASTM G21-90 and shall be rated to -25 degrees Fahrenheit.

The vinyl shall be flame retardant meeting California Fire Code 117, UFAC Class 1, and BIFMA Class 1 and shall have a high resistance to abrasion.

The interior of the cab including the ceiling panels shall feature this soft trim and shall be black in color.

REAR WALL INTERIOR MATERIAL

The rear wall of the cab shall be covered in black 31 oz. marine grade vinyl for a more pleasing appearance.

THROTTLE AND BRAKE PEDALS

The apparatus shall have suspended throttle and brake pedals.

FLOOR MAT

The interior flooring of the cab shall be covered with an advanced black multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material.

SUN VISORS

The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be gray tinted plastic.

CAB DASH

The cab dash shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high-quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. No Exceptions.

The cab dash shall offer a finish of a polyurethane coating for a rugged design and finish. No Exceptions.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured, and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components. This design allows for the following features:

- Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of six (6) louvers; three louvers pointing at the driver and three louvers pointing at the officer.
- The cab dash instrument cluster shall be installed on a painted panel. This panel shall provide for easy removal to increase serviceability and provide ease of maintenance.
- For improved safety cab switches and controls shall be ergonomically located within easy reach of the driver when in the seated position with seatbelts fastened. This design will

reduce driver distraction and increase safety by putting frequently accessed driver controls within easy reach to allow the driver more time to focus on the road.

- The officer side cab dash shall have a painted fire service grade RTM composite fiberglass panel that shall house the three HVAC louvers on the officer side. This panel will also provide ergonomically located switches and controls for the officer. All controls shall be within easy reach while in the seated position with seatbelts fastened.
- Access panels on the top of the dash for both the driver and officer sides easing maintenance access to controls, components, and gauge assemblies
- The driver side dash shall include gauges for primary air pressure, secondary air pressure, a Pacific Insight instrumentation gauge panel and the DEF gauge as standard

- The driver side dash shall also include two (2) lower panels to the left and right of the steering column for FMVSS switches such as the Off/Ignition and start switches and the park brake assembly
- The driver dash shall include a panel for inclusion of an optional Weldon Vista screen and six (6) additional switches or the HVAC controls and additional switching to the right of the driver
- The officer dash shall include a recessed area for optional mounting cradles or brackets for a laptop computer, mobile data terminal, map compartment or clip board
- The officer dash shall include a panel for inclusion of an optional Weldon Vista screen and or provisions for switches and gauges to the left of the officer

ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance. Covering the engine tunnel shall be a layer of formed composite material for a contoured transition into the dash and offering a pleasing appearance.

The engine tunnel shall feature:

- A low-profile design measuring approximately 46.5" wide and 21.5" in height from the crew floor shall offer optimum visibility of the windshield and cab interior from any seated position. No Exception.
- The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16.5" from floor level and taper inward for a clear width of 26" and the final taper shall start at 21" from floor level and taper inward for a clear width of 33".
- The engine tunnel at the officer's position shall be a tapered design, featuring 23" clear width at floor level, first taper shall start 16.5" from floor level and taper inward for a clear width of 22.5" and the final taper shall start at 21" from floor level and taper inward for a clear width of 31.5".
- The design shall offer a minimum of 30" for the driver and 28.5" for the officer as measured from the inside door pan to the top edge of the tunnel. The dimension

measured at the "H" (hip) point, with the seat in the lowest position, shall be a minimum of 28.5" for the driver and 27" for the officer. No Exception.

- Recessed sections for ease of mounting equipment at the rear of the tunnel or for compartments and bases which can be used for installing Fire/EMS equipment and components such as hand-held radios.

CAB DASH & ENGINE TUNNEL

The cab dash and the engine tunnel of the cab shall be coated with polyurethane coating for a durable finish. The color shall be black.

MODULAR CENTER DASH CONSOLE

The dash and front portion of the tunnel shall include an angled modular console centered between the driver and officer positions.

The console shall feature:

- Heavy-duty housing constructed from 14-gauge steel which is powder coated with a durable semi-gloss textured black finish to provide glare and corrosion resistance
- The console top constructed of black anodized aluminum extruded rails which allow for mounting brackets, plates, and other console options
- Integral nut tracks which allow mounting of equipment to the sides of the console by way of sliding 1/4"-20 hex nuts
- A hinged lid constructed from 16-gauge steel also powder coated for corrosion resistance
- The availability of pre-wiring for specific components
- A modular design for ease of changes and future additions such as changing out brands of radio, types of sirens or adding accessory space
- The console shall offer 4 areas, 2 upper sections, A and B and 2 lower sections, C and D with mounting plates for optional components.

Havis Console - Pre Configured
Havis Console - Upper Portion
Havis Console - Upper Portion - Option 11

BLACK MOUNTING PLATE FOR RADIO

One (1) black mounting plate(s) containing radio mounting shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

BLACK MOUNTING PLATE FOR POWER POINTS

Two (2) black mounting plate(s) containing two (2) 12-volt DC power points and one (1) USB/USB-C power point shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED SIREN

One (1) black mounting plate(s) containing mounting for a siren shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED TRAFFIC LIGHTBAR CONTROLLER

One (1) black mounting plate(s) containing a plate to mount the traffic advisor lightbar controller shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED AM/FM RADIO

One (1) black mounting plate(s) containing a mount for an AM/FM radio shall be provided and incorporated in the modular dash console.
Havis Console - Lower Portion
Havis Console - Lower Portion - Option 3

BLACK MOUNTING PLATE

One (1) black mounting plate(s) containing blank plates shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED ACCESSORY BOX

Two (2) black mounting plate(s) containing a 6-inch open accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED CUP HOLDER

Two (2) black mounting plate(s) containing two cup holders shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

INSTRUMENTATION PANEL

The instrumentation panel inlay shall be painted the lower job color.

INTERIOR CAB FINISH

The interior cab shall be finished in a high-performance Polyurethane coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door.

This type of coating shall feature:

- Durability, scratch, chemical and abrasion resistance
- Consistent, even coverage and a uniform texture
- Resistance from fading from exposure to UV light
- Black in color

CAB HEADER

The cab header shall offer heavy-duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high-quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. No Exceptions.

The cab header shall offer a finish of a polyurethane coating for a rugged design and finish. No Exceptions.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with

consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

The cab header shall also be purpose built for integration of Fire/EMS components and ease of maintenance with panels above both the driver and officer positions measuring 8" wide x 15"long for mounting radios, aerial controls, and switches.

HVAC HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system that shall include a defroster, a cab and crew heater and air conditioner for a complete HVAC system. The air conditioning system shall be comprised of compressor, condenser, and a minimum of three (3) evaporators to provide consistent temperature control throughout the entire cab.

The system shall be rated as an Emergency Vehicle grade for use in Fire and Rescue style vehicles and shall provide environmental air treatment in accordance with published SAE standards.

The HVAC system shall be tested and certified by the component manufacturer and a third-party independent certified testing laboratory, including all three systems. Documentation of test results shall be provided with the bid. No Exceptions.

The HVAC system shall be a total and complete system, and shall provide sufficient defrosting, heating and cooling to the entire cab. The HVAC system shall meet or exceed all specified items without the use of auxiliary heating and cooling systems.

DEFROSTING SYSTEM

The defrosting system shall feature:

- To provide maximum defrost and heating performance, a 30,000 BTU heater-defroster unit will be provided inside the cab.
- The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable cover will be installed over the defroster unit.
- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.
- Defrost vents for the driver's and officer's windows.
- The system shall be capable of clearing 90 percent or more of the windshield in fifteen (15) minutes or less after a three (3) hour cold soak at 0 degrees Fahrenheit (-17.78 degrees Celsius).

- The system shall exceed flash fogging standards that are set forth in the SAE Heavy-duty cab with sleeper specifications. Documentation from a third-party testing facility shall be available upon request. No Exception.
- The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield.

HEATING SYSTEM

The heating system shall feature:

- Delivery of a minimum of 82,000 BTU/hour of heat to the entire cab.
- Heat and air circulation shall be provided to the driver's and officer's foot area of the cab as standard through ducting in the foot well area of both positions. No Exception.
- Substantial air movement and heating provided to the driver and officer's position, composite dash will have six (6) adjustable louvers, located in the dash, three (3) adjustable louvers directed at the driver and three (3) adjustable louvers directed at the officer and floor vents at the driver and officer.
- Aluminum dash will have (4) adjustable louvers, located in the dash, two (2) adjustable louvers directed at the driver and two (2) adjustable louvers directed at the officer and floor vents at the driver and officer.
- Dual overhead units, with five (5) adjustable louvers shall be mounted above the rear facing seat positions on the driver and officer side of the cab
- The heater shall be plumbed with a shut off valve at the engine, so that the coolant bypasses the heaters.

AIR CONDITIONING

The air conditioning system shall feature:

- One (1) evaporator shall be located under the center dash and two (2) crew overhead evaporators located near the B-pillar on each side of the cab allowing for greater frontal visibility for the forward-facing crew seating and allowing for more interior mounting of accessories.
- A gravity condensation drain system shall be utilized. These drains shall remove all condensation from the evaporator units and direct it to the exterior of the chassis cab for optimal performance. Systems utilizing pumps to remove condensation, or gravity systems with poles or other obstructions located within the cab to route drains through shall not be acceptable. No Exceptions.
- Substantial air movement for optimum cooling shall be provided to the driver and officer positions, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers shall be directed at the driver and three (3) adjustable louvers shall be directed at the officer and floor vents at the driver and officer.

- The air condition system shall be capable of cooling the cab from outside ambient average temp of 104 degrees Fahrenheit (40 degrees Celsius) to an average inside cab temp of 71 degrees Fahrenheit (22 degrees Celsius) at no less than 50% humidity in 30 minutes with an engine RPM of 1250, after a two (2) hour heat soak. A certification document from the testing facility shall be available upon request. No Exception.
- Proposals offering ceiling mounted evaporator units in the center of the cab above or on the engine tunnel shall not be accepted as this is a safety consideration due to the lack of visibility and communication within the cab.

CAB PAINT AIR CONDITIONING CONDENSER COVER

The air conditioning condenser cover shall be made from aluminum and shall be painted to match the roof color. Plastic condenser covers will not be acceptable. No Exception.

HEATER HOSE

The heater hose inside the cab for the HVAC system shall be a premium silicone hose.

CONDENSER

The cab air conditioning system shall include one (1) low profile HE-condenser which shall be centered on the driver's side of the cab roof.

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled through all available LCS.

REAR CREW AREA CONTROLS – EVAPORATOR MOUNTED

The controls for the crew area heat and A/C shall be located on the tunnel mounted evaporator unit.

REAR CREW AREA CONTROLS – LCS PANEL

The controls for the crew area heat and A/C shall be from manual HVAC control knobs. There will be no ability to control rear HVAC from the driver or officer positions.

REAR CREW AREA CONTROLS –CENTERED OVERHEAD

The controls for the crew area HVAC system shall be mounted overhead, centered between the rear facing seating position.
Seats Inc

SEAT MATERIAL

The seats shall include Turnout Tuff material; this urethane-coated denier nylon is water repellent to 75 PSI of water Pressure. Suitable for Heavy Duty applications, this cloth has a bursting strength of 300+ pounds per foot and surface abrasion of 1000+ cycles-Heavy Grit Wheel. Modeled after Turnout Gear, this material contains a rip-stop weave stopping unraveling if punctured standing up to hard working environments. Turnout Tuff is manufactured to meet flammability requirements including FMVSS 302, UFAC class 1, and California Fire Code Technical Bulletin No. 117 Section E.

SEAT BACK LOGO

The seat back shall include the "Rosenbauer" logo. The logo shall be centered on the standard headrest of the seat back.

SEAT AND SEAT BELT COLOR

The seats in the cab shall be gray in color with red seat belts.

DRIVER SEAT

The driver's seat shall be a 911 Seats XL, wide series seat.

Standard features of this 10way Non SCBA 3-point ABTS (all belts to seats) include 108 degree recline, wide contoured back with 2 way adjustable lumbar. Electronic adjustments include fore/aft, up/down, front/rear tilt.

The seat shall feature an XL 21-inch-wide comfort cushion including Seats Incorporated exclusive EVC (elastomeric vibration control) easing tailbone pressure, enhancing comfort, and reducing vibration by up to 50%. This system has Seats Inc's D2 (dual density) foam combining a soft topper foam pad further enhancing comfort, and a high-density bottom foam base to promote longevity.

The seat(s) shall have a 7-year manufactures warranty, no exception.

Cushion reinforced with French seaming and is NFPA compliant with an occupancy sensor.

SEAT BELT SINGLE RETRACTOR

The seat shall feature 3-point ABTS (all belts to seats). The single retractor seat belt shall feature Ready Reach to ensure that the seat belt is easy to see and grab while in full turnout gear.

SEAT BACK

The seat back shall incorporate a standard style headrest.

SEAT MOUNTING DRIVER

The driver's electric seat shall be installed in an ergonomic position in relation to the cab dash.

The power seat or seats installed in the cab shall be wired directly to battery power.

DRIVER SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the driver's seat. The compartment shall be 21.25 inches wide, 22.50-inches long, and 6.25 inches high. The access opening shall be 15.00 inches wide and 4.50 inches high.

ALUMINUM ACCESS DOORS

There shall be aluminum doors provided for covering each of the driver and officer seat compartment openings. The doors shall be coated to match the interior of the cab and shall be equipped with piano-style hinges and manual latches.

OFFICER SEAT

The officer seat shall be 911 Seats Incorporated 911 Seats XL, wide series seat.

The seat shall feature 3-point ABTS (all belts to seats).

The seat shall feature a 21-inch-wide XL comfort cushion including Seats Incorporated exclusive EVC (elastomeric vibration control), easing tailbone pressure, enhancing comfort, and reducing vibration by up to 50%. This system has Seats Inc's D2 (dual density) foam combining a soft topper foam pad further enhancing comfort, and a high-density bottom foam base to promote longevity. Seat to include a wide comfort back with contoured foam.

The seat(s) shall have a 7-year manufactures warranty, no exception.

Cushion reinforced with French seaming and is NFPA compliant with an occupancy sensor.

SEAT BELT SINGLE RETRACTOR

The seat shall feature 3-point ABTS (all belts to seats). The single retractor seat belt shall feature Ready Reach to ensure that the seat belt is easy to see and grab while in full turnout gear.

SEAT BACK

The seat back shall include a Seats Incorporated Halo mechanical self-contained breathing apparatus (SCBA) bracket. The Positive Locking Mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall be third Party tested to ten (10) times the force of gravity.

The bracket shall include –

- Plastic-dipped rings designed to fit the full range of bottle diameters
- Vertical height adjustment to accommodate different bottle heights
- An easy achieved safe lock without risking damage to equipment
- A center cushion release mechanism

OFFICER'S SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the officer's seat. The compartment shall be 19.75 inches wide, 17.50 inches long, and 6.25 inches high. The access opening shall be 9.00 inches wide and 4.50 inches high.

REAR FACING OUTER SEAT

Two (2) rear facing outer crew area seat(s) shall be 911 Seats Incorporated XL, wide series flip bottom seat(s).

The seat(s) shall also feature a 21-inch-wide XL comfort cushion including Seats Incorporated exclusive EVC (elastomeric vibration control), easing tailbone pressure, enhancing comfort, and reducing vibration by up to 50%. This system has Seats Inc's D2 (dual density) foam combining a soft topper foam pad further enhancing comfort, and a high-density bottom foam base to promote longevity. Seat to include a wide comfort back with contoured foam.

The seat(s) shall have a 7-year manufactures warranty, no exception.

Cushion reinforced with French seaming and is NFPA compliant with an occupancy sensor.

Belt Orientation shall pull from outboard shoulder to inboard hip

SEAT BELT SINGLE RETRACTOR

The seat shall feature 3-point ABTS (all belts to seats). The single retractor seat belt shall feature Ready Reach to ensure that the seat belt is easy to see and grab while in full turnout gear.

SEAT BACK

The seat back shall include a Seats Incorporated Halo mechanical self-contained breathing apparatus (SCBA) bracket. The Positive Locking Mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall be third Party tested to ten (10) times the force of gravity.

The bracket shall include –

- Plastic-dipped rings designed to fit the full range of bottle diameters
- Vertical height adjustment to accommodate different bottle heights
- An easy achieved safe lock without risking damage to equipment
- A center cushion release mechanism

REAR FACING OUTER SEAT MOUNTING

Each rear facing outer seat shall be mounted facing the rear of the cab.

FORWARD FACING CENTER SEAT

Two (2) forward facing center crew area seat(s) shall be 911 Seats Incorporated XL, wide series flip bottom seat(s).

The seat(s) shall also feature a 21-inch-wide XL comfort cushion including Seats Incorporated exclusive EVC (elastomeric vibration control), easing tailbone pressure, enhancing comfort, and reducing vibration by up to 50%. This system has Seats Inc's D2 (dual density) foam combining a soft topper foam pad further enhancing comfort, and a high-density bottom foam base to promote longevity. Seat to include wide comfort back with contoured foam.

The seat(s) shall have a 7-year manufactures warranty, no exception.

Cushion reinforced with French seaming and is NFPA compliant with an occupancy sensor

Belt Orientation- LH & RH to Door

SEAT BELT SINGLE RETRACTOR

The seat shall feature 3-point ABTS (all belts to seats). The single retractor seat belt shall feature Ready Reach to ensure that the seat belt is easy to see and grab while in full turnout gear.

SEAT BACK

The seat back shall include a Seats Incorporated Halo mechanical self-contained breathing apparatus (SCBA) bracket. The Positive Locking Mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall be third Party tested to ten (10) times the force of gravity.

The bracket shall include –

- Plastic-dipped rings designed to fit the full range of bottle diameters
- Vertical height adjustment to accommodate different bottle heights
- An easy achieved safe lock without risking damage to equipment
- A center cushion release mechanism

SEAT MOUNTING FORWARD FACING CENTER

The forward-facing center seats shall be installed facing the front of the cab.

SEAT FRAME FORWARD FACING ENCLOSED

The forward facing center seats shall include an enclosed seat box which is located and installed on the rear wall.

The seat frame shall be constructed of no less than 5052-H32 .19" thick aluminum plate.

SEAT FRAME FORWARD FACING ACCESS

The seat frame shall include two (2) cutouts one on each side of the seat box for access. Each cutout shall be in the outboard position facing the rear crew doors.

SEAT COMPARTMENT FINISH

The seat frame shall be finished to match the interior finish of the cab.
Exterior Grab Handles 18" Aluminum
Exterior Grab Handles Bare Aluminum w/ Lighting

EXTERIOR GRAB HANDLES

One (1) 18” exterior assist handle shall be mounted behind each of the cab doors. The grab handle shall be made of 1.25” diameter aluminum to enable non-slip assistance with a gloved handy. The handle shall feature red LED lights which shall illuminate when the respective door is opened. The handles shall be mounted to the cab with nutserts. No Exception.

GRAB HANDLE LIGHT ACTIVATION

The grab handle lights shall activate when the park brake is engaged.

CAB FASCIA

The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum. This design shall feature:

- A super structure which is fully welded to the cab, for a seamless and robust integration
- Thermoformed headlamp bezels, constructed of impact resistant, polycarbonate composite which is vacuum metalized to eliminate pealing and bubbling of a chrome type film or plating
- Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility

FRONT GRILLE

A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- Fabricated construction for superior strength and durability
- Stainless Steel mirror finish for a distinctive appearance
- Up to six (6) warning light locations along the mid bar for a variety of warning light combinations

LIGHT BEZEL

The front grille shall include two (2) wing light bezels. The bezels shall be constructed of a stainless material and shall be capable of holding one (1) 4” x 6” warning light in each bezel.

GRILLE LOGO

The front grille shall include a Rosenbauer logo.

FRONT GRILLE INLAY

The front grille shall include a honeycomb inlay of steel, painted black, which shall provide air flow to through the grille and provide a sporty, muscular appearance to the front of the apparatus.

The horizontal bars shall be overlaid with polished stainless steel strips.

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removable mesh grille panel:

- Engine oil dipstick
- Engine coolant sight glass
- Power steering fluid dipstick
- Windshield washer fluid

The following fluid fills shall be located behind the tiltable and/or removable mesh grille panel:

- Engine oil
- Power steering
- Windshield washer fluid

Proposals including access to fluid checks through the tunnel or by raising the cab shall not be considered.

LED HEADLIGHTS

A set of 4 Fire Tech 4X6 LED Headlights shall be provided. The kit shall consist of 2 fixtures which operate as SAE VOR "high/low" beams, and 2 fixtures which operate as SAE VO "high-only" beams. All 4 headlights shall have a SAE "P" parking lamp halo surrounding the driving beams, which shall be energized any time the vehicle park brake is set. Optically, on the high/low headlight, an articulated set of elliptical optics must be used to illuminate the foreground while operating in "low" beam mode. The lens of the high/low beam headlight shall be marked "DOT VOR SAE HL P 16." The lens of the high-only beam shall be marked "DOT VO SAE HL P 16." All circuits of the headlights shall be designed to operate from 9-32v DC.

All 4 fixtures must be manufactured such that the internal pressure of the headlight remains constant regardless of operating temperature. The housing shall be equipped with a mechanically fastened GORE PolyVent. Similar functioning vent materials affixed to the housing using adhesive shall not be acceptable for substitution.

The headlights shall be installed, wired, and aimed, in accordance with FMVSS108. The manufacturer of the headlights shall warrant the headlights against defects for the life of the apparatus.

The headlights shall be warranted against failure and condensation accumulation by HiViz for the life of the apparatus.

HEADLIGHT FLASHER

The LCS electrical system will directly control the high beam headlamps, when enabled the LCS electrical system shall allow the high beams to flash alternately from left to right.
Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The alternating high beam headlamp switch shall be located on the LCS display.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia in the upper buckets, on each side of the cab grille.

104 OS, 105 OS, and 104 DS, 105 DS

FRONT TURN SIGNALS

Two (2) Whelen M6 LED square, front turn signal assemblies shall be provided. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

TURN SIGNAL LOCATION

The turn signals shall be located on the front fascia directly below the headlights, one on each side of the cab grille.

106 OS & DS

FRONT MARKER LAMPS

The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements.

SIDE MARKER LIGHTS

Two (2) LED side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlight and marker lights shall be activated through a switch on the driver's panel.

CAB FENDERS

The cab wheel wells shall have full width, 14-gauge 304 polished, stainless-steel cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring 2.5" wide. The inner liner shall be installed with 410 stainless-steel hardware that has been coated with black zinc oxide.

COMMANDER LOGO

A COMMANDER logo shall be installed on each side of the chassis cab.

FRONT MUD FLAPS

The cab and chassis shall be provided with rubber front mud flaps with the Rosenbauer "R" logo.

CAB TILT SYSTEM

The cab shall be a full tilt style. A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves. The cab tilt pump shall be mounted on the right-hand side of the chassis frame in front of the batteries below the frame. The mounting bracket shall be Hot Dipped Galvanized.

The dual lift cylinders shall lift the cab 45 degrees from a horizontal plane facilitating easy engine maintenance. The chassis engine shall be able to be removed if required without tilting the cab beyond 45-degrees.

The center line of the chassis cab tilt shall be a minimum of 76" from the center line of the front axle, providing a large corridor between the cab and front tire for maximum workspace and accessibility to the fan, fan belt, fan drive, air compressor, power steering pump, alternator, and air filter.

The tilt angle shall allow access to the engine and area under the cab without contacting any components mounted to the gravel shield.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics.

The front cab pivot assemblies shall be a 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cylinders shall include blocking valves (velocity fuses) which prevent motion when no control buttons are pushed. In the event of a hydraulic system failure, the valves shall retain the fluid in the cylinders.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures. The stay arm shall be safety yellow for high visibility so that it is easy to see whether the arm is in place or not. No Exception

All mounting points shall be bolted directly to the frame rail.

The cab lift safety system shall be interlocked with the parking brake. The cab tilt mechanism shall be active only when the parking brake is set, and the battery master switch is in the on position. If the parking brake is release, the cab tilt mechanism shall be disabled.

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system.

A warning light shall illuminate in the cab instrument panel to indicate whenever the cab is not fully latched in the locked down position, and the parking brake is released.

CAB TILT LIMIT SWITCH

An adjustable cab tilt limit switch shall be included with the cab tilt system. The switch shall effectively limit cab's travel to avoid impact with bumper mounted items, or station ceiling clearance, while being tilted.

There shall be a safety bar to hold the cab at the new adjusted height for additional safety.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.
Bus Style Mirrors

REARVIEW MIRRORS

The cab exterior shall include Ramco bus style mirrors, one (1) mounted on the drivers' door and one (1) mounted on the officer's side front cab corner radius below the windshield.

The driver's side mirror shall be model CRM-310-1750-TPHCHR. The mirror head shall be injection molded chrome plated ABS plastic that measures 9.5" wide x 17.5" high and is mounted with a polished die-cast aluminum arm.

The officer's side mirror shall be model CRM-310-1752-A18-TPHCHR. The mirror head shall be injection molded chrome plated ABS plastic that measures 9.5" wide x 17.5" high and is mounted with a 18" long polished cast aluminum arm.

The mirrors shall feature an upper heated remote convex glass with a lower heated remote flat glass. The mirror control switches shall be located within easy reach of the driver. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounting reducing vibration. The mirrors shall be corrosion free under all weather conditions.

REARVIEW MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the rearview mirrors remote function. The driver panel shall also include a switch activating the mirrors to be heated.

CAB TWO TONE PAINT

The cab surface shall be thoroughly washed with grease cutting solvent (PPG DX330) prior to any sanding. The cab surface shall then be sanded and minor imperfections filled and sanded. The prepared surface shall then be washed again with (PPG DX330) to remove any contaminants from all surfaces to be painted.

The first coating to be applied shall be a pre-treat epoxy primer (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be a polyurethane primer resurfacing agent (PPG F4936). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG FDG polyurethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage polyurethane shall provide a UV barrier to prevent fading and chalking.

The cab shall then be painted with the specific color designated by the customer with a minimum thickness of 2.00 mils of finished paint, followed by a clear top coat not to exceed 2.00 mils.

CAB PAINT UPPER

The upper or secondary cab color shall be PPG _____ color and _____ number.

Paint Code:

Paint Color: WHITE

CAB PAINT LOWER

The lower or primary cab color shall be PPG _____ color and _____ number.

Paint Code:

Paint Color: RED

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet on the cab which shall start at the grille under the wings and travel 6" below the cab windshield and approximately 5" under the driver, passenger, and crew door windows.

CAB UNDERCOAT

The cab shall have an undercoat applied prior to the cab being set on the running gear. The under coat shall be a waterborne, one-component, air dry undercoat formulated to prevent chipping, cracking, and marring of painted or unpainted surfaces after exposure to high impact sand, gravel or other abrasive materials. It shall also have high corrosion resistance.

PAINT SPRAY OUT

The customer shall be supplied with a paint spray out of their chosen color(s) for approval prior to the chassis cab exterior being painted.

FRONT AXLE

The Hendrickson Steer Tek front axle beam shall be rated to carry 23,000 lbs. and consist of a fabricated box cross section construction with 100ksi plate and a continuous beam architecture to minimize stress points for added durability. The box shaped cross section resists horizontal, vertical, and twisting forces more effectively than traditional I-beam axles while helping to reduce dynamic camber and toe changes therefore a traditional I-beam axle shall not be considered. The axle shall incorporate a removable kingpin feature for ease of kingpin

serviceability. The knuckles shall allow for compatibility with disc brakes mounted at the 12-o'clock position and with drum brakes and allow for wheel cut up to 45 degrees. They shall also utilize premium kingpin bushings and seals to provide enhanced protection from the elements to improve bushing life.

The axle shall have a magnetic drain plug in the hubs.

The axle shall be warranted for five (5) years or five hundred thousand (500,000) miles, whichever comes first. No Exception.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SUSPENSION

The suspension shall consist of multi-leaf parabolic springs with double wrapped front eye that are packaged within an integrated clamp group that allows for ease of OEM assembly on to the axle beam and reduced part count. The clamp group bolts are tightened on the top of the clamp group opposed to the traditional U-bolt on the bottom making it easier to access with a torque wrench for servicing. The spring shall also include a lower shock attachment with an upturned eye. The springs will contain threaded pin bushings to allow simplification of spring alignment as well as long service life and improved ride quality. The suspension and spring geometry will be optimized to provide improved bump steer and Ackermann.

Two ZF Sachs twin-tube shocks shall be provided with the front suspension assembly. The shocks shall be specially developed for parabolic leaf springs with a digressive characteristic curve using a patented piston system. The shocks shall feature multi-stage piston and base valves.

The combination of valves shall achieve the desired damping characteristics that are ideal for the application. The suspension shall be rated for a minimum of 22,800 lbs. No Exception.

POWER STEERING GEAR WITH ASSIST

The power steering gear shall be a TRW model TAS 85 and shall include the following:

- A balanced, hydraulic, positive displacement, sliding vane power steering pump which is gear driven from the engine
- One-piece, 2" diameter drag link for maintaining consistent wheel alignment resulting in less maintenance.
- The steering gear shall be mounted on a plane that is at a 9-degree angle in relationship to the center plane of the chassis. This mounting technique is designed to reduce the

operating angle of input steering shafts. A more direct, responsive, and smoother handling vehicle will result from these unique design characteristics.

- A certified torque and geometry study by TRW shall be available upon request.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to ensure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the apparatus manufacturer.

Alignment documentation shall be available upon request.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 45 degrees to the left and right.

STEER TIRES

The steer tires shall be Michelin 425 65R 22.5 20PR "L" tubeless radial XZY3 mixed service tread.

The steer tires shall feature:

- A stamped load capacity of 22,800 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch

TIRE BALANCING

All tires shall contain counter acting balancing beads. Rim mounted weights are unacceptable, no exceptions.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.5-inch x 12.25-inch polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors. The disc brakes shall be provided with visual wear indicators.

The front brakes shall include brake chambers supplied by Meritor and shall be approved per application.

STEERING COLUMN AND WHEEL

The cab shall include a Douglas Atotech steering column. The steering column shall feature an 18", four (4) spoke steering wheel located at the driver's position; a five (5) position tilt and 2.25" telescopic adjustment. The steering wheel shall be provided with a black vinyl cover with foam padding and a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch. The steering column shall also incorporate a steering angle sensor.

The chassis shall include dual electric 12-volt horn with a minimum of 110 decibels.

REAR AXLE

A Meritor RS-30-185 driving axle shall be incorporated as the rear axle for the chassis.

The axle shall feature:

- Rated capacity of 33,000 pounds
- Heavy duty Hypoid gearing for longer life, increased strength, and quieter operation
- Industry-standard wheel ends for compatibility with drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage
- Rigid differential case for high axle strength, and reduced maintenance
- Rugged Dependability
- Rectangular shaped, hot formed housing with a standard wall thickness at spring seat of .56" for extra strength and rigidity
- A magnetic plug
- 5-year warranty

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated at 33,000 pounds based on the capacity of the brakes and rear tires.

REAR BRAKES

The rear brakes shall be Meritor 16.50" X 8.63" S-cam drum type.

The rear brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

REAR AXLE DIFFERENTIAL CONTROL

The rear axle shall include a driver controlled differential lock. This shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH.

REAR AXLE DIFFERENTIAL CONTROL ACTIVATION

The rear axle driver controlled locking differential control shall be activated through LCS display.

REAR TIRES

The rear tires shall be Michelin 315/80R 22.5 20PR “L” tubeless radial X Line Energy Z highway tread.

The rear tires shall feature:

- A stamped load capacity of 33,080 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 130 pounds per square inch

TIRE BALANCING

All tires shall contain counter acting balancing beads. Rim mounted weights are unacceptable, no exceptions.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, heavy duty, 22.50-inch X 9.00-inch polished aluminum wheels with Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

VALVE STEM EXTENSION - SINGLE AXLE

To allow for easy checking and inflation of the rear inner tire, it shall be equipped with a multi-layer valve stem extension. The layers shall be as follows: starting from the inner to outer layer - a stainless-steel metal core, an air tube, a stainless-steel jacket, a protective cover.

VEHICLE TOP SPEED

The top speed of the vehicle shall be programmed at approximately 65 MPH +/-2 MPH at the governed engine RPM.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a minimum of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. The system shall include an anti-compounding feature. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall activate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic

monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel.

A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

The Meritor Wabco ABS and ESC system shall come with a three (3) year/300,000-mile parts and labor warranty.

w/ air manifold
NOT AVAILABLE on Tillers

MUD / SNOW SWITCH

A momentary control shall be provided and properly labeled "mud/snow." The control shall be a button on the LCS display. When the button is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition, the ATC light shall blink continuously notifying the driver of activation. Pressing the button again shall deactivate the mud/snow feature.

Switch will be on screen in LCS Trucks

AIR TANK BRACKETS & STRAPS

The air tank(s) shall be mounted to the frame rail with brackets that are hot dipped galvanized thereby creating a barrier and cathodic protection from corrosion and eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a

period of time due to nicks, chips and corrosion. Powder coated or painted air tank brackets shall not be accepted. No exception.

All of the air tank straps shall be plastic coated stainless-steel cable. No Exception.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted on the driver's side dash to the right of the steering column within easy reach of the driver.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 Plus air dryer with an integral 100-watt heater with a Metri-Pack sealed connector. The system shall have an integrated purge volume and integrated governor.

The system shall have the following features:

- Premium desiccant provides greater water adsorption
- Replaceable spin on cartridge for simple maintenance
- Compact light weight design
- Pressure relief safety valve
- Turbo cut-off valve for boosted compressor applications
- Service components are external for easy replacement
- Common service components proven for reliability and quality
- Integrated with the air governor.

MOISTURE EJECTORS

Manual pet-cock type drain valves shall be installed on all reservoir tanks in the air supply system.

AIR SUPPLY LINES

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. The primary (rear) brake line shall be green, the secondary (front) brake line orange, the parking brake line yellow and the auxiliary (outlet) will be black, in accordance with SAE standards. No Exception.

Brass push-lock type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AIR INLET CONNECTION

An air connection for the shoreline air inlet shall be supplied.

PLUMBING AIR INLET CONNECTION

The air inlet connector shall be plumbed to the air system with a check valve to prevent air from escaping through the inlet connector.

AIR INLET LOCATION

The air inlet shall be located on the driver's side of the cab above the wheel well.

locate behind auto eject
206 DS

FRAME

The chassis frame shall consist of two (2) “C” style parallel rails, constructed of high strength low alloy and shall feature the following:

- A Stenx **MODEL 110XF** 10.19” high by 3.63” deep cold rolled steel frame or equivalent.
- .38” thick flange
- Inner channel measuring 9.31" high x 3.25" deep x .25" thick
- The 10.19” frame height shall be maintained throughout the entire length of the frame to allow for maximum storage capacity for the entire apparatus.
- If frame rails that are larger than those specified are to be utilized, the maximum height of each frame rail shall not exceed 10.25” at any point on the frame rail. This will ensure the lowest possible vehicle center of gravity allowing maximum stability as well as providing the lowest body height possible.
- Frame rail shall have a consistent frame web throughout the entire length.

- The entire frame rail design shall be manufactured in the United States of America and readily available on the aftermarket.
- Grade 8 Structural fasteners, Huck bolts shall not be acceptable. No Exception.
- The hardware used for the chassis shall be corrosion resistant. The process shall be dip-spin-bake coated with two coats of zinc/aluminum metal flake coating in an inorganic binder. Coating one is to be zinc flake and coating two is to be aluminum flake. The zinc flakes sacrificially corrode to protect the base metal. The aluminum flakes prolong the life of the zinc. Salt fog test life, based on ASTM B117 on unassembled fasteners, is 1000 hours to red rust. The same test on assembled fasteners is 750 hours to red rust. The two-step coating is RoHS compliant as it eliminates the hexavalent chromium used in the passivation of electroplated zinc coatings to create yellow zinc (zinc dichromate). The elimination of the zinc plating also greatly reduces the likelihood that hydrogen embrittlement will occur. Hydrogen embrittlement is a side effect of electroplating that reduces toughness and can lead to fracture. No Exception
- Manufacturer's lifetime warranty

The frame ratings shall be as follows:

- 110,000 PSI minimum yield strength high strength low alloy steel
- Minimum Resisting Bending Moment (RBM) of 2,810,000-inch pounds per rail

To avoid frame cracking and failure over time, the top flange of the frame adjacent to the engine installation shall have a tapered design. Notches for engine components shall not be accepted due to fatigue and the potential for cracking. No Exceptions

UNDER-FRAME REINFORCEMENT

An under-slung frame reinforcement shall be installed below the frame rails in the transmission area to increase the vertical rigidity of the frame.

The under-frame reinforcement provides:

- Enhanced handling
- Improved ride quality
- Increase resistance to frame and cross member fatigue
- Enhanced vehicle stability providing improved safety to occupants

CROSS MEMBERS

There shall be a minimum of seven (7) steel plate cross members installed on the apparatus.

- 50,000 psi minimum yield strength steel plate cross members
- Manufacturer's lifetime warranty to match frame warranty. No Exceptions.

- Installed with one-piece cross member gusset to maximize vertical strength and minimize cross member flex
- Crossmembers can be inverted when required to allow for PTO drive line installation without the need for notching or modifying the cross members in any way. No Exceptions.

FRONT FRAME EXTENSION

A single piece 80,000 PSI steel extension shall be installed on the front of the frame rails.

- Reduces frame flex which translates into improved vehicle handling and ride quality
- Designs using multiple piece, bolt together extensions will not be acceptable since they are prone to more flexing, possible frame failure and cab cracking
- Allows radiator to be removed through the bottom of the frame extension without tilting the chassis cab
- Minimizes damage to the chassis cab in the event of frontal impact accident
- Maintains structural integrity of the chassis frame rails while attaching bumper extensions of varying lengths
- Splayed or notched frame rails and/or extensions shall not be accepted
- Provides foundational strength and stability of the cab tilt system which provides superior access to engine and cooling components

FRAME FINISH

Prior to assembly, each frame rail section and cross members shall be hot dip galvanized. The galvanizing process will permeate each frame section to prevent rust and corrosion and not be merely an applied coating. The galvanized frame sections shall be provided in the natural finish eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after an amount of time due to nicks, chips, and corrosion.

Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete frame sections and cross members shall be immersed in molten zinc; except for the cross member that contains the engine mounts. Through diffusion, the zinc shall bond to the steel at the molecular level. The resulting zinc coating shall provide a barrier that shields the steel from the environment.

FRONT FRAME EXTENSION FINISH

The front frame extension shall be hot dipped galvanized to resist weather, dirt and other corrosive material.

Proposals offering powder coated or painted frames shall not be accepted. No Exceptions.

FRAME GALVANIZING WARRANTY

Rosenbauer Motors, LLC hereby warrants the galvanized frame rails shall be warranted for a period of twenty 20 years and includes the following coverage:

- The galvanized surfaces of the frame rails and cross members shall be free from corrosion caused by dissimilar metals, adhesion, blistering or peeling.
- The galvanized surfaces of the frame rails and cross members shall be free from any corrosion perforation.

Under this warranty Rosenbauer Motors, LLC agrees to repair or refinish any galvanized surface that has been found to have a defect caused by defective manufacturing methods or galvanized material where there is no indication of abuse, neglect, unusual or other than normal service providing that such item or items are, at the option of Rosenbauer Motors, LLC, made available for our inspection at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within twenty years from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to a defect caused by defective manufacturing methods or galvanized material selection. Written authorization for repair or item replacement must be sought from Rosenbauer Motors, LLC customer service prior to the repair or item replacement occurring.

Coverage Period
0 – 10 years = 100%
11 – 15 years = 50%
16 – 20 years = 25%

This warranty shall not apply to or cover:

- Normal maintenance services include cleaning and repair of surface corrosion caused by normal road salt/chemicals or debris contacting the frame rails and cross members.
- Damage to the galvanized frame rails caused by exposure to severe environmental or chemical conditions or acidic environment.
- Any item that has been repaired, replaced, or altered by a facility not approved in advance by Rosenbauer Motors, LLC, or in a manner which, at Rosenbauer Motors, LLC discretion, may adversely affect the safe operation or durability of the vehicle or item.
- Special, incidental, or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge, lack of normal or required maintenance or adjustments, fire or acts of God.

This warranty is in lieu of all other warranties expressed or implied, and all other obligations or liabilities on our part. This warranty does not supersede the structural warranty We neither assume nor authorize any person to assume for us any liability or make any alteration to this warranty in connection with the sale of our apparatus unless expressly given in writing by Rosenbauer Motors, LLC, 5190 260th St. Wyoming, MN 55092.

NOTE: Surety bond, if required, will cover the standard one-year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

BUMPER

The chassis shall feature a standard, two (2) rib 12" high by 102" wide wrap around style bumper constructed from highly polished, 10 gauge, 316 stainless steel.

Integral stainless steel bumper "wings" shall extend from the bumper to the cab.

The bumper shall be mounted to an eighteen inch (18") long chassis frame extension.

A contoured apron/gravel shield fabricated from NFPA compliant, slip-resistant polished aluminum shall enclose the area between the bumper and the cab.

FRONT BUMPER COMPARTMENT

A recessed fire hose compartment constructed from smooth aluminum shall be installed in the center of the front bumper extension. Water drain holes shall be provided in the bottom.

BUMPER COMPARTMENT DOOR

The front bumper compartment shall be equipped with a raised aluminum treadplate door for the full width of the compartment.

COMPARTMENT LIGHT

One (1) vertically mounted LED strip light shall be installed inside the compartment. The light shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup and be approximately 30" in length.

MOUNTING

The compartment light shall be mounted in the door jamb to illuminate the compartment interior.

TOW HOOKS

Two (2) tow hooks shall be mounted to the bumper extension under the bumper towards the forward section of the extension. The tow hooks shall be steel and shall be powder coated black. Engine Placement

ENGINE

A Cummins X12 12.0-liter diesel fueled; turbo charged engine shall feature the following:

- One of the highest power to weight ratios in its class
- Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments
- Improved cooled EGR system
- 720 cubic inches of displacement
- High pressure common rail fuel system producing a precise quantity of fuel at ultra-high pressures
- Fully integrated, robust electronic engine controls
- Electric fuel lift pump. No Exceptions.
- Standard drain plug

The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall be filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication.

The engine shall be EPA certified to meet the 2021 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an original equipment manufacturer installed oil drain plug.

The engine shall include programming which will govern the top speed of the vehicle.

ENGINE PLACEMENT

The engine shall be a maximum of 36" from the center line of the front axle to the front face of the engine block. The engine valve cover shall be a maximum of 23" from the top of the frame.

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling. More weight out in front of the front axle can cause a “fulcrum effect” and cause unsafe “bump steer” conditions.

The engine shall be mounted in a position that provides for the lowest possible height of the interior engine tunnel. An engine tunnel height from the floor of the chassis cab shall be no more than 21" high inside the cab.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Cummins branded Wabco compressor which shall be capable of producing 25.4 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increase the system's component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be integrated in the air dryer assembly.

CHANGE POWER STEERING TO CORRECT OPTION FOR X12

NO GVWR OVER 77,000# W/O ENGINEERING APPROVAL

Cummins X12 & X15 Surcharge

HORSEPOWER

The engine shall have 500 horsepower at 1800 RPM, with a governed speed of 2000 RPM.

The engine shall have 1695-foot pounds of torque at 1000 RPM.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled Viscous fan clutch drive.

The fan clutch shall automatically engage in pump mode (when applicable).

FAN CLUTCH

The clutch fan shall automatically engage in pump mode (when applicable).

AUXILIARY ENGINE BRAKE

A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:

- Activate upon 0% accelerator when in operation mode and activate the vehicle's brake lights.

TRANSMISSION PRE-SELECT

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed. The transmission shall assist the secondary braking system, thereby slowing the vehicle.

AUXILIARY ENGINE BRAKE CONTROL

An auxiliary engine brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/medium/high virtual switch on the Weldon Vista display. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle will be set at 1250 RPM. The high idle will be operational only when the parking brake is applied, and the truck transmission is shifted into neutral.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. The high idle shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output.

This device shall operate only when the control switch is activated, and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to engage manually

through a virtual switch in the LCS Display, or automatically re-engage when the brake is set, and the transmission is placed in neutral. A LCS Display shall indicate the high idle speed control is active.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the fascia.

The filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame.

This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The intake shall also feature a cyclone style water separator to remove unwanted moisture from incoming air.

The engine shall include an air intake filter which shall be bolted to the frame and located under the front of the cab. This dry type of filter shall ensure dust and debris is safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The filter must have a capacity of no less than 1350 cubic feet of air per minute. The filter paper media must be of a flame retardant treated material. An electric air filter restriction indicator shall also be included with the system.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a one-piece diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards.

The selective catalytic reduction catalyst shall utilize a diesel exhaust fluid solution consisting of urea and purified water to convert nitrogen oxide into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system between the DPF and SCR chambers.

The system shall utilize 0.065-inch-thick stainless steel exhaust tubing between the engine turbo and the DPF.

The after-treatment canister through the end of the tailpipe shall all be connected with zero leak gasketed clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires with an exhaust gas diffuser.

The diffuser shall lower exhaust gas temperatures during the regeneration cycle.

DIESEL EXHAUST FLUID TANK

There shall be a molded cross linked polyethylene tank for the Diesel Exhaust Fluid (DEF). The tank shall have a capacity of not less than five (5) usable gallons (18.92 Liters) and shall be mounted on the left-hand side of the chassis frame in front of the batteries below the frame. The mounting bracket shall be Hot Dipped Galvanized.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

DIESEL EXHAUST FLUID TANK

There shall be an access door provided in the top rear step of left side crew area for access to the DEF tank.

ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gases at the exhaust outlet.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

DIESEL PARTICULATE FILTER CONTROLS

Provide DPF system status annunciation indicator lights, lights shall be installed on driver dash to alert driver when regeneration is needed and when DPF is in an active re-generation cycle.

Warning systems shall provide DEF low level warning.

Driver's dash shall be provided with two (2) controls for the Diesel particulate filter; one (1) manual regeneration switch to activate a regeneration cycle manually when passive burn is unobtainable due to driving conditions; and one (1) Regen "Inhibit Switch".

Activations will be provided in the service screen of the Driver Display for One LCS trucks.

The switches shall be located in a covered location for V-Mux and P2P trucks.

ENGINE COOLING SYSTEM

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements.

The system shall include and feature the following:

- A vertically stacked charge air cooler producing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable. No Exceptions
- The charge air cooler and radiator shall measure not less than 1214 square inches
- A surge tank with a low coolant probe and capable of removing entrained air from the cooling system, with built in sight glass
- Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance
- Mounts allowing the entire radiator to drop through the frame for service when needed. No Exceptions
- Engine placement shall provide a minimum of 8” between the engine fan and radiator to maximize the airflow and cooling of the engine.
- A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. No Exception.
- The coolant filter shall be provided with two (2) shut off valves, one (1) one inlet and one (1) outlet. No Exception.
- Cooling system shall be tested and certified by the engine manufacturer

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include constant tension spring clamps.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees F.

Supplemental coolant additives (SCA) are not required as this is part of the extended life coolant makeup.

ADDITIONAL COOLANT SHUT OFF VALVE

An additional coolant shut off valve with connection shall be installed in the chassis coolant lines with a connector. This shall allow for the installation of an additional heater such as a pump compartment heater without draining the coolant system.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. This pump heat exchanger shall circulate water from the fire pump to the heat exchanger thereby reducing the temperature of the coolant for the engine. The heat exchanger shall be designed to prohibit water from the fire pump from encountering the engine coolant.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing; one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

The transmission shall include two (2) internal oil filters and Allison approved transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The Gen V transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
6th	0.64:1 (if applicable)
Rev	4.80:1

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic oil drain plug.

AUTOMATIC NEUTRAL

The transmission shall be provided with an automatic neutral. When the parking brake is applied the transmission automatically returns to neutral.

TRANSMISSION FLUID

The transmission shall include two (2) internal oil filters and Allison approved transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

TRANSMISSION SHIFT SELECTOR

An Allison 6th GEN pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.

The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required.

PTO LOCATION

The transmission driven power takeoff (PTO) shall be mounted in the 1:00 o'clock position.

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button.

TRANSMISSION PROGRAMMING

The EVS Vocation Package Number 198 for the fire service for this apparatus as a Pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector which requires re-selecting the drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. The transmission will detect the pump engaged signal and automatically select or deselect fourth gear lock-up. These circuits shall be used allowing the vehicle to operate in the fourth range

lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A nine (9) pin diagnostic connector will be provided.

The trans module shall contain the following circuits:

FUNCTION ID	DESCRIPTION	WIRE ASSIGNMNET
C1	PTO Drive Interface Output 1	142
J	Fire Truck Pump Mode (4th Lockup)	122/123
G1	PTO Drive Interface Output 1	130
C	Range Indicator	145 (4th)
	Signal Return	103

DRIVELINE

All drivelines shall be heavy duty metal tubes equipped with Spicer 1810 series universal joints.

The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS1065 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water-in-fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

A secondary fuel filter shall be included as approved by the engine manufacturer.

FUEL SYSTEM

The fuel tank shall have a capacity of fifty (50) gallons/one hundred eighty-nine (189) liters.

The tank shall offer:

- Beveled Rear Corner to allow for better angle of departure.
- A vent port which will facilitate venting to the top of the fill neck for rapid filling without any “blow-back”

- Two (2) 2” NPT fill ports for left-and-right-hand fill with a .5” NPT drain plugs centered side to side, 9" from the front of the tank
- A roll over ball check vent for temperature related fuel expansion and draw
- A design including dual draw tubes and sender flanges
- A baffled design which shall be constructed of steel
- A black Powder Coated exterior to ensure corrosion resistance

The fuel tank shall be mounted below the frame, behind the rear axle. There shall be two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank, allowing the tank to be easily lowered and removed for service purposes.

The strap hanger material shall be stainless-steel. No Exceptions.

For isolation of vibration and movement, rubber isolating pads shall be provided between the tank and the hanger strap assemblies. The tank straps shall be attached to rubber coated cross members which help isolate the tank from frame flex.

Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

All fuel lines shall be connected with steel fittings with all fittings pointed towards the right side (curbside) of the chassis.

The chassis fuel lines shall feature an additional 4’ of length provided so the tank can be easily lowered and removed for service purposes which shall be coiled and secured at the top of the tank.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black aramid braided lines with a fiber outer braid. The fuel lines are compatible with bio-diesel fuel blends and utilize reusable steel fittings.

FUEL SHUTOFF VALVE

Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL COOLER

The cross-flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located reward of the battery box, under the frame.

The fuel cooler shall incorporate a fan for improved heat transfer.

The fuel cooler shall be mounted to the frame using hot dipped galvanized brackets. Powder coated or painted brackets shall not be acceptable. No exception.

ALTERNATOR

The charging system shall include a 320-amp Leece Neville 12-volt alternator. The alternator shall include a self-excited integral regulator.

LCS ELECTRICAL SYSTEM

There shall be a 12-volt direct current single starting electrical system providing power to all components for the cab and chassis. The system shall feature:

- A Rosenbauer One LCS Multiplexed system
- 125°C high temperature, flame retardant loom
- All SAE wiring color coded and labeled as to its function
- Wiring which is cross link with 125°C insulation
- A suppressed system in accordance with SAE J551

Serviceable components in the electrical system will be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload.

General protection circuit breakers will be a combination of automatic and manual reset breakers. This will provide durability and capacity maximization of the electrical system. When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing may be used, as allowed by NFPA, to extrapolate results on updated systems.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

- SAE J1128 - Low tension primary cable
- SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J163 - Low tension wiring and cable terminals and splice clips
- SAE J2202 - Heavy duty wiring systems for on-highway trucks
- NFPA 1901 - Standard for automotive fire apparatus
- FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks, and buses
- SAE J1939 - Serial communications protocol
- SAE J2030 - Heavy-duty electrical connector performance standard
- SAE J2223 - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code
- SAE J561 - Electrical terminals - Eyelet and spade type
- SAE J928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed and have grommets or other edge protection where wires pass through metal. Wiring will be colored, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires using a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an

expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

- All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.
- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- A corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.
- Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.
- All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.
- All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

- SAE J1127 - Battery Cable
- SAE J561 - Electrical terminals, eyelets and spade type

- SAE J562 - Nonmetallic loom
- SAE J836A - Automotive metallurgical joining
- SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
- NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

- All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number.
- Splices will not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

SUMMARY OF LOAD MANAGEMENT SYSTEM

In the LCS electrical system there will be four pre-defined Load Manager Trigger points spaced apart in 0.4 Volt increments. Each vehicle function is preset to turn OFF if node voltage falls below a certain level. The trigger points are configured as shown below.

Load Manager Trigger Points:

1: 12.5-V Load Shed Region 1 (12.5 - 12.1 V)
2: 12.1-V Load Shed Region 2 (12.1 - 11.7 V)
3: 11.7-V Load Shed Region 3 (11.7 - 11.3 V)
4: 11.3-V Load Shed Region 4 (11.3 - 0 V)

When the voltage of a Load Managed device recovers back above the trigger point, there will be an additional 30 seconds before the Output channel is turned back ON. This buffering time is to ensure that the added load does not immediately pull the voltage back below the trigger point.

Below are the standard voltage managed outputs that will be triggered off at 12.1 V.

HVAC FAN MED
HVAC FAN HIGH
HVAC FAN LOW
AUX DEFROST FANS
A/C CONDENSER FANS RLY
A/C COMPRESSOR CLUTCH

DISPLAY

One (1) LCS display shall be located on the driver's side dash.

The LCS display shall feature:

- A 10" full color LCD touch screen
- A message bar displaying important messages requiring acknowledgement by the user
- Six (6) push button style controls on either side of the screen for function control
- Eight (8) push button style controls located below the screen for screen navigation
- Two Camera inputs for video feeds – use of video switchers can increase number of cameras
- There shall be an image which indicates any open cab door with a visual display.

The LCS display shall measure approximately 12.375" wide x 8.125" in height.

DRIVER SWITCHES

The driver switch panel to the right of the driver's position shall include one (1) row with up to six (6) backlit rocker switches with laser etched labels located under the LCS display.

Switch functions to be specified in shop notes.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event

- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Service Brake
- Engine Hours
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type A or B USB connection point, remotely mounted in the left side foot well of the cab. The latest software shall be available for download from the Weldon website.

SEAT BELT WARNING

With this option, the seat belt warning system will still be integrated and displayed in the LCS Control system. The system shall activate an individual warning indicator for each seat on the LCS Display.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also be activated when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have their respective seat belts fastened. Commander Digital Gauge Composite Dash

CAB INSTRUMENTATION

The instrumentation panel within the cab shall feature a digital display which shall include an information center, telltale indicator lamps, control switches, alarms, and diagnostics.

The gauges shall be easy to read including.

The instrument panel shall contain the following gauges and indictors:

- A programmable speedometer to read either 0 to 100 MPH or 0 to 100 KM/H
- An amber telltale lamp indicating the Check Engine
- An amber telltale lamp indicating MIL Engine Emissions System Malfunction
- A red telltale lamp indicating Stop Engine
- A tachometer gauge with 0-3,000 RPM
- A gauge to display the engine oil pressure with high and low-level indicators and stop engine alarm

- A fuel level gauge with a low fuel indicator and alarm
- An LED bar displaying 4 stages of the level for the Diesel Exhaust Fluid (DEF) with a refill indicator (when applicable)
- A voltage gauge with low voltage indicator
- A water temperature gauge with high water temp indicator and alarm
- A primary air PSI gauge including low air and high air warning displays
- A secondary air PSI gauge with low and high air warning indication

A diagnostic display, located in the lower left-hand side of the screen shall include digital readouts for the following:

- Odometer
- Transmission oil temp
- Engine oil temp
- Speedometer
- Engine hours
- Engine and transmission code
- Exhaust temp
- Engine coolant temp
- Engine oil PSI
- Turbo boost PSI
- Primary air pressure
- Secondary air pressure
- Engine load %
- Engine torque
- Battery volts
- Fuel level %
- Vehicle speed
- RPM
- DEF level (when applicable)
- Instant fuel economy
- Average fuel economy
- Engine hours
- Capable to record three trips, each shall include:
    - · Trip distance
    - · Fuel economy
    - · Fuel used
    - · Idle fuel used
- The screen shall also provide diagnostic capability

To promote safety, the following telltale indicator lamps will be integral to the digital display. The indicator lamps will be "dead-front" design that is only visible when active. The colored

indicator lights will have descriptive text or symbols. The following indicator lamps shall be located on the Telltale panel:

BLUE Indicator Lights
- High Beam Headlight

GREEN Indicator Lights
- Right Turn Indicator
- Left Turn Indicator
- Battery On (Always On with master switch)

YELLOW Indicator Lights
- Particle Filter Regeneration (DPF)
- Regeneration Inhibit (Switch Engaged)
- Air Intake Restriction
- High Exhaust System Temperature (HEST)
- Wait to Start (when applicable)
- ATC (Automatic Traction Control) (when applicable)
- Water in Fuel Air Bag Warning (when applicable)
- ABS

RED Indicator Lights
- Low Engine Coolant Level
- Air Bag Warning (when applicable)
- Check Transmission
- High Transmission Temperature
- Parking Brake

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Alarm silence: Any active audible alarm will be able to be silenced with a button on the screen, except the low air pressure alarm will not silence until air pressure is above 70 psi.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

DIAGNOSTIC PANEL

A diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership.

The diagnostic panel shall include:

- Engine diagnostic port
- V-Mux USB diagnostic port (when applicable)
- Diesel particulate filter regeneration switch (when applicable)
- Diesel particulate filter regeneration inhibit switch (when applicable)

The enclosed diagnostic panel, accessible through the HVAC access panel shall include:

- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (when applicable)

6 Battery System

BATTERIES

The single start electrical system shall include six (6) group 31 1000 CCA batteries.

The batteries shall feature:

- A 200-minute reserve capacity
- 4/0 dual path starter cables per SAE J541
- Heat-shrink and sealant encapsulated ends on the cables
- Maintenance free

BATTERY COMPARTMENTS

A well-ventilated, hot dipped galvanized battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted.

Each battery compartment shall feature:

- Hot dipped galvanized 3/16" steel construction.
- A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting
- A hinged hot dipped galvanized steel cover with two (2) magnets shall be utilized providing easy access to the batteries. No tools shall be required to gain access to the batteries.
- When in the open position, the hinged door shall rotate past the bottom of the battery compartment, allowing for a sweep out style floor and removal of the batteries, when necessary, without the inference of a lower lip. No Exceptions.

BATTERY CABLES

The starting system shall include cables which shall be protected by a 275-degree F, minimum high temperature flame retardant loom.

The cables shall be in a loom to help keep out dirt, dust and debris.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs installed in the forward most portion of the driver's side lower step.

The studs shall allow the vehicle to be jump started, charged, or the cab raised in an emergency in the event of battery failure.

POWER & GROUND STUD

An electrical distribution panel shall include two (2) power studs. The studs shall be a minimum of 1/4" and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40-amp battery direct load. One (1) power stud shall be capable of carrying up to a 15-amp ignition switched load. The two (2) power studs shall share one (1) 1/4" ground stud.

GROUND LIGHTS

Each door shall include a Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the cab step below each door.

Each light shall include a polycarbonate lens, a housing which is vibration welded and an LED head that shall be shock mounted for extended life.

GROUND LIGHT ACTIVATION

The ground lights shall activate when the park brake is engaged.

CAB STEP LIGHTING

One (1) LED light shall be mounted to the riser of the middle cab step, a total of eight (8) step lights for the cab, in accordance with NFPA.

Each light shall include a polycarbonate lens and shall be contained in a housing which is vibration welded with a LED head which shall be shock mounted. Each step light shall not be any larger than 3" in diameter.

STEP LIGHT ACTIVATION

The step lighting shall be activated by opening any of the cab doors on the respective side.

INTERIOR DOOR WARNING LIGHTS

The interior of each door shall include one (1) 15" Weldon Amber Direct Flash LED warning light mounted below the interior grab handle. Each light shall activate with a flashing pattern when the door is in the open position to serve as a warning to approaching traffic.

ENGINE COMPARTMENT LIGHTING

Two (2) LED lights shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.

STANDARD DOME LIGHT ACTIVATION

White dome light will turn on with open door, white and color dome lights can be manually turned on at the light head at any time or through the multiplex system, if equipped. Same activations shall be used for any added auxiliary dome lights.

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include a dual red and white LED lamp. There shall be one (1) light centered over each of the driver and officer's seats, and one centered over each crew door.

The clear lamp shall illuminate with the opening of each respective door with both the red and clear portions of the lamp activated by individual lighted switches on each lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen round LED light with a red lens clearly labeled "Do Not Move Apparatus". The flashing red light shall be 3.00-inches in diameter and shall be located centered left to right for greatest visibility. The light shall be interlocked for activation when either a cab door is not firmly closed, or an apparatus compartment door is not closed, and the parking brake is released. The warning light shall also be attached to folding equipment racks and light towers as specified.

NFPA requires the red light. NFPA 1901.13.11.1

AIR HORNS

Two (2) Hadley brand E-Tone air horns shall be provided. The air horns shall be 6" in diameter and 24" long. Each horn shall feature flared ends offering a pleasing appearance.

Locate furthest outboard

AIR HORN LOCATION

The air horns shall be located on the front bumper. One (1) shall be mounted outboard on the driver side and one (1) outboard on the officer side, so as not to interfere with any other components on the bumper.

ELECTRIC TRAFFIC HORN AND AIR HORN SELECTOR SWITCH

A selector switch shall be provided on the cab's dash that will allow the chassis steering wheel horn button to activate either the electric traffic horn or air horn system.

AIR HORN FOOT SWITCH

A foot switch shall be installed to activate the air horn system on the officer's side of the floor.

FRONT SCENE LIGHTING

The following scene lighting shall be located on the front brow of the cab:

BROW SCENE LIGHT

Two (2) Whelen Pioneer Plus Super LED model PFH2 dual lamp brow lights shall be mounted outboard, one each side, facing forward. The light shall draw 13 amps. The bulb shall be accessible through the front. The lamp head shall be approximately more than 3" deep by 4-5/8" high by 14" wide. Lamp head and brackets shall be powder coated white.

SCENE LIGHT SWITCHING

The one (1) front scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's LCS screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "FRONT SCENE".

AERIAL SPECIFICATION

78' THREE SECTION REAR MOUNT LADDER

Aerial Ladder Design and Construction

A 78' three-section steel rear mount aerial ladder shall be provided. It shall have a maximum height of 77' 10” at the top rung of the fly section at 75-degrees elevation. The horizontal reach from the top rung to the center of the turntable shall be 70' 8.6".

Operation on grades
The aerial shall be capable of being operated with full rated capabilities in any plane up to 5-degrees out of level with the turntable leveled as much as possible by placement of the outriggers. Operation beyond this limit shall be at the operator's discretion.

Extension And Retraction System
Two [2] 4" inside diameter cylinders, each with 2" outside diameter rods and a 60" stroke, are used in the extension and retraction system. The specified extension cylinders shall not exceed the specified length. The required length cylinders shall place the cylinder weight closer to the base of the aerial device. Smaller size cylinders are required since they are easier to handle for removal for service reasons. In addition, the specified shorter stroke cylinders provide less potential for damage to the rod by hitting an obstacle when extended.

The extension cylinders shall have counter balance valves mounted directly to them and shall extend and retract the aerial with a 4 to 1 cable cylinder arrangement from totally retracted to 75' at 75 degrees totally extended.

The extension and retraction system shall have four [4] pairs of galvanized cables. Mid-section cables shall have a .375" diameter and fly section cables shall have a .3125" diameter. The sheaves, in which the cables run on, shall be galvanized, no exception. A galvanized cable running on a galvanized sheave creates a natural lubricate allowing the cables to run more freely minimizing the wear on the cables.

Each of the cylinders, cables, and sheave assemblies shall be completely independent of the other system, so as to provide a safety factor wherein a failure of one assembly shall not affect the function and operation of the other assembly. Each set of cables shall be capable of operating the ladder in the event of a failure of the other.

There are no restrictions on the waterway as the ladder is extended and retracted

State-of-the Art Technology
The aerial device materials, parts, technology or procedures used in construction of the apparatus are subject to change at the manufacturer's discretion to provide "equal or better" products and must be in compliance to applicable NFPA #1901 standards and industry standard practice.

BASE SECTION
The ladder base section length shall be 28' 10", with inside dimension of 34.25"; distance between the top of the handrail and the centerline of the rungs shall be 23.875". The base rails shall be constructed with 100,000 PSI steel material and the handrails shall be constructed with 70,000 PSI steel material.

MID SECTION
The ladder mid-section length shall be 28' 11", with inside dimension of 28.375"; the distance between the top of the handrail and the centerline of the rungs shall be 19.875". The base rails shall be 70,000 PSI material and the handrails shall be 70,000 PSI steel material.

FLY SECTION
The ladder fly section length shall be 32' including the bolt-on egress, with inside dimension of 23.5"; the distance between the top of the handrail and the centerline of the rungs shall be 16.375". The handrails and base rails shall be 70,000 PSI steel material.

TECHNICAL DRAWINGS
Technical and engineering drawings shall be provided for the aerial ladder as follows: left side view, top view and rear view.

ELECTRICAL DRAWINGS
Technical and engineering drawings shall be provided for the 12 volt electrical system for the model of apparatus specified.

HYDRAULIC DRAWINGS
Technical and engineering drawings shall be provided for the aerial device hydraulic system.

AERIAL OPERATION INSTRUCTIONS
As required by applicable sections of NFPA #1901, operating instructions and demonstration of the aerial apparatus shall be provided at the purchaser's location. The aerial manufacturer shall provide these instructions and demonstration of the aerial apparatus.

Personnel providing the instructions shall be professionally trained by the aerial manufacturer prior to the delivery process. All costs of these instructions shall be borne by the bidder. The bidder shall notify the purchaser a minimum of 14 days prior to the instruction period. The bidder shall provide classroom instructions and operational instruction. The instructor shall provide the all necessary material to assure proper operation of the aerial device.

This instruction period shall be three (3) consecutive days at the purchaser's location.

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

MATERIAL AND WORKMANSHIP WARRANTY ONE (1) YEAR
TERMS AND CONDITIONS
Rosenbauer hereby warrants each new Rosenbauer Aerial to be free from defects in material and

workmanship for a warranty period of one (1) year starting on the date the vehicle is delivered to original purchaser. Under this warranty, Rosenbauer agrees to furnish any item or items to replace those that have been found to be defective in material or workmanship where there is no indication of abuse, neglect or other than normal service. Such an item or items, at the option of Rosenbauer must be made available for our inspection at our request and returned to our factory or another location designated by Rosenbauer. Transportation of such an item or items will be arranged and covered by buyer within thirty (30) days after the date of failure and within one (1) year from the date of delivery of the apparatus to the original purchaser, whichever occurs first. The inspection must indicate that the failure was attributed to defective material or workmanship. Authorization for repair or item replacement must be sought from Rosenbauer customer service department prior to repair or item replacement occurring.

This warranty is applicable only if the aerial device is serviced annually by an authorized Rosenbauer service facility. The cost of the annual service is the responsibility of the purchaser.

THIS WARRANTY SHALL NOT APPLY TO OR COVER THE FOLLOWING:

- Normal maintenance services or adjustments, including but not limited to, lubricants, cable adjustment, hoses, and other incidentals.
- Any item that has been repaired, replaced or altered by a facility not approved in advance by Rosenbauer, or in a manner which, at Rosenbauer's discretion, may adversely affect the safe operation or durability of the vehicle or item.
- Special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge, lack of normal or required maintenance or adjustments, exposure to corrosive agents, fire, severe environmental conditions or acts of God.

EXCLUSIONS OF DAMAGES BOTH INCIDENTAL AND CONSEQUENTIAL.

At no time shall Rosenbauer be held liable for any incidental, consequential, indirect, special and/or punitive damages whatsoever, whether coming from breach of contract, warranty, tort or equity. Such items shall include the chassis or other items sold by Rosenbauer, or their operation or their failure to operate, or defects herein, or any undertakings, acts or omissions related to, regardless whether Rosenbauer's knowledge of the possibility of any such damage.

Without limitation of the generality of the preceding statements, Rosenbauer categorically disclaims any and all liability for property and personal injury, damages, penalties for lost revenue and/or profit, loss of aerial or products and associated pieces of equipment, the expense of substituting chassis and/or products, or the out of service expenses, resulting from damages and/or delays, that creates down time expenses and/or create economic losses, or any third party claims for damages.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability

or make any alteration to this warranty in connection with the sale of our apparatus unless expressly given in writing by Rosenbauer.

NOTE: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

THIRD PARTY TESTING

The aerial ladder shall be inspected and tested by a third party. A non-destructive test shall be performed on each unit at a rate of 100% inspection by the Underwriters Laboratories inspector, exceeding the requirements applicable section of NFPA #1901 for new apparatus. All non-destructive procedures shall be fully documented and meet or exceed the requirements of applicable sections of NFPA #1901.

PERFORMANCE WATER FLOW TESTING

The waterway flow test shall be conducted by an accredited third party testing organization with certified results provided on delivery of the apparatus. If the aerial device is equipped with a permanent water system and has a rated vertical height of 110 ft (34 m) or less, standard model flow test data shall be provided to the purchaser.

If the water system has been modified from the standard model configuration, a new flow test shall be conducted to determine that the friction loss in the water system between the base of the swivel and the monitor outlet does not exceed 100 psi (700 kPa) with 1000 gpm (3748 L/min) flowing and with the water system at full extension.

A flow test shall be conducted on each vehicle to determine that the water system is capable of flowing 1000 gpm (3748 L/min) (or rating as specified in these specifications) at 100 psi (700 kPa) nozzle pressure with the aerial device at full elevation and extension.

Where the apparatus is equipped with a fire pump designed to supply the water system, the test shall be conducted using the onboard fire pump.

The intake pressure to the fire pump shall not exceed 20 psi (140 kPa).

AERIAL SECTIONS GALVANIZED & BASE SECTION PAINTED ONLY

Prior to assembly, each aerial ladder section shall be hot dip galvanized. The galvanizing process will permeate each ladder section to prevent rust and corrosion and not be merely an over-coating The galvanized aerial ladder sections shall be provided in the natural finish eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a period of time due to nicks, chips and corrosion resulting from hitting the ladder many times in use. The galvanized ladder shall reduce the maintenance requirement for grease once or twice a year, based on duty cycle.

The aerial ladder sections are galvanized inside and out, including base rails, hand rails, diagonals, rungs and K-Braces. This process eliminates the rusting, scratching or paint chips on

the aerial sections. Galvanizing has been recognized as an effective way to protect steel from corrosion.

Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete aerial ladder sections shall be immersed in molten zinc. Through diffusion, the zinc shall bond to the steel at the molecular level. The resulting zinc coating shall provide a barrier that shields the steel from the environment.

After the ladder sections are galvanized the base section only shall be properly cleaned and prepared for paint. The section shall be painted as specified by the Fire Department.

STRUCTURAL DESIGN WARRANTY TWENTY-FIVE (25) YEAR
TERMS AND CONDITIONS

Rosenbauer hereby shall warranty each new Rosenbauer aerial device to be free from structural failure caused by defective design and workmanship for a warranty period of twenty-five (25) years or 100,000 miles starting on the date the vehicle is delivered to original purchaser. Under this warranty, Rosenbauer agrees to furnish any item or items to replace those that have been found to be defective in material or workmanship where there is no indication of abuse, neglect or other than normal service. Such an item or items, at the option of Rosenbauer must be made available for our inspection at our request and returned to our factory or another location designated by Rosenbauer. Transportation of such an item or items will be arranged and covered by buyer within thirty (30) days after the date of failure and within two (2) years from the date of delivery of the apparatus to the original purchaser, whichever occurs first. The inspection must indicate that the failure was attributed to defective material or workmanship. Authorization for repair or item replacement must be sought from Rosenbauer customer service department prior to repair or item replacement occurring.

This warranty is applicable only if the aerial device is serviced annually by an authorized Rosenbauer service facility. The cost of the annual service is the responsibility of the purchaser.

THIS WARRANTY SHALL NOT APPLY TO OR COVER THE FOLLOWING:

- Normal maintenance services or adjustments, including but not limited to, filters, lubricants, cable adjustment, hoses, and other incidentals.
- Any item that has been repaired, replaced or altered by a facility not approved in advance by Rosenbauer, or in a manner which, at Rosenbauer's discretion, may adversely affect the safe operation or durability of the vehicle or item.
- Special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge, lack of normal or required maintenance or adjustments, exposure to corrosive agents, fire, severe environmental conditions or acts of God.

EXCLUSIONS OF DAMAGES BOTH INCIDENTAL AND CONSEQUENTIAL.

At no time shall Rosenbauer be held liable for any incidental, consequential, indirect, special and/or punitive damages whatsoever, whether coming from breach of contract, warranty, tort or equity. Such items shall include the chassis or other items sold by Rosenbauer, or their operation or their failure to operate, or defects herein, or any undertakings, acts or omissions related to, regardless whether Rosenbauer's knowledge of the possibility of any such damage.

Without limitation of the generality of the preceding statements, Rosenbauer categorically disclaims any and all liability for property and personal injury, damages, penalties for lost revenue and/or profit, loss of chassis or products and associated pieces of equipment, the expense of substituting chassis and/or products, or the out of service expenses, resulting from damages and/or delays, that creates down time expenses and/or create economic losses, or any third party claims for damages.

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

NOTE: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

PAINT WARRANTY ONE (1) YEAR
TERMS AND CONDITIONS

Rosenbauer hereby warrants the paint on the Rosenbauer aerial of each new fire & rescue vehicle to be free from blistering, peeling, corrosion or any other adhesion defect caused by defective manufacturing methods or paint material selection for a warranty period of one (1) year starting on the date the vehicle is delivered to original purchaser. Under this warranty, Rosenbauer agrees to furnish any item or items to replace those that have been found to be defective in material or workmanship where there is no indication of abuse, neglect or other than normal service. Such an item or items, at the option of Rosenbauer must be made available for our inspection at our request and returned to our factory or another location designated by Rosenbauer. Transportation of such an item or items will be arranged and covered by buyer within thirty (30) days after the date of failure and within one (1) year from the date of delivery of the apparatus to the original purchaser. The inspection must indicate that the failure was attributed to an adhesion defect caused by defective manufacturing methods or paint material selection. Authorization for repair or item replacement must be sought from Rosenbauer customer service department prior to repair or item replacement occurring.

This warranty is applicable only if the aerial device is serviced annually by an authorized Rosenbauer service facility. The cost of the annual service is the responsibility of the purchaser.

THIS WARRANTY SHALL NOT APPLY TO OR COVER THE FOLLOWING:

- Any item that has been repaired, repainted or altered by a facility not approved in advance by Rosenbauer.
- Special, incidental or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any defect resulting from misuse, negligence, alteration, accident or lack of normal or required maintenance or adjustments, exposure to corrosive agents, fire, severe environmental conditions or acts of God.
- Painted items which are manufactured by a party other than Rosenbauer and which are separately warranted by that party.

EXCLUSIONS OF DAMAGES BOTH INCIDENTAL AND CONSEQUENTIAL.

At no time shall Rosenbauer be held liable for any incidental, consequential, indirect, special and/or punitive damages whatsoever, whether coming from breach of contract, warranty, tort or equity. Such items shall include the chassis or other items sold by Rosenbauer, or their operation or their failure to operate, or defects herein, or any undertakings, acts or omissions related to, regardless whether Rosenbauer's knowledge of the possibility of any such damage.

Without limitation of the generality of the preceding statements, Rosenbauer categorically disclaims any and all liability for property and personal injury, damages, penalties for lost revenue and/or profit, loss of chassis or products and associated pieces of equipment, the expense of substituting chassis and/or products, or the out of service expenses, resulting from damages and/or delays, that creates down time expenses and/or create economic losses, or any third party claims for damages.

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

NOTE: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

CORROSION RESISTANT WARRANTY

A galvanized steel corrosion protection warranty shall be provided for the aerial ladder sections for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.

1. Aerial manufacturer will not be held responsible for any damage due to high temperatures from fire conditions, chemicals, or any material that could attack the galvanized surface.

2. The galvanized coating warranty shall cover re-coating of affected areas only.

3. Should any warranty claim occur, it shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

4. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

5. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the purchaser.

6. This warranty shall cover parts and labor to the affected area or parts only and shall not be deemed to include entire ladder sections or the entire aerial device. This warranty does not include aerial rung coverings.

7. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus..

8. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

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

EGRESS GALVANIZED & PAINTED

The fly section shall have a bolt-on egress section. The egress shall be galvanized and then painted the Yellow.

LADDER BED

A heavy duty ladder bed shall provide support of the aerial in the travel position.

On the base section of the aerial device, a stainless steel scuff plate shall be installed where the aerial comes in contact with the travel support.

GALVANIZED OUTRIGGERS

The aerial outriggers assemblies, beam, outer jack tube, inner jack tube, jack cover plate, and jack pad shall be galvanized.

The outriggers shall be galvanized inside and out. The process shall eliminate the rusting, scratching or paint chips on the outriggers. The galvanizing process shall permeate the metal and shall not be an "over-coating only" on outside surfaces. The galvanized components shall lessen the potential for corrosion and eliminates the requirement for finish paint. The process

shall negate any later requirement for touch-up paint or total repaint of the outrigger/stabilizer assemblies.

The galvanizing shall provide the steel outriggers with both barrier and cathodic protection from corrosion. The galvanizing process shall immerse the complete outrigger components in molten zinc. The galvanizing diffusion process shall allow the zinc to bond to the steel, at the molecular level. The galvanized zinc coating shall provide a barrier that shields the steel from the environment.

CORROSION RESISTANT WARRANTY

A galvanized steel corrosion protection warranty shall be provided for the aerial outriggers and stabilizers for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.

1. This warranty shall cover parts and labor to correct the affected area or parts only and shall not be deemed to include entire outrigger or stabilizer assemblies. This warranty does not include the turntable, aerial ladder sections, or torque box.

2. Should any warranty claim occur, the affected area shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

3. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

4. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the purchaser.

5. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus..

6. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

7. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to the outriggers and stabilizers shall be limited to the cost of bringing the affected area into compliance with the specifications or of removing any defects in materials or workmanship.

GALVANIZED TORQUE BOX

The torque box shall be hot dip galvanized inside and out. The galvanizing shall include the top and bottom and sides of the torque box, outrigger electrical compartment, and outrigger valve control compartment.

The torque box shall be totally hot dip galvanized. The galvanizing process shall not be an over-coating only to outside surfaces but shall permeate the metal. The galvanizing process shall prevent or greatly lessen rust and corrosion on the torque box and in areas between the torque box and chassis frame rails, as well as areas which cannot be reached when washing the unit and which cannot be visually inspected, and shall eliminate the need to finish paint the torque box.

The galvanizing process shall provide the steel torque box assembly with both barrier and cathodic protection from corrosion. The galvanizing process shall immerse the complete torque box component in molten zinc. The galvanizing diffusion process shall allow the zinc to bond to the steel, at the molecular level. The galvanized zinc coating shall provide a barrier that shields the steel from the environment.

CORROSION RESISTANT WARRANTY

A galvanized steel corrosion protection warranty shall be provided for the aerial torque box for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.

1. This warranty shall cover parts and labor to correct the affected area or parts only and shall not be deemed to include the entire torque box assembly. This warranty does not include the turntable, aerial ladder sections, or outrigger/stabilizers.

2. Should any warranty claim occur, it shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

3. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

4. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the purchaser.

5. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus..

6. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

7. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to the torque box shall be limited to the cost of bringing the affected area into compliance with the specifications or of removing any defects in materials or workmanship.

RUNG COVERS

For ease of climbing the ladder rungs shall be equally spaced on a maximum 14" centers and minimum 11.75" centers and shall have a skid-resistant surface or covering.

For added safety, skid-resistant rung covering shall be provided. The rung covering shall not twist and shall cover at least 60 percent of the climbing area of each rung.

Round rungs shall be provided and shall have a minimum outside diameter of 1-1/4", including the skid-resistant surface or covering.

For maximum strength, the minimum design load for each rung shall be 500lb distributed over a 3-1/2" wide area at the center of the length of the rung with the rung oriented in its weakest position.

Each aerial rung shall be covered with one (1) continuous piece of a protective, High-Traction safety walk non- skid material.

WEAR PADS

The aerial wear pads shall be "PET" type and shall incorporate semi-crystalline hardness, rigidity, mechanical strength with exceptional sliding properties and very low sliding wear. The pads shall be used between the telescoping sections for maximum weight distribution, strength, and smooth operation. Side wear pads shall be nylatron GSM, stainless steel adjustment screws shall be provided on the side wear pads to permit proper side clearance.

SIGN PANEL BRACKETS

The aerial manufacturer shall supply aerial sign brackets welded to the base section of the aerial. These brackets shall be located on both sides of the base section.

AERIAL SIGN PANELS

Sign panels shall be provided one on each side of the base section that are 16" high x 120". Sign Panels shall be primed with two (2) coats of PPG or equal lead free primer and then shall be sprayed with one (1) coat of color using PPG paint. The color of the sign panels shall match the color of the ladder sections.

CRADLE COVER BRACKETS

Brackets shall be installed on the cradle of the aerial for the installation of the cover. Design shall be done by the final OEM.

AERIAL LIFT CYLINDER PROTECTIVE COVERS

There shall be aluminum protective covers provided, one over each of the two (2) aerial lift cylinder assemblies. The covers shall be constructed from .125 thick, smooth aluminum material and be designed to prevent damage to the lift cylinders due to impact from environmental

factors. The protective covers shall be bolted in place using stainless steel fasteners and easily removable for service to the aerial lift cylinders. Lubrication points shall be accessible without the need to remove the protective covers. In addition to the added component protection, the lift cylinder covers shall provide added fire fighter safety from lift cylinder pinch point areas and superior aesthetic appearance to the aerial device.

PAINTED, MATCH LADDER SECTIONS

Cylinder covers shall be primed with two (2) coats of PPG or equal lead free primer and then shall be sprayed with one (1) coat of color using PPG paint. The color of the sign panels shall match the ladder sections.

EXTENSION MARKINGS

To improve safety and to provide the operator with vital information, extension markings shall be provided. For best visibility, the base section of the ladder shall include markings on the outside of the left handrail and the inside of the right handrail to indicate extension position of the ladder in operation. The markings shall be BLACK reflective numbers that will mark every 10 feet with a hash mark between the numbers.

ROOF LADDER BRACKETS BASE

There shall be welded plates and bolt on roof ladder mounting brackets installed on the outside of the base section.

ROOF LADDER

A Duo Safety Model 775-A, 14 foot aluminum roof ladder with folding steel roof hooks on one end and feet on the other end shall be provided on the outside of the base section. The ladder shall meet or exceed applicable NFPA standards. It shall be standard width 19" Duo-Safety roof ladder

FOLDING STEPS

The ladder shall be equipped with two (2) folding steps, one on each side of the ladder at the upper end of the fly section. These steps are spring loaded to hold in the stowed position. Once lowered, steps lock in the lowered position for use.

When steps are in the use position there shall be approximately a 7-1/2" diameter circular space for a hose to be placed on the rungs. The folding steps shall comply to applicable standards of NFPA #1901.

ROPE RESCUE EYELETS

Two (2) rope rescue eyelets shall be installed one on each side at the tip of the fly section, each anchor being rated at 250 pounds, for a total combined weight rating of 500 pounds.

AXE & PIKE POLE WELDMENTS

Welded-in mounting plates shall be installed for an axe mounting on the right side and a pike pole mounting on the left side of the fly section.

NO PIKE POLE PROVIDED

Pike pole will not be provided by aerial manufacturer.

AERIAL ROTATION SYSTEM

The rotation system shall be powered by a hydraulic motor to drive an eccentric planetary gearbox, capable of field adjustment, to rotate the aerial.

A 43.6" pitch diameter external tooth bearing shall be provided for 360 degree continuous rotation in either direction. As turntable bearing bolts are required to be checked and re-torqued at regular intervals, to make this task relatively simple, the ability to re-torque all bolts from the top of the turntable is mandatory.

The bearing shall be bolted to the bearing base plate using thirty (30) .625" SAE Grade 8 bolts and shall also be bolted to the turntable using twenty-nine (29) .625" SAE Grade 8 bolts.

A hydraulic release spring applied brake shall provide a positive lock for the rotation.

Two [2] pressure relief valves shall control the force of the rotation to protect the aerial from excessive side loads.

CONTROL PANEL LANGUAGE

All panels including main operations stations, outrigger stations, warning labels and load charts shall be written in English.

COMMAND PEDESTAL

The Aerial Command Pedestal is monitored by programmable logic control. The programmable logic control operating system shall use absolute encoders for elevation and rotation to be able to monitor the following functions continuously to offer maximum safety. The monitored aerial control functions are as follows:

The turntable shall have a stand up Aerial Command Pedestal. The following items shall appear on the panel at the main control station:

- One (1) aerial Smart Screen
- One (1) system pressure gauge, 0-5,000 psi minimum
- One (1) emergency stop button
- One (1) joystick controller
- Monitor switches

The system shall be capable of performing simultaneous aerial functions.

Smart Screen

One (1) aerial smart screen shall be installed at the main control station. The screen shall consist of multiple pages. All screen shall have the same information.

The first page on the screen shall be the main aerial information. It shall give the following information:

- Aerial rotation: as the aerial is rotated 180 degrees left and right of the ladder bed, positive and negative numbers shall indicate how far right or left the aerial is rotated.

- Aerial height: as the aerial extends and elevates the distance from of the top of the handrail to the ground shall be indicated on the screen.

- Aerial reach: as the aerial extends the reach shall be indicated on the screen from the tip of the aerial to the center of the turntable.

- Aerial extension remaining as the aerial extends the amount of feet remaining to extend shall be indicated.

- Rungs aligned indicator: as the aerial extends the rungs aligned indicator shall illuminate on the smart screen, indicating safety for climbing. The indicator shall not illuminate when the rungs are not aligned.

- Operational envelop indicators: prior to the aerial coming upon an unsafe operating position, while operating over the short, jacked side of the truck or too close to the cab and body, the collision protection shall ramp to a stop. The right disable, down disable and/or left disable indicators shall appear on the screen indicating to the operator the function that is inoperable based on the position of the aerial.

  The aerial shall be programed so it shall not make contact with the cab or body or any equipment as identified during the build process. Programmable cab and body collision protection shall alert the operator with indicators on the screen stating Right Rotation Disabled, Down Disabled and Left Rotation Disabled. Each individual indicator shall illuminate when the corresponding aerial function(s) (right rotation, left rotation or lowering) are disabled. All three indicators shall illuminate when the E-STOP is pushed or the outrigger interlock is active.

- Emergency stop engaged indicator: when the emergency stop button is engaged an indicator shall appear on the screen. An emergency stop button on the control panel shall be used for immediate emergency stopping of all aerial functions at all operating locations.

- Aerial load gauge: a load indicator shall appear on the screen to visually allow the operator to know they are within the safe operating parameters. The indicator shall change colors, green (safe), amber (caution) and red (overloaded) to alert the operator of the load on the aerial. The red load indicator shall flash and begin to sound a warning alarm at 100 pounds over the rated load.

- Outrigger short set indicator: when any outrigger is not fully extended and the jack is not supporting some of the truck weight a pie chart shall flash to indicate the outrigger has not been set for aerial operations. The outrigger diagram shall show the percent the outriggers have been extended. The outrigger diagram shall not change color until the jack has been set. Once the outrigger has been set the outrigger diagram shall change colors to match the pie charts display of color and safe operational envelop.

  The aerial shall be able to be rotate 360 degrees over the short, jacked side of the truck. A programmable logic control system allows the aerial to rotate over the short, jacked outriggers while maintaining safe operating parameters. An indicator shall appear on all the smart screens to warn the operator that one or more outriggers have been short set. An operational pie chart shall also be on the smart screen to indicate the safe operating parameters depending on the short set outrigger. In the event the vehicle has been set up with one or more of the outriggers short set, any attempted operation outside the predetermined parameters shall automatically ramp the operation to a feather-soft stop. A corresponding disable light shall appear on the screen to alert the operator of the disabled function. The operator shall be able to return the aerial back to the safe operating parameters without the use of overrides.

- Auto bedding indicator and switch: an indicator shall appear when the aerial is in the 20/20/20 zone (within 20 degrees left or right of the ladder bed, below 20 degrees elevation and 20 percent retraction remaining) indicating the ladder can now be automatically stowed. By pushing a momentary button on the side of the screen the aerial shall rotate, retract and lower into the bed while avoiding cab and body collision.

- Tip lights switch: a button on the side of the screen shall turn all of the tip lights and the rung lights on and off.

- Tracking lights switch: a button on the side of the screen shall turn all of the tracking lights, panel lights and rung lights on and off.

- Flow and Pressure gauge: an indicator on the screen shall give a continuous reading of the monitors flow and presser. Total gallons shall be saved until the truck master switch has been turned off.

- Hydraulic tank level: an icon will indicate the amount of oil left in the tank.

- Dirty filter: a picture will illuminate when the aerial filters are dirty and need to be replaced.

The second page shall display the following information:

- Side to side leveling: a picture and number (positive or negative) indicating how level the truck is left to right.
- Front to back leveling: a picture and number (positive or negative) indicating how level the truck is front to back.
- Aerial hour meter: continual reading of the operational hours on the aerial.
- Outrigger extension: an outrigger with percentage shall appear indicating how far the outrigger is extended: red (25%-49% extension), orange (50%-74% extension), yellow (75%-95% extension), or green (96%-100% extension). The percentage shall co-inside with the operational pie chart on the next page to show the operator the parameters in which the aerial shall be able to operate.
- Hydraulic tank temperature: an icon will indicate the temperature of the oil in the hydraulic tank.

The third page shall display the following engine diagnostics information:

- Engine RPM: shows live readings of the engines RPM's
- Engine coolant temperature shows live readings of the engines coolant temperature
- Engine oil pressure shows live readings of the engines oil pressure.
- Battery charging condition shows live readings of the engine's battery condition
- Transmission fluid temperature shows live readings of the transmission fluid temperature.
- Fuel level shows live readings in percentage of the amount of fuel remaining.

The fourth page shall display the following information:

- Aerial operations pie chart: an operational pie chart shall show in the corresponding color (red, orange, yellow or green) how far each outrigger out is extended and aerial's operational parameters based on each outrigger set up.

The fifth page shall display the following information:

- Load and reach chart: an aerial load and reach chart shall be displayed to inform the operator of the operational capabilities of the aerial wet and dry.

Aerial Speed

The aerials speed functions are proportionally regulated by the elevation and extension of the aerial. The aerial shall have proportional slow down on full extension and full retraction. The elevation system shall proportionally reduce the speed at sixty (60) degrees and ramp to off at full elevation. Lowering shall proportionally reduce the speed at three (3) degrees and ramp to off at minus twelve (-12) degrees. When the aerial is fully retracted the aerial speed shall be 20 percent faster than when fully extended.

The controls are also proportionally regulated during rotation, extension and elevation operations. The aerial shall smoothly ramp up to full operation speed to prevent jerking of the aerial. Should the operator release the controller during any of the three operations, the aerial shall ramp to a smooth soft stop.

Joystick Controller
A single joystick controller shall control aerial left/right, extend/retract and raise/lower functions. The joystick shall operate with the natural movement of the operator's hand for rotation and elevation. There shall be a thumb lever on the joystick to operate extension and retraction. The joystick shall have built in ramp up and ramp down capabilities.

The safety interlock trigger on the back side of the joystick must be engaged to operate all aerial functions. With the trigger activated the RPM's shall increase to 1,250 RPM and maintain there for two (2) seconds after returning to the neutral position.

Lighting
LED Lights shall illuminate the main control station and turntable work area for added operator visibility and safety.

GAUGES & VISUAL DISPLAY UNITS
All gauges and visual display on the aerial apparatuses at the operating positions shall readout in the following measurements:

- Distances shall be displayed in feet and inches
- Loads shall be displayed in pounds
- Flows shall be displayed in gallons/psi
- Engine information shall be displayed in F/PSI

CONTROL STAND LID
There shall be a lid installed on the command pedestal to give extra protection to the screen and joystick.

TURNTABLE
The turntable shall be two sided (left and rear) with the corners cut to allow for personnel to enter and exit the turntable. The turntable walking area shall be covered with NFPA #1901 compliant skid resistant black Line-X, with a 2-1/2" lip. Two (2) 42" high, slip resistant handrails capable of withstanding a 225 pound force applied from any direction shall be installed on the turntable.

HANDRAIL STEEL LINE-X
The handrails shall be steel and coated in black line-x.

HANDRAIL ORIENTATION
The turntable handrails shall be bent outwards to allow for maximum room. A lit crossmember shall be installed roughly halfway up the handrail. The handrail shall have an opening that allows for equipment to pass through from the ground to the aerial.

LIT CROSSMEMBER COLOR
The crossmember light color shall be red.

TURNTABLE MAN SAVER BARS
Two (2) Fire Research Man Saver bars shall be installed on the left and right side of the turntable. The safety bars shall lift either upward or inward to open, and be spring loaded to automatically return to the horizontal closed position. The safety bar assembly shall be made of aluminum and stainless steel.

MANSAVER BAR COLOR
The man saver bar vinyl cover shall be red.

TURNTABLE FINISH
The aerial control console will be constructed from smooth aluminum and Line-X black. The back of the control panel will have one (1) full hinged door. The front of the control panel will have one (1) 8" x 8" hinged door. These doors are provided for maintenance and emergency operation of the aerial.

TURNTABLE LID DOOR AJAR LIGHT
The cover of the turntable control console shall be designed to indicate when the lid is open. The light will be connected to the door ajar/outrigger extended light in the cab.

OUTRIGGER CONTROL PANEL
The outrigger control panel shall have a switch to energize the hydraulic system for outrigger functions.

Control Panel
The control panel shall include a Smart Screen that will display the same information as the other Smart Screens on the aerial, no buttons shall be active that will allow for aerial operation (i.e., auto bedding). There shall be three (3) switches not located on the screen at the rear of the truck.

- Manual override system to override the outrigger/aerial interlock system
- One (1) switch for the emergency power unit.
- Outrigger on/off switch

HYDRAULIC HIGH PRESSURE FILTER
The hydraulic system shall be equipped with a 'high pressure' hydraulic oil filter between the pump and the control valve designed to meet the flow requirements of the system. There shall be a filter replacement light on the outrigger control panel for the convenience of the mechanic. The return filter and pressure filter shall be connected together to the same light on the outrigger control panel to indicate replacement of filters.

HYDRAULIC RETURN FILTER
The return line filter element shall be connected to the hydraulic reservoir. The unit shall be a 10 micron return line replaceable filter element with indicator gauge.

WARNING LABELS
Danger, caution, and warning labels shall be installed at all aerial control stations, individual controls, and at various locations on the aerial device. These labels shall be in compliance to industry warning symbols, ASME, SAE, and applicable NFPA #1901 standard. These labels shall be with symbols commonly used in the fire industry.

AIR HORN
A momentary button shall be provided for controlling the vehicle's air horn within Rosenbauer Aerials smart screens.

TORQUE BOX
The torque box connecting the turntable to the outriggers shall provide the rigidity needed for the aerial to be operated at -10 degrees to +75 degrees elevation at full extension. The dimensions of the torque box will be unique to the truck and based upon customer requested specifications and engineering stability requirements. The back of the torque box shall be open for the option of ladder storage.

TOW EYES
Two (2) tow eye mounts shall be installed on the rear of the torque box.

OUTRIGGER COMPONENTS
The aerial device outriggers and stabilizers shall be designed to function with the Smart Aerial operational components. The system shall have a pad that pivots left-to-right and front-to-rear.

Extension Beams

The extension beams shall entirely enclose the extension cylinders to prevent damage to the rods and hoses. Each outrigger shall be controlled with an independent controller which can extend and lower the outrigger at the same time or raise and retract the outrigger at the same time.

A double box design shall enclose the jack cylinders completely to protect the rods from damage that could result from exterior circumstances.

Jack Cylinders
The jack cylinders shall have pilot operated check valves for both the raised and lowered positions. Each jack tube shall be drilled for mechanical pin locks for a safety backup.

The outrigger jack cylinders shall be mounted so they can be removed from the top of the outrigger jack tube. Jack cylinders that are removed from the bottom of the outrigger jack tube will not be accepted.

Outrigger Deployment Alarm and Warning System
The outrigger deployment alarm, of not less than 87 DBA, shall sound at all times while the outrigger master switch is in the on position and stops sounding only when the outrigger switch is

turned off. The audible alarm shall warn personnel that outrigger movement is possible at any time the switch is on.

Safety Features
The outrigger system provides the following safety features:

- A cradle interlock system shall be provided, to prevent the lifting of the aerial from the nested position until the operator has positions all the stabilizers in a load supporting configuration.

- There shall be a system on the truck that continually monitors the weight and balance on the truck and how that effects the associated operating parameter. This system allows operators to set up the truck up in a short-jacked position. The operator shall be allowed to operate the full 180 degrees off of the short-jacked side of the truck within the safe operating parameters without the need of a second operator. Operators shall be able to identify on the screen what quadrant each outrigger is set in as well as the associated safe operating parameters they are in.

- The outrigger not extended indicator on the screen shall have a warning indicator flashing if one or more outriggers has not been set.

- The monitoring system on the truck shall be able to identify if two or more adjacent outriggers come off the ground and shut down the current aerial operation. The monitoring system shall then only allow the operator to adjust the truck back into the safe operating parameters.

Lighting
A Whelen V-Series, model 5V3R, shall be mounted to the inside of the vertical outrigger jack beam. The warning light shall consist of 12 red Super-LED's installed on a V-light PC board with a TIR V-light reflector. The flashing lights shall alert personnel on either side of the outrigger of it is location. The V-light PC board shall have four white Super-LED's installed below that work independently as the ground illumination light. The lights shall activate with the master switch.

Outrigger and Stabilizer Specifications

The specified outriggers and torque box system shall provide a 1-1/2 to 1 stability safety factor when the aerial is in any operating position.

The stability requirements shall be met by the apparatus on which the aerial device is mounted when that apparatus is in a service-ready condition but with all normally removable items such as water, hose, ground ladders, and loose equipment removed.

The aerial device shall be capable of sustaining a static load 1-1/3 times its rated capacity in every position in which the aerial device can be placed when the apparatus is on a slope of 5 degrees downward in the direction most likely to cause overturning.

All outriggers and stabilizers that protrude beyond the body of the apparatus shall be striped or painted with reflective material so as to indicate a hazard or obstruction. Each outrigger or stabilizer shall also be provided with one or more red warning light(s) located either on the stabilizer or in the body panel visible on the side of the apparatus where the stabilizer is located.

Cradle Interlock System

A cradle interlock system shall be provided, to prevent the lifting of the aerial from the nested position until the operator has positions all the stabilizers in a load supporting configuration. A switch shall be installed at the cradle, to prevent operations of the stabilizers once the aerial has been elevated from the nexted position.

OUTRIGGERS

Two (2) out-and-down outriggers shall be installed behind the rear axle and shall be connected to the torque box.

The outrigger assembly shall consist of the following components

1. A 2" inside diameter cylinder with a 1.125" outside diameter rod shall extend and retract the outrigger 48".

2. A 5" inside diameter cylinder with a 3" outside diameter rod shall raise and lower each jack tube a distance of 22".

Outrigger Spread

The total width from the center of pivot pin to center of pivot pin when the outriggers are fully extended shall be: 15' 6".

OUTRIGGER PLATES

An auxiliary outrigger plate shall be provided for each outrigger. The units shall be 2' x 2' in size, one for each outrigger made from 1/2" aluminum with a handle for easy movement.

OUTRIGGER STOWED INDICATOR LIGHT

An outrigger stowed indicator light will be provided in the cab. The light shall indicate if one or more outriggers is not fully retracted and fully raised. The light will be connected to the door ajar light in the cab.

PERFORMANCE CAPABILITIES

The following are aerial ladder and water capabilities for the operation of this unit in the unsupported configuration with the truck level, the outriggers fully extended and lowered to relieve

the chassis weight from the axles. The capabilities are based upon 360-degree continuous rotation and up to full extension.

The following capabilities are based upon continuous 360-degree rotation and up to full extension. The aerial ladder and water system shall be designed to permit the following flows:

1,500 GPM: 0 degree -30-degrees to the side of the ladder centerline
1,250 GPM: 31 degrees to 45-degrees to the side of the ladder centerline
1,000 GPM: 46 degrees to 90-degrees to the side of the ladder centerline

1,500 GPM: 135-degrees down from a line parallel to the centerline

Elevation	**Capabilities DRY**		**Capabilities WET**	
	Tip Load	**Evenly Distributed**	**Tip Load**	**Evenly Distributed**
-10 degrees to 30 degrees	500 lbs	1,000 lbs	500 lbs	750 lbs
30 degrees to 45 degrees	500 lbs	1,500 lbs	500 lbs	750 lbs
45 degrees to 60 degrees	750 lbs	2,000 lbs	500 lbs	1,500 lbs
60 degrees to 75 degrees	1,000 lbs	2,500 lbs	500 lbs	2,000 lbs

The flow of the monitor shall adjust automatically through the onboard programming that controls the valve metering to allow for the desired flow rating. As the monitor is rotated right or left the flow will automatically be adjust based on the position of the monitor.

The smart flow shall be displayed on the smart screen by showing the following:

- Pressure: pressure at the base of the waterway going up the aerial.
- Flow: a continual reading of the flow going up the aerial waterway
- Total flow: the total amount of water flow through the waterway
- Monitor position: visual position of monitor on the screen (left/right and up/down) to help indicate the flow that will be allowed
- Valve position (open/close):icon indicating if the valve is fully open, partially open or closed based on the desired flow of the operator.
- Gallons allowed: gallons allowed depending on position of the monitor
- Valve open and close buttons: two active buttons on the screen one will open the valve to the desire the operator and depending upon the position of the monitor and the other will close the valve with the monitor at any position

An additional smart screen will be added to the pump panel location, smart screen will include the same information at the main control station (i.e., lights, envelop indicators, aerial load gauge, engine information, outrigger placement etc. . . .).

The ladder meets the 2:1 safety factor requirement for material based on the weight of the ladder plus a 500 pound live load at the tip of the aerial, flowing 1,500 GPM of water at 30 degrees to the side of the aerial at zero degrees elevation.

If a monitor is ordered that can elevate above 0 degrees the tip load shall be reduced to 250 lbs.

SWIVEL

There shall be a 4" waterway swivel with 360 degrees continuous rotation. It shall be installed through the turntable and torque box to connect the aerial waterway plumbing from the water pump to the aerial. The hydraulic oil for the aerial shall be directed through a two-port hydraulic swivel with 360 degrees continuous rotation.

The swivel will be a modular three component swivel. It shall have a separate electrical swivel, hydraulic swivel and waterway swivel that when connected shall form one component. The three individual swivels shall not affection the operations of any other part of the swivel. Individual replacement of each individual portion of the swivel shall be capable.

WATERWAY

An aerial waterway shall be provided from the base of the aerial device to the tip of the fly section. The aerial telescoping aluminum waterway shall be fabricated of aluminum and shall have three (3) tubes as follows:

1. 4-1/2" outside diameter at the base section
2. 4" outside diameter at the middle section
3. 3.5" outside diameter at the fly section.

WATERWAY COLOR

The waterway base tube color shall be left in its natural aluminum color. The inner telescopic tubes shall be left black.

ELECTRICALLY OPERATED BUTTERFLY VALVE

An Akron 4" electric butterfly valve, style 7940, shall be installed below the swivel. The valve shall be controlled through a screen at the pump panel in addition to all the Smart screens specified.

An electrically driven worm gear rotates a gear sector for smooth and easy operation with no switches inside the gear actuator to malfunction. The speed of the valve opening and closing is preset to comply with the current NFPA 1901 Standard. The valve will operate on a 12-volt apparatus electrical systems. It has a manual override with the gear driven ratio of 64:1.

RETRACTABLE WATERPAN

The monitor connected to a water pan and shall be retractable allowing the monitor to be secured at the tip of the fly section for water tower operations or at the end of the next lower section for rescue operations. When the aerial is fully retracted the monitor, lock shall be quickly movable and easily accessible at the tip of the aerial. To improve safety of the truck and on the fire scene the smart system shall be able to sense and indicate on the screen the position the water pan is in. Should the smart system lose the sensor an icon on the screen shall alert the operator and restrict operations until the water pan is securely latched.

The rescue mode feature shall allow the tip of the fly section to be placed very close to the edge of a building or window minimizing the working and access heights on and off the ladder tip without worrying about the monitor being damaged.

Monitor controls shall be located on the retractable waterway pan and on the aerial control console. The retractable waterway pan electrical cable shall be guided by e-chain for protection of the cable when repositioning the monitor from the fly section to the next lower section. No manual hand plugs, external reels, or coiled self-retracting cable shall be needed. All electrical connections shall be directly connected to the monitor.

WIRELESS RADIO REMOTE

There shall be a radio receiver for the aerial, monitor and outriggers controls supplied at the aerial control panel and powered by the chassis 12-volt electrical system The radio receiver shall have proportional outputs to drive the 12-volt electric proportional aerial and outrigger control hydraulic valves, as well as the on/off output for monitor control.

The radio remote control transmitter/receiver shall be powered by two AA batteries and shall operate approximately 300 feet from the truck; no tether shall be required. The transmitter / receiver shall have a belt strap for comfortable operations. The remote shall control following:

Aerial Controls	Monitor Controls	Outrigger Controls
Raise & Lower	Stream & Shape	Extend & Retract
Extend & Retract	Up & Down	Raise & Lower
Left & Right Rotation	Left & Right Rotation	

The following items shall be included on the remote:

Enable Switch: shall allow the remote to talk to the transmitter located at the main control station. Hitting the momentary enable switch shall allow the operator to begin operations of any function on the remote. If the operator does not choose a function after engaging the enable switch the remote will cease communication with the transmitter after 5 seconds. This switch serves as a dead man switch to the controls on the remote.

Full / Half Speed Switch: there shall be a turtle and rabbit indicator on the remote to allow the operator to run the aerial operations at full (rabbit) or half (turtle) speed.

Air Horn Switch: shall allow the operator to engage the air horn on the truck (if there is one).

Emergency Stop Button: if enabled, shall lock out all operations of all controls from every operator station. This serves as a safety back up in case the operator gets the aerial into an unsafe situation. The operator will have to disengage this switch before being able to operate the aerial from any control station.

Auto Bed Switch: is a momentary switch that when engaged will rotate, retract and lower the aerial into the bedded position while avoiding cab and body collision. Once the aerial is in the 20/20/20 zone (within 20 degrees left or right of the ladder bed, below 20 degrees elevation and 20 percent retraction remaining) the ladder can now be automatically stowed.

LCD Display: shall give the operator continuous readings of the aerial information. This information shall include:

- Aerial rotation: as the aerial is rotated 180 degrees left and right of the ladder bed, positive and negative numbers shall indicate how far right or left the aerial is rotated.
- Aerial height: as the aerial extends and elevates the distance from of the top of the handrail to the ground shall be indicated on the screen.
- Aerial reach: as the aerial extends the reach shall be indicated on the screen from the tip of the aerial to the center of the turntable.
- Aerial elevation: as the aerial is elevated the elevation angle is indicated.
- Aerial extension remaining as the aerial extends the amount of feet remaining to extend shall be indicated.
- Operational Envelop Disabled: shall be indicated on the screen if the left, right or down function is disabled.
- Overload Condition: shall display on the screen to alert the operator.
- Outrigger Not Set: is displayed if the outriggers still need to be set.
- Outrigger Not Extended: when any outrigger is not fully extended and the jack is not supporting some of the truck weight the operator shall be notified of the exact outrigger that needs to be adjusted.
- Breathing Air (optional): shall be reported if the breathing air is low or off.

PROPORTIONAL ELECTRIC OUTRIGGER CONTROLS

The aerial shall be equipped with two (2) out and down outriggers with proportional control the electric outrigger valves activated by momentary rocker switches. The proportionally controlled outriggers shall allow the outrigger to deploy at full speed up until the very end of positioning at which time the valve shall back off and allow the outrigger to come to a smooth soft stop. The main controls shall be located at the rear and to the outside of the truck, additional controls shall be provided on a wireless radio remote. Both locations shall give the operator full view and control of each outrigger.

ALL JACKS UP SWITCH

There shall be a switch on the smart screen to raise all of the outrigger jacks up at the same time. Once all aerial operations are complete, the safety pins are pulled; activate the all jacks up button to stow the outrigger jacks. All the jacks will raise up until they are in their stowed position. The operator shall then manually retract the outriggers to the stowed position.

MONITOR

One (1) Rosenbauer Aerials monitor model 3480 shall be supplied on the aerial. These firefighting monitors have a unique waterway design that provide balanced forces on the outlet and reduced friction for the stream resulting in exceptional performance over a wide range of flows in a compact configuration. The onboard, fully sealed IP 67 CAN control system features “plug and play” installation with built-in wireless capability and a USB port for quick software updates in the field. The 355 degree rotation and 165 degree elevation range can be configured for deck or aerial applications making this high performance compact monitor truly universal. The monitor shall be painted black in color.

Three (3) toggle switches shall be located at the turntable aerial control stand and at the tip of the aerial. The switches will control the raise/lower, stream/shape, and left/right functions of the monitor. The controls at the aerial control stand will override the controls at the tip of the aerial.

NOZZLE

A Rosenbauer Aerials model 5178 electrically controlled combination solid stream and fog nozzle shall be provided at the end of the monitor. The nozzle shall be constructed of Pyrolite, with a 2" orifice solid bore, and a fog flow of 1500 GPM at 80 PSI. The nozzle shall have a 12 volt electric motor, a 3.5" NH inlet, and built-in stream shaper, and shall not exceed 14-13/16" in length or 24 lbs, in weight.

PRECONNECT

One (1) 4" handwheel operated butterfly valve shall be installed between the end of the waterway and the monitor. The butterfly valve shall direct water flow from the waterway to the 2-1/2" pre-connect discharge. A 2-1/2" quarter turn ball valve shall be installed ahead of the 2-1/2" pre-connect discharge. The 2-1/2" pre-connect discharge shall have a NH male thread with a 2-1/2" female to 1-1/2" NH male thread and shall be mounted on the retractable waterway pan. One (1) 1-1/2" cap and chain shall be supplied with pre-connect.

2.5" RELIEF VALVE

A 2.5” relief valve shall be installed above the turntable.

RELIEF VALVE & DRAIN VALVE

A 2-1/2" preset relief valve shall be placed in the aerial waterway system and shall be capable of the dumping of water to the environment to protect the waterway system.

One (1) 1-1/2" quarter turn drain valve shall be installed at the low point of the waterway plumbing system.

INTERCOM

The two station intercom communication system shall have the master station at the turntable and secondary intercom and speaker at the tip of the aerial.

The master station shall have a volume control and a push-to-talk button. The remote station shall operate "hands free" and constantly transmit to the master station and speaker, unless the master station push-to-talk button is pressed.

The intercom shall be designed for exterior aerial application. Each station shall have a weather resistant and protective housing and water resistant speakers.

Atkinson Intercom

The Atkinson Dynamics Intercom AD26C master intercom and the AD26D slave intercom are designed for use in rugged, physical conditions and challenging acoustic environments. The durable construction is ideal for use on fire apparatus, emergency vehicles or any other mobile command equipment. The Atkinson Intercom provides high volume, clear audio communication.

The system is designed to provide clear communication for all personnel with minimum connections.

The remote unit, installed at the ladder tip, continuously transmits to the base stations. Base station units include a Push-to-Talk (PTT) button to transmit to other intercom positions.

LIGHT HOUSING COLOR

All light housing shall be white in color.

TRACKING LIGHT

A Whelen, model number, S44MW light bar shall be installed on the bottom of the cradle cross bar to serve as the tracking lights and illuminate the ladder sections. The lights shall be activated from the tracking light switch on the main control station.

TIP LIGHTS

Two (2) Whelen Micro Pioneer™ Model # MPPWCS shall be installed at the tip of the aerials. The 45 watt +12 DC, 3.25 Amp, Micro Pioneer light head configuration shall incorporate 12 white Super-LED® with a TIR reflector and a polycarbonate cover with a chrome finish. The MPPWCS lights shall be activated from the tip light switch on the main control station and have an On/Off switch covered by a rubber boot and a black fiberglass enforced polycarbonate handle. The MPPWCS shall have a standard 8° spot light lens. The MPPWCS light shall have 4,100 usable lumens.

Two (2) LED Whelen 3SC0CDCR, 12 volt lights shall be installed on ladder bed facing back toward the turntable. The steady burn illumination light shall incorporate six white Super-LED and a clear non-optic hard coated polycarbonate lens for maximum output. The hard coated sealed lens shall provide extended life/luster protection against UV and chemical stresses. The light shall be wet sealed and vacuum tested to ensure proper sealing. The conformal coated PC board, powder coated die cast housing, and exterior rubber gasket shall provide additional protection against environmental elements. The 3SC0CDCR shall provide 360 usable lumens. The solid state illumination light shall be vibration resistant. These lights shall be activated from the aerial master switch. The lights will draw 0.3 amps.

RUNG LIGHTING

The ladder rungs of each aerial section shall be equipped with 12-volt LED luma-bar lighting. The luma-bar shall run the full length of the climbing portion of each section. These lights shall be activated from the turntable tracking light switch. The ladder rung lights shall be "red" in color.

HYDRAULIC SYSTEM

The hydraulic system shall have a load sensing, variable gallonage, hydraulic piston pump with a 12-volt pressure reducing system. To reduce the normal time for aerial set up, the hydraulic pump shall be of the load sensing design. The hydraulic system shall have sufficient oil flow to provide the capability of performing multiple functions simultaneously without reducing operating speeds of the selected functions.

The hydraulic oil for the aerial shall be directed through a hydraulic swivel with 360 degrees continuous rotation. Enclosed in the hydraulic swivel shall be a minimum of twenty (20) electrical collector rings and a maximum of thirty-six (36) electrical collector rings with 360-degrees continuous rotation.

The hydraulic pump shall be large enough to provide oil to meet all of the requirements needed for aerial and outrigger operation standards.

A pressure reducing valve set at 500 PSI above the system pressure shall be connected to the hydraulic pump. This pressure reducing valve shall be a safety device for hydraulic pump failure. The hydraulic oil shall be directed through high pressure hydraulic hose and tubing.

The hydraulic system shall be designed to direct oil to the outriggers only while the ladder is in the bedded position. The oil can be directed to the aerial operation only when all of the outriggers are supporting sufficient load. This operation is made available through the use of electrical diverter valves with a manual override system for safety backup.

Hydraulic System Installation

The non-sealing moving parts of all hydraulic components, whose failure results in motion of the aerial device, shall have a minimum bursting strength of four times the maximum operating pressure to which the component is subjected.

Dynamic sealing parts of all hydraulic components, whose failure results in motion of the aerial device, shall not begin to extrude or otherwise fail at pressures at or below two times the maximum operating pressure to which the component is subjected.

Static sealing parts of all hydraulic components, whose failure results in motion of the aerial device, shall have a minimum bursting strength of four times the maximum operating pressure to which the component is subjected.

All hydraulic hose, tubing, and fittings shall have a minimum bursting strength of at least three times the maximum operating pressure to which the components are subjected. All hydraulic hoses shall have a stamped embedded on one end of the metal fitting to include the date, technicians creating the hose identification number, PSI of hose and the company the hose was made by. This shall assist a mechanic in determining the age of the hydraulic hose.

All other hydraulic components shall have a minimum bursting strength of at least two times the maximum operating pressure to which the components are subjected.

The hydraulic system shall be provided with an oil pressure gauge at the control station position.

Hydraulic Reservoir

The hydraulic system shall be supplied by a 30 gallon oil tank with a 100 mesh filter on the pump inlet side.

A means for checking and filling the hydraulic reservoir shall be readily accessible.

The fill location shall be conspicuously marked with a label that reads “Hydraulic Oil Only.”

Instructions for checking and filling the hydraulic reservoir shall be provided.

The hydraulic system components shall be capable of maintaining, under all operating conditions, oil cleanliness and temperature that comply with the component manufacturer's recommendations.

HYDRAULIC GATED DRAIN LINE

One (1) quarter turn shut-off valve shall be connected in the drain line of the hydraulic oil tank..

HYDRAULIC GATED DRAIN LINE
One (1) quarter turn shut-off valve shall be supplied between the suction line of the hydraulic oil tank and the inlet of the hydraulic pump.

HYDRAULIC OIL ISO 32
United MV Extreme Hydraulic Oil is a multi-grade hydraulic lubricant engineered for extreme temperature ranges. The low pour point of -58° F enables this fluid to flow quickly in extreme cold climates, avoiding pump cavitation that results in pump wear. The high viscosity index of this fluid addresses the extreme hot climates and operating temperatures, thinning out less at high temperatures than typical hydraulic fluids.

United MV Extreme Hydraulic Oil is formulated with rust inhibitors, oxidation inhibitors, anti-wear agents and anti-foam additives. This fluid is fortified with a friction modifier lubricity agent necessary in hydraulic systems operating wet clutches and/or wet brakes, commonly found in industrial cranes and other off-road equipment. United MV Extreme Hydraulic is has very good water separation so that contaminant water may be drained from the reservoir when the machine is at rest. In-plant filtration systems insure ISO clean-liness standards during blending and container filling, providing a clean product for your expensive hydraulic system.
Allison 3000EVS

PTO
An electrical start-stop "hot shift" PTO shall be mounted to the transmission. The PTO shall be connected to the hydraulic pump and shall supply power for all aerial and outrigger operations. Electrical safety wiring shall require that the vehicle be in neutral and the parking brake set before the PTO will operate. A "PTO Engaged" indicator light is installed in the cab of the apparatus.

EXTENSION SHAFT
Due to the design of the chassis an extension shaft shall be installed to connect the PTO to the hydraulic pump to avoid hitting the shackle.

HYDRAULIC PUMP
The hydraulic pump and reservoir shall be a separate system independent of other vehicle functions. The pump shall be load sense type that will react to demand of the aerial without imposing unnecessary horsepower demands on the engine.

The lift, extension and tilt cylinders shall include holding valves for maximum safety in the event of pressure loss or hydraulic line failure. Flow control shall be electric, remote controlled, proportional type installed to insure smooth operation of the aerial. All hydraulic valves shall be equipped with manual overrides for emergency operation and/or manual push button mechanical overrides in event of electrical failure.

The hydraulic pumping system shall be capable of providing full performance at any engine speed.

Right Rotation:
The hydraulic pump right rotation shall have a displacement of \100cc with an SAE "C' 2-bolt flange and the shaft size shall be 14 Tooth SAE C Spline Shaft. The pump shall rotate right /CW (clockwise).

ELEVATION SYSTEM
The hydraulic elevation system shall have two (2) 5" inside diameter cylinders that have 2-1/2" diameter rods and a 30" stroke. The elevation system shall elevate the aerial from -10 degrees to +75 degrees. The cylinders shall be equipped with spherical bushings to minimize cylinder rod wear. Each cylinder shall have lock valves connected directly to the barrel of the cylinder.

A pressure-reducing valve shall limit the force of the aerial when lowering and the system pressure limits the force when elevating the aerial.

All hydraulic cylinders utilized in the aerial elevation and extension system shall be commercially available and shall be of standard sizes and lengths rather than special sizes or of proprietary manufacture. This requirement is important since it assures quicker parts availability, shorter down time, and less costly replacement parts for cylinders.

EMERGENCY BACK UP PUMP
An emergency hydraulic system shall be provided for capability for limited ladder functions and to stow the ladder and outriggers in case of prime motor failure.

The emergency system shall be powered from the 12-volt electrical system from the apparatus battery system and shall not be load managed.

SIREN / SPEAKER / WARNING LT PACKAGE

ELECTRIC SIREN AND CONTROL

A Whelen model #295SLSA1 electronic siren shall be mounted in the cab. This unit shall feature an electronic air horn, wail, yelp, hi-lo and shall have a hard wired PA microphone.

SPEAKER

One (1) Federal Signal DynaMax 100-watt speaker, model #ES100C, shall be installed. The speaker shall feature a Neodymium driver and a high strength composite housing that is chemical resistant and maintains rigidity at high temperatures.

SPEAKER

One (1) stainless steel grille shall be installed on the speaker.

SPEAKER LOCATION

The siren speaker shall be installed on the apparatus bumper extension, as determined by the body manufacturer.

FEDERAL MECHANICAL SIREN

One (1) Federal Signal Q2B mechanical siren, model Q2B-01PSD, shall be pedestal mounted onto the front bumper. The "Q" siren shall feature a highly polished chrome body and grille. The siren's distinctive mechanical wail sound shall produce 123 db at 10'. The siren control switch(es) shall be installed in the cab.

SIREN CONTROL

A foot switch shall be provided on the driver's side of the cab floor to activate the Federal Signal Q2B siren.

SIREN CONTROL

A foot switch shall be provided on the officer's side of the cab floor to activate the Federal Signal Q2B siren.

LIGHTBAR

Two (2) Whelen Ultra Freedom IV 21.5" light bars shall be included with the apparatus cab. The light bars shall be a model F4NMINI and shall be mounted on the roof of the cab, towards the front, above the windshield.

Each light bar shall feature:

- Two (2) red Linear Super LED corner modules
- One (1) white 400 series Linear LED light front center
- One (1) red 400 series linear LED endcap light
- Clear hard coated lenses to provide extended life/luster protection against UV & chemical stresses
- Designed in accordance with NFPA Zone A requirements

LIGHTBAR ACTIVATION

The front upper light bar shall be activated through the LCS Display "MASTER WARNING" button and can be individually disabled with a separate button located on the LCS display. These controls will be available at all LCS displays installed on the vehicle. White lights in the light bar will be automatically disabled with application of the park brake.

UPPER WING FRONT WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab upper wing area. The dimensions of the lights shall be 4-5/16" x 6-3/4".
The driver side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

The officer side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

INBOARD WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab, in the inboard warning light position. The dimensions of the lights shall be 4-5/16" x 6-3/4".
The driver side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

The officer side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

INTERSECTION WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the chassis cab. The dimensions of the lights shall be 4-5/16" x 6-3/4".
The driver side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

The officer side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed under the rear of the vehicle with an output level of 107 db. The alarm shall be wired to the back-up light circuit and will automatically activate when the transmission is placed in reverse.

HAAS ALERT / HA-5

R2V (Responder-to-Vehicle) with HAAS ALERT R2R (Responder-to-Responder) Capability HAAS Alert Model Number “HA-5” shall be provided. The device shall: be constructed of high strength, impact resistant, RoHS compliant ASA Plastic; have IP65 ingress protection; include a cellular modem that connects to commercially available cellular networks to transmit and receive

data to/from the HAAS Alert Safety Cloud™ and include a cellular network data plan that shall; send vehicle GPS location, speed, course, acceleration, and emergency lights status (e.g., “on” or “off”) to the HAAS Alert Safety Cloud every two (2) seconds while the vehicle is moving with e-master activated; send changes in the emergency lights status to the HAAS Alert Safety Cloud; be connected to the E-Master or emergency lights master via a minimum of 22-gauge wire; be connected to the vehicle’s main battery via a minimum of 20-gauge wire so that it receives constant power; be connected to the vehicle’s ground via a minimum of 20-gauge wire; have a parasitic shut off that turns off the device when the vehicle’s battery voltage falls below 12V; be mounted inside the cab on the dashboard, within 10 feet of the officer’s seat and with a clear view of the sky. The device shall be up-gradable to other communication technologies such as, at minimum; 5G, 5.9 band, and FirstNet.

The device shall utilize the HAAS Alert Safety Cloud to send digital R2V (Responder-to-Vehicle) alerts to nearby civilian drivers via in-dash infotainment and IVI (In-vehicle Infotainment) units, Waze and other popular consumer navigation applications when the vehicle is en-route with emergency lights engaged; utilize the HAAS Alert Safety Cloud to send digital R2V alerts to nearby civilian drivers via in-dash infotainment and IVI (In-vehicle Infotainment) units, Waze and other popular consumer navigation applications when the vehicle is on-scene with emergency lights engaged; has the ability to utilize the HAAS Alert Safety Cloud to receive digital R2R (Responder-to-Responder) alerts when the vehicle is en-route with emergency lights engaged and other responding emergency vehicles are in close proximity; have a port that connects to a compatible peripheral device to communicate R2R alerts to vehicle passengers. The device shall be able to communicate across all manufacturer brands.

The device shall have a companion, password-protected, web-based dashboard that provides authorized users with a map-based visualization of real-time vehicle location, emergency response status (i.e., “responding,” “on-scene,” “ready,” “offline”) with the ability for expanded attribution, vehicle speed and course, vehicle time-to-scene information, and vehicle time-on-scene information.

Dimensions – Length, Width, Height (Inches): 5.4” x 2.7” x 1.3"
Input Voltage - Power: 12.5V to 15V
Input Voltage - Lights Indicator: 12V to 15V
Amperage: 120 mA peak draw
Operating Temperature Range: -40°C to 85°C
Weight (Ounces): 7 oz.
The HAAS system shall be provided with a 5-year subscription.
Selected camera system shall be displayed on the driver's LCS display. The same camera signals shall also be provided on the officer's LCS display, if equipped.

REAR FACING CAMERA

A rear facing black box style rearview camera shall be installed on the rear of the vehicle. The camera shall activate when the vehicle transmission is shifted into reverse with the image viewed on the driver's LCS display.

The rear facing camera shall feature automatic heating when the temperature is below 10 degrees Fahrenheit, and 150-degree lens. No Exception.

DRIVER & OFFICER CAMERAS

There shall be two (2) teardrop style rearview cameras; one (1) mounted to the officer side of the vehicle, and one (1) to the driver side of the vehicle. The side tear drop cameras shall be activated with the corresponding turn signal. The images shall be viewed on the driver's and officer's side LCS displays. The side camera housings shall be chrome.

BATTERY CHARGER

A Blue Sea model #7532, 40-amp fully automatic high output battery charger shall be wired to the 12-volt battery system. The charger unit shall be mounted in a clean dry area and will be accessible for service and/or maintenance. The charger shall have a manufacturer's 5-year warranty. No Exception.

CHARGER LOCATION

The battery charger shall be located behind the driver's seat.

EJECTION UNIT

A Blue Sea 7851 Auto Eject 20-amp 120-volt shore power assembly, cover, motor input wire, power cord, and plug shall be installed. The 12-volt motor shall eject the shore power cord away from vehicle path upon sensing engine start; after ejection, the weatherproof cover snaps into position over inlet. The unit shall sequence energizing of an Auto Eject, eliminating terminal arching when connecting and disconnecting power cord.

The unit shall have a waterproof back enclosure with watertight cable fittings, which protect mechanism from road contamination.

SHORELINE INLET

There shall be a 20-amp Sure Eject auto eject with a red cover supplied.

SHORELINE LOCATION

The shoreline shall be located on the driver's side of the cab behind the front door and above the wheel well.

Please Specify Location best fit above wheel
204 DS

INDICATOR

The battery charger indicator shall be located in the canopy window.

216 DS

UPPER REAR WARNING LIGHTS

One (1) pair of Whelen Super LED, rotating beacons, P/N L31H*F, shall be installed, one each side on the upper rear of the apparatus body. The unit shall have dimensions of 4" high x 7-9/16" deep.

The driver side warning light shall be a Whelen LED rotator, model L31HRF with a red lens.
The officer side warning light shall be a Whelen LED rotator, model L31HRF with a red lens.

REAR WARNING LIGHT MOUNTING

The upper rear lights shall be mounted on cast aluminum stanchions attached to the apparatus body, one on each side.

Lower Cab Warning Provided on Chassis
Front Intersection Lights Provided on Chassis

LOWER MID-BODY WARNING LIGHTS

One (1) pair of Whelen model LINZ6 LED warning lights shall be installed, one each side one of the apparatus, mid body. The warning light shall incorporate six Super-LEDs, a clear non-optic hard coated polycarbonate lens, clear optic collimator and utilize a metalized reflector for maximum output. The dimensions of the lights shall be 2" x 4".

The driver side warning light shall be a Whelen Model LINZ6R red LED with clear lens.
The officer side warning light shall be a Whelen Model LINZ6R red LED with clear lens.

LOWER REAR SIDE WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side of the apparatus body, towards the rear of the body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Mounted on outrigger panel

The driver side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

The officer side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

LOWER REAR WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side on the lower rear of the apparatus body. The dimensions of the lights shall be 4-5/16" x 6-3/4".
The driver side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

The officer side warning light shall be a Whelen Model M6R red Super-LED^{TM} with color lens.

12-VOLT ELECTRICAL SYSTEM

LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS VMUX

A Weldon V-MUX® style 6060 Input/output "Hercules HC" Nodes shall be provided for the multiplexed electrical system; with a sealed to IP67 enclosure, sealed Deutsch connectors, (16) switch inputs, (4) analog sensor inputs, (32) output channels, dual A & B V-MUX communication ports, dual CAN communication ports, and built in LED network status indicators. The Hercules node shall be capable of carrying up to 120 amps of load at high temperatures (85C), be field programmable via USB, and support on-board diagnostics. (Item #6060-0000-00)

Weldon V-MUX style 6000 Input/output **"Hercules"** Nodes shall be provided for the multiplexed electrical system; with a durable extruded aluminum enclosure, sealed Deutsch connectors, (16) switch inputs, (3) analog sensor inputs, (26) output channels, dual A & B communication ports, and built in LED status indicators. The Hercules node shall be capable of carrying up to 120 amps of load at high temperatures, be field programmable, and support complete on-board diagnostics. (Item #6000-0000-04)

Weldon V-MUX style 6010 Input/output **"Mini"** Nodes shall be provided for the multiplexed electrical system, with a durable Deutsch enclosure, sealed Deutsch connectors, (4) switch inputs, (1) analog sensor input, (12) output channels, dual A & B communication ports, and built in LED status indicators. The Mini node shall be capable of carrying up to 55 amps of load at high temperatures, be field programmable, and support complete on-board diagnostics. (Item #6010-0000-00)

Weldon V-MUX style 6020 **"Input expansion"** Nodes shall be provided for the multiplexed electrical system, with a durable Deutsch enclosure, sealed Deutsch connectors, (16) switch inputs, dual A & B communication ports, and built in LED status indicators. The Input expansion Node shall be field programmable. (Item #6020-0000-00)

Weldon V-MUX style 6030 **"8x16"** Nodes shall be provided for the multiplexed electrical system; with a durable extruded aluminum enclosure, sealed Deutsch connectors, (8) switch inputs, (2) analog sensor inputs, (16) output channels, dual A & B communication ports, and built in LED indicators. The 8x16 Node shall be capable of carrying up to 80 Amps of load at high temperatures, be field programmable, and support complete on-board diagnostics. (Item #6030-0000-00)

Weldon V-MUX style 6241 **"Vista IV"** Nodes shall be provided as color display interfaces for the multiplexed electrical system; to indicate real-time status of doors, seats, sensors, and other components of the vehicle. The menu-oriented displays shall allow the user to control interior and exterior vehicle lights, interior HVAC, system Diagnostics, engine High Idle, among other multiplexed functions. The Vista IV shall support vehicle cameras, GPS display, and DVD video, through use of four NTSC-format video plug-in channels. The Vista IV display shall have the ability to automatically change screens based on vehicle state so as to show warning message or status. Messages will be displayed in a variety of text fonts and color graphics. Device controls will be accessed by means of seven fixed buttons using a custom label and eight screen-based menu-driven buttons. The Vista IV will support both flush surface mounting or 6" and 9" Pana Vise™ riser-mount options. The Vista IV can be updated (flashed) via a USB port, not requiring a PC/laptop interface. There is also a touch screen option with the Vista IV Standard. (Item #624x-xxxx-xx: exact part number will be based on configuration.)

Weldon V-MUX style **"Touchscreen Vista"** Nodes shall be provided as touchable interactive color display interfaces for the multiplexed electrical system; to indicate real-time status of doors, seats, sensors, and other components of the vehicle. The menu-oriented touch interface shall allow the user to control interior and exterior vehicle lights, interior HVAC, system Diagnostics, engine High Idle, among other multiplexed functions. The Touchscreen Vista shall support vehicle cameras, GPS navigation, and DVD video, through use of four NTSC-format video channels. The Vista touch only is protected by an ABS housing. The housing is slightly less than doubled in size to fit in most OEM radio openings. The Vista IV touch only has mounting options with aftermarket radio installation kits for a clean factory look. The Touchscreen Vista display shall have the ability to automatically change screens based on vehicle state so as to show warning message or status. Messages will be displayed in a variety of

text fonts and color graphics. Device controls will be nominally screen based, with an integrated interface with style 6311 PODS Button Modules. USB port is integrated for updating/programming display and will remain powered for USB charging abilities. (Item #624x-xxxx-xx: exact part number will be based on configuration.)

A Weldon V-MUX style 6310 **"PODS"** Controller with 6311 Button Modules shall be provided so as to support up to 64 programmable buttons which communicate along an expandable daisy-chaining serial link. The PODS Controller and Button Modules shall have built-in LED status indicators and be field programmable. (Item #6310-0000-24 (PODS Controller), #6311-0400-00 (4-button module), #6311-0300-00 (3-button module)

PUMP ENCLOSURE LIGHTS

One (1) LED work light shall be provided in the pump enclosure.
The control switch shall be mounted on the light head.

MARKER LIGHTS

LED marker lights shall be installed on the vehicle in conformance to the Department of Transportation requirements.

MARKER LIGHTS

Two (2) Britax P/N L427.203.L12V flex rubber arm style LED Clearance lights shall be mounted on the rear of the body, one each side. These lights are in addition to the lights required by the DOT.

LICENSE PLATE BRACKET

A stainless steel license plate bracket shall be provided at the rear of the apparatus. The bracket shall have a LED light.

TAIL LIGHTS

One (1) pair of Whelen M62BTT LED tail/brake lights shall be provided. The rectangular 4"x6" lights shall be red.

TURN SIGNALS

One (1) pair of Whelen M62T LED turn signals with populated sequential chevron arrow shall be provided.

BACKUP LIGHTS

One (1) pair of Whelen Series M62BU LED backup lights shall be installed on the rear of the apparatus body. The dimensions shall be 4" x 6" and the lens color shall be clear.

FOUR LIGHT HOUSING

One (1) pair of chrome plated tail light housings shall be supplied. Each housing shall be designed to hold four (4) Whelen M6 rear lights located at the lower rear corners of the body.

MID BODY LED TURN SIGNALS

One (1) pair of TechNiq S17 amber mid body LED marker / turn signals shall be provided. The location of the turn lights shall be at mid-body near the rear wheel axle.

GROUND LIGHTS

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail of the pump house.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

The ground lighting shall be activated when the parking brake is set.

GROUND LIGHTS

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rear step.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

The ground lighting shall be activated when the parking brake is set.
The ground lights shall automatically activate when the parking brake is applied.

REAR TAILBOARD LIGHTS

Two (2) LED step lights with clear lens shall be installed to illuminate the step surfaces at the rear of the apparatus body.

The step/walkway light switch shall be installed and wired to the parking brake.

LEFT SIDE BODY SCENE LIGHTING

The following scene lighting shall be located on the left side of the body:

SCENE LIGHT

Two (2) Whelen M9 Series Model # M9LZC scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M9LZC shall be furnished with a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.
Voltage: +12v
Size: H=6.51", W=10.34", D=1.892"
Amp Draw: 6.0 Amps
Lens Color: Clear

The scene light shall be installed on an aluminum mounting plate, painted to match the body.

SCENE LIGHT SWITCHING

The one (1) left side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "LEFT SCENE".

RIGHT SIDE BODY SCENE LIGHTING

The following scene lighting shall be located on the right side of the body:

SCENE LIGHT

Two (2) Whelen M9 Series Model # M9LZC scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M9LZC shall be furnished with a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.
Voltage: +12v
Size: H=6.51", W=10.34", D=1.892"
Amp Draw: 6.0 Amps
Lens Color: Clear

SCENE LIGHT SWITCHING

The one (1) right side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "RIGHT SCENE".

REAR BODY SCENE LIGHTING

The following scene lighting shall be located on the rear of the body:

SCENE LIGHT

Two (2) Whelen M9 Series Model # M9LZC scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M9LZC shall be furnished with a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.
Voltage: +12v
Size: H=6.51”, W=10.34”, D=1.892”
Amp Draw: 6.0 Amps
Lens Color: Clear

SCENE LIGHT SWITCHING

The one (1) rear scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screen and by a switch on the pump panel. The switching shall be wired to operate in a three-way configuration to allow the light(s) to be controlled from either location regardless of switch position. The switches shall be labeled "REAR SCENE".

SCENE LIGHT SWITCHING

The rear scene lights shall activate automatically upon placing the transmission into reverse.

CHASSIS MODIFICATION

FLUID DATA PLAQUE

A fluid data plaque containing required information shall be provided based on the applicable components for this apparatus, compliant with NFPA Standards:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Drive axle lubricant
- Power steering fluid
- Pump transmission lubrication fluid
- Other NFPA applicable fluid levels or data as required

Location shall be in the driver's compartment or on driver's door.

HEIGHT LENGTH & WEIGHT WARNING LABEL

A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area.

NO RIDE LABEL

A "NO RIDERS" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited.

CAB SEATING POSITION LIMITS

A label shall be installed in the cab to indicate seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

HELMET WARNING TAG

A label shall be installed in the cab, visible from each seating position. The label shall read "CAUTION: DO NOT WEAR HELMET WHILE SEATED." Helmets must be properly stowed while the vehicle is in motion according to the current edition of NFPA 1901.

REAR TOWING PROVISIONS

There shall be two (2) tow eyes furnished at the rear of the body and attached directly to each chassis frame rail. The tow eyes shall be accessible above the rear tailboard. The tow eyes shall be constructed of 5/8" plate steel with a 4" I.D. hole, large enough for passing through a tow chain end hook.

The tow plates shall be painted black.

TIRE PRESSURE INDICATOR

There shall be a tire pressure indicator, p/n RWTG1235, at each tire's valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

EXHAUST HEAT SHIELD

A heat shield shall be installed under the body in the areas where the exhaust system is routed.

REAR MUD FLAPS

A pair of black mud flaps shall be installed behind the rear wheels.

WATEROUS CXVC22 SINGLE STAGE PUMP

WATEROUS CXVC22 SINGLE STAGE PUMP

A Waterous model CXVC22, single stage centrifugal pump shall be designed to mount on the chassis frame rails and shall be split-drive shaft driven. The pump casing shall be of high-tensile, close-grained ductile iron. Pump body shall be a single piece housing, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing the mounting or piping.

IMPELLER

A matched bronze impeller specifically designed for the fire service will be provided. It will be accurately balanced both mechanically and hydraulically, for vibration-free operation. Stainless steel heat-treated and precisely ground to size. It shall be supported on both ends by oil or grease lubricated ball bearings.

Replaceable wear rings, bronze, reverse-flow, labyrinth-type shall be provided. Deep groove ball bearings shall be located outside the pump to give rugged support and proper alignment to the impeller shaft. The bearings shall be oil or grease lubricated. All bearings shall be completely separated from the water being pumped.

PUMP TRANSMISSION

The housing shall be constructed of high tensile aluminum and be of three (3) piece, horizontally split design. The transmission driveline shafts shall be made from alloy steel forging, hardened and ground to size. The drive and driven sprockets shall be made of steel, shall be carbonized, and hardened.

The drive chain shall be Morse HV involute form chain. The lubrication system shall be an impeller shaft driven oil pump to deliver oil to an integral spray header, to completely pressure lubricate the drive chain.

PUMP MOUNTING

The pump shall be bolted to steel angles in pump module, using grade 8 bolts.

DRIVELINE

Hollow-tube drivelines and universals shall be properly matched to the engine and transmission output torque ratings.

All Pump Manufactures recommend that their Pumps are drained after every use and be stored dry. End user is responsible to follow this recommendation.

1500 GPM FIRE PUMP SPECIFICATIONS

The centrifugal type fire pump shall be a Waterous model CXC22 midship mounted with a rated capacity of 1500 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

1500 GPM @ 150 PSI
1500 GPM @ 165 PSI
1050 GPM @ 200 PSI
750 GPM @ 250 PSI

All Pump Manufactures recommend that their Pumps are drained after every use and be stored dry. End user is responsible to follow this recommendation.

LEFT SIDE -- 6" UNGATED INTAKE

One (1) 6" ungated suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NST. The intake shall be provided with a removable screen.

A 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

RIGHT SIDE -- 6" UNGATED INTAKE

One (1) 6" ungated suction intake shall be installed on the right side pump panel to supply the fire pump from an external water supply. The intake shall be provided with a removable screen.

A 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

FIRE PUMP MECHANICAL SHAFT SEAL

The Waterous fire pump shall be equipped with self-adjusting, maintenance free, 'mechanical shaft seal' which is designed to be functional in the unlikely event of a seal failure.

IMPELLER HUBS

The Waterous fire pump impeller hubs shall be "Flame Plated", impregnated with tungsten carbide to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped.

ELECTRIC/PNEUMATIC PUMP SHIFT

The fire pump shift shall be air-operated incorporating an air cylinder with an electrically actuated pneumatic switch to shift from ROAD to PUMP and back. The fire pump shift control switch and valve shall be mounted in the cab.

The fire pump shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position. The system shall include a nameplate indicating the chassis transmission shift selector position to be used for pumping and located so that it can be easily read from the driver's position.

The system shall include the applicable NFPA standard interlocks, pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump shift system shall be equipped with an interlock system to ensure that the pump drive system components are properly engaged in the pumping mode of operation so the pumping system can be safely operated from the pump operator's position.

If applicable, the secondary braking device shall be automatically disengaged for pumping operations.

TRIDENT PRIMER – AUTOMATIC

An automatic fire pump priming system shall be provided and installed. The system shall be oil-less type and environmentally safe. Once engaged, the system shall be fully automatic and not require any action from the pump operator/engineer when pump draft is lost. This feature provides an additional safety margin by maintaining pump flow from the available water source automatically during drafting operations. When air is introduced during a drafting operation from conditions such as whirlpools or turbulence from porta-tank refill operations, the priming system shall automatically engage to remove the air and stabilize water flow and pump pressure. For additional safety, the entire system shall operate at less than 70dBA of ambient noise.

The priming system shall engage automatically whenever the pump discharge falls below five (5) psi and shall remain engaged until a pump prime has been achieved. The priming system shall automatically disengage when a positive pump discharge pressure has been established. The electrical current draw from the chassis batteries shall not exceed four (4) amps at any given time of operation and allow for unlimited run time without causing an overheat condition for of any of the system components.

A single engagement switch shall be provided on the pump control panel that will allow the operator to engage the automatic pump priming system. There shall be a light provided on the pump control panel to indicate when the system is engaged. The pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry, through 20 feet of suction hose of appropriate size. The priming system shall comply with applicable sections of NFPA standards.

PRIMER CONTROL

A rocker switch control shall be provided on the pump operator's panel, for the main pump primer control.

PRESSURE GOVERNOR AND ENGINE-PUMP MONITORING

A Fire Research InControl series TGA300 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pressure / RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons located on the front of the control panel. There shall be an USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine.

PUMP ANODES

There shall be sacrificial, zinc anodes in the pump steamer ports which shall protect the pump and piping from electrolysis. These anodes shall also act as screens.

STAINLESS STEEL PLUMBING

PUMP PLUMBING SYSTEM

The fire pump plumbing system shall be of rigid stainless steel pipe or flexible piping with stainless steel fittings. Mechanical grooved couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or mechanical grooved coupling connections.

The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards. The test results shall be included in the delivery documentation.

FIRE PUMP MASTER DRAIN

The fire pump plumbing system and fire pump shall be piped to a single push-pull type master pump drain assembly.

ADDITIONAL LOW POINT DRAINS

The plumbing system shall be equipped with additional low point manually operated drain valves to allow total draining of the fire pump plumbing system. These valves shall be accessible from the side of the vehicle and labeled.

STAINLESS STEEL INTAKE MANIFOLD

The suction manifold assembly shall be fabricated with Schedule #10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The suction manifold assembly shall have radiused sweep elbows to minimize water turbulence into the suction volute. The suction manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The stainless steel manifold assembly shall have a ten (10) year warranty.

STAINLESS STEEL DISCHARGE MANIFOLD

The discharge manifold assembly shall be fabricated with minimum of Schedule #10 Type 304 stainless steel. All threaded fittings shall be a minimum of Schedule #40 stainless steel. The discharge manifold assembly shall have radiused sweep elbows to minimize water turbulence. The manifold shall be welded and pressure tested prior to installation. The stainless steel manifold inlet shall be attached to the pump discharge and have additional brackets as required to support the discharge manifold, valves and related components.

The stainless steel manifold assembly shall have a ten (10) year warranty.

PLUMBING SYSTEM

The plumbing system shall be unpainted.

HOSE THREADS

The hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intakes and discharges.

WATER TANK TO PUMP LINE

A 3" water tank to the rear mounted fire pump line shall be provided with a full flow quarter turn ball valve, 4" piping, and with flex hose and stainless steel hose clamps. The tank to pump line shall be equipped with a check valve to prevent pressurization of the water tank.

The line shall be flow tested during the fire pump testing and shall meet applicable requirements of NFPA standards.

The tank to pump valve shall be controlled at the pump operator's panel.
The valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.
An Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.

FIRE PUMP TO WATER TANK FILL LINE

A 2" fire pump to water tank refill and pump bypass cooler line shall be provided. The valve shall be a full flow quarter turn ball valve with 2" piping and flex hose to tank. The valve control handle shall have a nameplate located near the valve control.

The valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.
An Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.

FIRE PUMP SPLIT SHAFT DRIVESHAFTS AND INSTALLATION

The mid-ship split shaft fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. The drive shaft(s) shall be spin balanced prior to final installation.

INTAKE RELIEF/DUMP VALVE

A TFT A18 series, 2-1/2" intake relief/dump valve preset at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi

to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive pressure is no longer present.

Discharge side of the intake relief valve shall be plumbed away from the pump operator.

FIRE PUMP COOLING

The fire pump shall be equipped with 3/8" cooling line from the pump to the water tank. This re-circulation line shall be controlled by a pump panel control valve with nameplate label noting it as the "fire pump bypass cooler". There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

CHASSIS ENGINE HEAT EXCHANGER COOLING SYSTEM

The apparatus shall be equipped with a heat exchanger for supplementary chassis engine cooling during fire pump operations. A manually opened valve, mounted at the operator's panel, shall direct water from the fire pump to the heat exchanger that is mounted in the engine radiator cooling hose. The system shall provide cooling water from the fire pump to circulate around the engine radiator coolant without mixing or coming in direct contact with the engine coolant. The complete installation shall be done by the fire apparatus manufacturer.

A nameplate label shall be installed on the pump panel noting "engine cooling system" with "on-off" opening directions noted.

UNDERWRITERS LABORATORIES CERTIFICATION

The pump shall undergo an Underwriters Laboratories Incorporated test per applicable sections of NFPA standards, prior to delivery of the completed apparatus.

The UL acceptance certificate shall be furnished with the apparatus on delivery.

FIRE PUMP TEST LABEL

A fire pump performance and rating label shall be installed on the fire apparatus pump panel. The label shall denote levels of pump performance and testing completed at factory. These shall include GPM at net pump pressure, RPM at such level, and other pertinent data as required by applicable NFPA standards. In addition, the pressure control device, tank to pump flow tests, and other required testing shall be completed.

In addition, the entire pump, suction and discharge passages shall be hydrostatically tested to a pressure as required by applicable NFPA standards. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by applicable NFPA standards. Pump shall be free from objectionable pulsation and vibration.

If applicable, the fire pump shall be tested and rated as follows:

- 100% of rated capacity at 150 pounds net pressure.
- 70% of rated capacity at 200 pounds net pressure.
- 50% of rated capacity at 250 pounds net pressure.
- 100% or rated capacity at 165 pounds net pressure.

LEFT SIDE -- 2-1/2" GATED INTAKE

One (1) 2-1/2" gated suction intake shall be installed on left side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a ¾" drain and bleeder valve. A nameplate label and removable screen shall be installed.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

A 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain or cable securement.

The valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

The valve shall be equipped with a manually operated, swing-type manual control located adjacent the intake. The valve shall be equipped with a color-coded name plate.

DISCHARGES

2" DISCHARGE FRONT CENTER BUMPER

A 2" discharge shall be installed at front center bumper area with brass swivel outlet with 1-1/2" NST male threads. The valve control shall be on pump panel and a nameplate label provided at valve control area.

The plumbing shall be flexible hose with abrasion resistant support mountings. Auxiliary low point drains shall be provided on the discharge line.
A Class 1 automatic type 3/4" bleeder valve shall be installed.

The hose connection for the front discharge shall be a swivel type located above the front bumper deck level.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball. For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

TWO (2) 1-1/2" CROSSLAY DISCHARGES

Two (2) pre-connect 1-3/4" hose cross lays shall be installed over pump enclosure, with quarter turn 2" diameter ball valves. The outlets shall be a 2" NPT female swivel x 1-1/2" male NST hose threads.

The cross lay hose beds shall have smooth aluminum sides. The hosebed decking shall be constructed with slots integrated into the hosebed floor. Dividers shall be installed to separate the cross lay beds.

Each hose bed shall provide for a minimum capacity of 200 feet of 1-3/4" diameter double jacket hose with the hose and nozzle provided by the fire department.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball. For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

CROSSLAY HINGED COVER WITH END FLAPS

The cross lay hosebed shall be equipped with a single aluminum diamond plate hinged cover with vinyl end flaps with hook & loop fasteners. The cover shall have rubber bumpers, latching devices, and lift up handle on each end of the cover.

The hosebed cover shall be labeled, "Not a Standing or Walking Surface", per NFPA.
The vinyl cover shall be red in color.

CROSSLAY HOSE BED TRIM

The cross lay hosebed shall be equipped anodized aluminum angle overlays, one on each end of the hosebed.

CROSSLAY HOSEBEDS

Crossley hosebed(s) shall be mounted over the upper pump panel or gauge panel in the upper portion of the pump enclosure. The cross lay hosebed shall be approximately 12" from the top of the pump enclosure.

LEFT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

Two (2) 2-1/2" discharge shall be installed on the left side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

Two (2) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

Two (2) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

One (1) 2-1/2" discharge shall be installed on the right side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 3" x 4" DISCHARGE

One (1) 3" discharge shall be installed on the right side pump panel area and shall be controlled by a full flow 3" slow-close quarter turn ball valve. The discharge shall have 4" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.
An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) lightweight aluminum elbow with 30 degree slant shall be provided. Threads shall be 5" Storz with lugs and manual locks x 4" female swivel NST with rocker lugs.

One (1) 5" lightweight aluminum Storz cap with cable or chain securement shall be provided.
The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.
One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature and a manual slow-close device shall be provided on the specified discharge. The handle shall be equipped with color-coded name plate.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

REAR AERIAL INLET AND DISCHARGE

One (1) 3" fire pump discharge shall be piped to the rear of the apparatus with 4" pipe and controlled with a slow close valve on the pump panel. The 4" rear inlet connection shall provide a dual supply to the aerial device. The rear inlet shall have 4" NST male threads and a 4" NST rocker lug cap with cable or chain securement shall be provided.

There shall be a 1-1/2" drain installed in the rear aerial supply line with control on the rear of the apparatus body.

A color coded nameplate labels shall be provided at rear and on the pump panel control handle.
An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced Teflon seals, and blow-out

proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close.

One (1) 4" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball. One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature and a manual slow-close device shall be provided on the specified discharge. The handle shall be equipped with color-coded name plate.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RELIEF VALVE

A pre-set relief valve capable of protecting the waterway system by relieving pressure through the dumping of water to the environment. The relief valve shall be plumbed to dump the excess water below the chassis frame rails.

DRAIN VALVE

A 1-1/2 inch minimum drain valve shall be installed at the low point of the waterway inlet system. The handle to operate the drain valve shall be extended to the rear of the body.

PUMP PANEL- SIDE MOUNT

SIDE MOUNT PUMP ENCLOSURE

The side mount pump enclosure shall be removable and supported from the chassis frame rails. This enclosure will allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle.

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of NFPA standards.

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel,

allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted in line with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

The following controls and equipment as specified in the specifications, shall be provided on the pump panel or within the pump enclosure:

- Primer.
- Pump and plumbing area service lights.
- Pressure control device and throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel lights.

CROSSLAY INSTALLATION

The dunnage area atop the pump enclosure shall be notched for the installation of a cross lay hose bed. The hosebed shall have smooth sides and a perforated floor to allow for drainage. Provisions shall be provided to secure hose and equipment per requirements of applicable NFPA standards.

OPEN DUNNAGE COMPARTMENT -- OVER PUMP ENCLOSURE

An open compartment shall be located on the top of the pump module. The compartment will be constructed as large as space permits with removable slip resistance floor material or decking in the base of the compartment.

LEFT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The left side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance with applicable sections of NFPA requirements.

RIGHT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The right side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance with applicable sections of NFPA requirements.

PUMP SLIDE OUT STEP -- LEFT SIDE

A slide out step assembly shall be installed on the left side pump panel using roller bearing slide tracks. The step shall be fabricated of slip resistant NFPA compliant grating, and shall extend out approximately 14" and lock in both the in and out positions.

PUMP ENCLOSURE ACCESS DOOR -- LEFT SIDE UPPER

A pump panel access door shall be provided on the upper left side of the side mount pump enclosure. The access door shall be approximately 18" high and as wide as possible. The door shall be constructed aluminum coated with black Line-X with push button type latches.

PUMP ENCLOSURE ACCESS DOOR -- RIGHT SIDE UPPER

A pump panel access door shall be provided on the upper right side of the side mount pump enclosure. The access door shall be approximately 18" high and as wide as possible. The door shall be constructed aluminum coated with black Line-X with push button type latches.

PUMP PANEL -- SIDE MOUNT

The pump operator's panel, along with the lower left hand and right hand pump panels shall be constructed of Line-X aluminum material and be fastened to the pump enclosure with 1/4" stainless steel bolts.

The instrument area shall have a stainless steel continuous hinge that shall swing for easy access to gauges.

LEFT SIDE PUMP PANEL -- BOLTED

The pump panel installed on the left hand side of the pump enclosure shall be fastened to the pump enclosure with 1/4" stainless steel bolts.

HINGED PUMP PANEL -- RIGHT SIDE

The pump panel installed on the on the right hand side of the pump enclosure shall be hinged with push-button latches.

LABELS

Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel.

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

COLOR CODED PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards.

Innovative Controls permanent type nameplates and instruction panels shall be installed on the pump panel for safe operation of the pumping equipment and controls.

MIDSHIP PUMP PANEL LIGHTS -- LEFT SIDE

Three (3) Techiq E10-W0001-1 or equal LED lights with clear lenses shall be installed under an instrument panel light hood on the left side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

MIDSHIP PUMP PANEL LIGHTS -- RIGHT SIDE

Two (2) Tecniq E10-W0001-1 or equal LED lights with clear lenses shall be installed under an instrument panel light hood on the right side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

PUMP ENGAGED LIGHT

One (1) pump panel light shall be illuminated at the time the fire pump is engaged into operation. The remaining lights shall be controlled by a switch located on the operator's instrument panel.

MASTER DISCHARGE AND INTAKE GAUGES

Two (2) 4" diameter IC discharge pressure and intake gauges (30"-0-600 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

The master gauges shall have clear scratch resistant molded crystals with captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished chrome-plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case.

TEST TAPS

Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled.

WATER TANK GAUGE

A Fire Research Tank Vision Pro model WLA300-A00 tank indicator kit shall be installed on the pump panel. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

WATER TANKS

WATER TANK

The apparatus shall be equipped with a rectangular tank.

WATER TANK - 400 GALLON

The apparatus shall be equipped with a four-hundred (400) gallon polypropylene water tank. The tank shall be equipped with a three-inch (3") overflow pipe. The tank body and end bulkheads shall be constructed of .5" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to applicable NFPA standards. The tank shall carry a lifetime warranty.

The transverse and longitudinal .375" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The .5" thick cover shall be recessed .375" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booster tank.

The water fill tower shall be provided at front of the tank. The 0.5" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The overflow tube shall be installed in fill tower and piped with schedule 40 PVC pipe through the tank.

The water tank sump shall be located in the forward area of the tank. There will be a schedule 40 polypropylene tank suction pipe from the front of the tank to the tank sump. The tank drain and clean out shall be a 3.0" IPT schedule 80 female flange with plug, located in the bottom of the tank sump.

The pump to tank refill connection shall be a sized to mate with tank fill discharge line. A deflector shield inside the tank will also be provided.

The water tank manufacturer shall certify the capacity of the water tank prior to delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the purchaser when the apparatus is delivered.

WATER TANK FILL TOWER

A fill tower measuring approximately 10” x 10” square shall be provided on the water tank up to and including 500 gallons total capacity.

The apparatus shall be equipped with a polypropylene water tank. The tank body and end bulkheads shall be constructed of .75" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to applicable NFPA standards. The tank shall carry a lifetime warranty.

The transverse and longitudinal .375" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The .5" thick cover shall be recessed .375" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booster tank.

A combination vent/water fill tower shall be provided at front of the tank. The 0.5" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The overflow tube shall be installed in fill tower and piped with a minimum schedule 40 PVC pipe through the tank.

The water tank sump shall be located in the forward area of the tank. There will be a schedule 40 polypropylene tank suction pipe from the front of the tank to the tank sump. The tank drain and clean out shall be located in the bottom of the tank sump. The sump shall have a minimum 3" threaded outlet on the bottom to be used for a combination clean out and drain.

The pump to tank refill connection shall be a sized to mate with tank fill discharge line. A deflector shield inside the tank will also be provided.

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4” x 1” and a hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4” mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4” by 6” high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum

angle having minimum dimensions of 3" x 3" x 1/4" and shall be approximately 6" to 12" long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4" inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank.

Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method shall provide a liquid barrier, offering leak protection in the event of a weld compromise.

The tank shall be equipped with Polychromatic fill towers. The water fill tower shall be blue in color. The foam tank fill towers, if applicable, shall be yellow for foam A and green for foam B and black for any additional foam fill towers.

The water tank shall be certified for the capacity of the water tank prior to delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the purchaser when the apparatus is delivered.

The tank shall be manufactured by United Plastic Fabricating (UPF).

CHASSIS REQUIREMENTS FOR AERIAL APPARATUS

The following items shall be included with the chassis to operate the aerial device:

- Truck chassis with a selectable high idle system. High idle to be set at 1,200 rpm
- A red warning light installed in the driving compartment and visible to the driver to indicate if any outrigger is not in the stowed position.
- There shall be a (hot shift) PTO system mounted to the chassis transmission. The PTO assembly shall supply power to the hydraulic pump for all aerial operations. Electrical safety wiring shall be installed that requires the transmission be in neutral, or the fire pump engaged, and the parking brake set before the PTO will operate.
- A PTO engaged indicator light shall be installed in the cab of the apparatus.

BODY BUILDER REQUIREMENTS FOR AERIAL APPARATUS

The following items shall be installed by the body builder for the aerial device:

- Outrigger plates shall be installed on heavy aluminum brackets and installed adjacent to each outrigger.
- A preset relief valve capable of protecting the waterway system by relieving pressure through the dumping of water to the environment. Relief valve shall be plumbed to dump excess water below chassis frame. (N/A if the rear connection is an inlet only)
- A 1-1/2-inch minimum drain valve shall be installed at the low point of the waterway inlet system. Handle to operate drain valve shall be extended to rear of body.
- Reflective striping shall be installed on all stabilizers that protrude beyond the body of the apparatus.
- Warning signs for the aerial and outriggers shall be installed to meet the aerial manufacturer recommendations.

The following items are not required with the Smart Aerial application:

- A leveling bubble shall be installed on the rear of the truck, for side to side leveling.
- A leveling bubble shall be installed at the pump operator's panel, for front to rear leveling.
- There shall be a ladder alignment indicator provided on the turntable to indicate when the ladder is aligned with the travel support and may be lowered into it.

OUTRIGGER PAD STORAGE

Two (2) aluminum outrigger pad storage brackets capable of holding one (1) outrigger pad each shall be installed. There shall be one storage bracket located adjacent to each outrigger in an easily accessible location.

SAFETY HARNESS

All NFPA required life safety harnesses shall be provided and mounted by the Customer before the apparatus is placed into service.

MODULAR BODY

1/8" ALUMINUM BODY

The body shall be fabricated of aluminum extrusions, smooth aluminum sheet and aluminum treadplate.

The aluminum extrusion alloy shall be 6061 with a temper rating of T6, and have a tensile strength of 45,000 PSI and yield strength of 40,000 pounds. The aluminum extrusions shall 3" x 3" aluminum tubing, 1-3/4" x 3" aluminum tubing and 3" x 3" aluminum angle and specially designed extrusions, up to .250" wall thickness where applicable.

The smooth aluminum sheet material alloy shall be 5052 with a temper rating of H32, and have a tensile strength of 33,000 PSI and yield strength of 28,000 pounds.

The aluminum treadplate alloy shall be 3003 with a temper rating of H22, and have a tensile strength of 30,000 PSI and yield strength of 28,000 pounds.

The extrusions shall be designed as structural-framing members with the smooth aluminum and treadplate fabricated to form compartments, hosebeds, and floors. All aluminum material shall be welded together using the latest mig spray pulse arc welding system.

Compartment floors shall be of the sweep out design with the floor higher than the compartment door lip and to be water and dust proof. All compartments shall be made to the maximum practical dimensions to provide maximum storage capacity. To ensure maximum storage space, the apparatus shall be constructed without any void spaces between the body and the compartment walls. Double wall construction does not meet this requirement.

All exterior compartments shall have polished aluminum drip moldings installed above the doors where necessary to prevent water from entering the compartments.

Wheel well panels shall be formed aluminum that is welded in place. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. To fully protect the wheel well area from road debris and to aid in cleaning, a full depth radius wheel well liner shall be provided. The frame side of the wheel well area on each side of the opening shall be attached to the frame side of the front and rear compartments. All seams on the frame side of the body shall be welded and caulked to prevent moisture from entering the compartments.

The rear wheel wells shall be radius cut for a streamlined appearance. A fenderette shall be furnished at each rear wheel well opening, held in place with stainless steel fasteners.

FASTENERS

All aluminum and stainless steel components shall be attached using stainless steel fasteners.

Compartment door hinges, handrails and running boards shall be attached using minimum 1/4" diameter machine bolt fasteners.

3/16" diameter fasteners shall only be used in nonstructural areas such as door handles, trim moldings, gauge mounting, etc.

OUTRIGGER COVERS

Brushed stainless steel covers shall be attached to the extending outrigger assemblies.

COMPARTMENT FLOORS

The compartment floors shall be constructed of smooth aluminum material, to match the compartment interior walls.

SINGLE AXLE WHEEL AREA

For ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth plate that is welded in place.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 25") radius wheel well liner shall be provided. Wheel well liner shall be smooth aluminum to prevent corrosion.

FENDERETTES

The rear wheel wells shall be radius cut for a streamlined appearance. A polished aluminum fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners.

HOSEBED STORAGE AREA

The apparatus hosebody is to be properly reinforced without the use of angles or structural shapes, and free from all projections which might injure the fire hose.

The main hosebody of the aerial unit shall run along the right side of the apparatus body, above the lower body compartments. The width of the hosebed shall be from the side wall of the aerial torque box to the side sheet of the apparatus body.

ALUMINUM HOSEBED GRATING

The hose bed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized, radiused ribbed top surface. The slats shall be of widths approximately 3/4" high x 7.5" wide and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

HOSBED COVER

The hosebed cover shall be secured utilizing a Velcro fastening system at the front and sides of the hosebed body.

The vinyl cover shall be red in color.

SINGLE AXLE SUBFRAME AERIAL BODY

The apparatus body subframe shall be constructed entirely of heavy steel structural channel material.

The front subframe shall be attached to the chassis frame rails using heavy "U" bolt fasteners to allow removal of the subframe and body assembly from the chassis. There shall be a barrier provided between the subframe and body to prevent electrolysis.

The rear subframe and lower body platform support members shall be fabricated of 3.4 lb. per foot heavy channel and bolted to the frame rails.

This steel subframe shall carry the weight of the apparatus body, tank, water and equipment. This method of apparatus construction gives an excellent strength/weight ratio.

BODY WIDTH

The overall width of the aerial body shall not exceed 102".

COMPARTMENT DEPTH

The lower portion of the side compartments on the aerial body shall be 26" deep.

COMPARTMENT DEPTH

The side compartments on the aerial body shall be 26" deep the full height of the compartments.

COMPARTMENT DEPTH

The side compartments on the aerial body shall have the maximum available height and depth dimensions. These dimensions shall remain consistent for the full height and depth of the compartment.

ROLL UP DOOR CONSTRUCTION

The roll up door(s) shall be fabricated from aluminum extrusions and be manufactured and assembled in the United States.

The door slats shall be double-wall extrusions with dimensions of 1.366" high x .315" thick. The exterior surface shall be flat and the interior surface concave to deflect loose equipment to prevent the door from jamming. Each slat shall have interlocking end shoes to prevent the slat from moving side to side resulting in binding of the door. Each slat shall be separated by a co-

extruded PVC and rubber inner seal to prevent metal to metal contact and minimize dirt and moisture from entering the compartment. The inner seal shall not be visible from the exterior to maintain a clean appearance of door. The slats shall have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects.

The track shall be a one (1) piece aluminum assembly that has an attaching flange and finishing flange incorporated into the design that facilitates installation and provides a finished look to the door without additional trim or caulking. A low profile side seal shall be utilized to maximize usable compartment space.

A drip rail designed to prevent water from dripping into the compartment shall be provided. The drip rail shall have a built in replaceable non-contacting seal to eliminate scratching of the surface of the door.

Bottom rail extrusion must have smooth back to prevent loose equipment from jamming the door and have "V" shaped double seal to prevent water and debris from entering the compartment. The door latch system shall be a full width one (1) piece lift bar that enables the user to operate with one hand.

The roll mechanism shall have a clip system that connects the curtain slats to the operator drum to allow for easy tension adjustment without tools. A four (4) inch diameter counterbalanced operator drum to shall be incorporated to assist in lifting the door.

LEFT FRONT COMPARTMENT

There shall be two (2) full height compartments located at the front of the apparatus body. Each compartment shall be equipped with a full height single natural finish roll up door.

The compartments shall be equipped with the following:

LEFT FRONT COMPARTMENT

There shall be one (1) full height compartment located at the front of the body. The compartment shall be equipped with a full height single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT FRONT COMPARTMENT

There shall be one (1) full height compartment located forward of the rear wheels. The compartment shall be equipped with a full height single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT HIGH SIDE COMPARTMENTS

There shall be one (1) compartment above the rear wheels. The compartment shall be equipped with a single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT REAR COMPARTMENT

There shall be one (1) full height compartment located behind the rear wheels. The compartment shall be equipped with a single full height natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

ACCESS LADDER

There shall be a swing out and down access ladder supplied and installed on the left side apparatus, for accessing the aerial turntable. It shall be of an all-aluminum design and shall incorporate treads six (6") inches deep and no more than eighteen (18") inches apart. The ground to the first step dimension, on level ground, shall be no more than eighteen (18") inches.

The access ladder shall have integrated hand holds in the steps, to aid in the ascent/descent of the ladder.

When in the deployed position the ladder shall have an angle of approximately 75-degrees to facilitate ascending and descending the ladder. The ladder shall be retained in the stowed and deployed position by two (2) gas cylinders and shall not require the use of latches to hold it in position.

RIGHT FRONT COMPARTMENT

There shall be two (2) low compartments located ahead of the rear wheels. Each compartment shall be equipped with a single natural finish roll up door.

The compartment shall be equipped with the following:

RIGHT FRONT COMPARTMENT

There shall be one (1) low compartment located at the front of the body. The compartment shall be equipped with a single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT FRONT COMPARTMENT

There shall be one (1) low compartment located ahead of the rear wheels. The compartment shall be equipped with a single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT OVERWHEEL COMPARTMENT

There shall be no compartment above the rear wheels.

RIGHT REAR COMPARTMENT

There shall be one (1) low compartment located behind the rear wheels. The compartment shall be equipped with a single natural finish roll up door.

The compartment shall be equipped with the following:
One (1) louver with filter shall be installed in the compartment.

ADJUSTABLE SHELVING TRACKS

The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

REAR COMPARTMENT

There shall be one (1) compartment located at the rear of the apparatus. The compartment, located within the aerial torque box, shall have provisions to accommodate ladders and pike poles.

The compartment shall be equipped with a natural finish roll up door.

COMPARTMENT LIGHTS

Two (2) ROM vertically mounted roll-up compartment LED V3 door lights shall be installed one each side of the door opening. The compartment lights shall be integrated into the roll-up door tracks with the light actuation with the door opening.

The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat buildup.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

SLIDE OUT REAR LADDER AERIAL TORQUE BOX

Ground ladders and pike poles shall be accessed from the rear of the apparatus. All ladders shall be mounted on individual brackets and slide on composite material so as not to damage the main beams of the ladders. Pike poles and the folding ladder shall be stored in individual storage area. Ladders shall have stops provided on the front of all slides so ladders will not slide forward during emergency braking conditions.

LADDER SOURCE

New ground ladders shall be provided by the body builder.

PIKE POLE MOUNTING BRACKET

Six (6) tube shall be provided for pike pole mounting. The tube shall have a 2" interior diameter and shall be mounted inside of the apparatus body.

PIKE POLE SOURCE

The pike poles shall be provided by the body builder.

AERIAL REAR BUMPER

A 4" rear bumper shall be provided at the rear of the apparatus body, and be easily removable for replacement or repair. The rear bumper shall be constructed of .188" aluminum diamond plate or equal non-slip surface in compliance with NFPA #1901 standards.

FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body compartment from the lower edge to the top of the compartment doors.

CATWALKS - DOOR HEADER

The door header and the top of the compartments shall be aluminum treadplate.

REAR BODY PROTECTION PANELS

The rear body panels of the body shall be a smooth material, to allow for the proper application and installation of a "Chevron" stripe on the rear.

FOLDING STEPS LEFT SIDE FRONT

Three (3) folding steps of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a Truck Lite light mounted below the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the left side front compartment face.

FOLDING STEP RIGHT FRONT

Four (4) folding steps of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a Truck Lite light mounted below the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the right side front compartment face.

EXTRUDED ALUMINUM RUB RAILS

Full body length polished aluminum rub rails shall be bolted in place on the lower right and left body sides. The side rub rails shall be a heavy extruded aluminum "C" channel.

NYLON SPACERS FOR RUB RAILS

There shall be nylon spacers provided between the rub rail and the body. This shall allow wash out and replacement in the event of damage.

FUEL TANK ACCESS PANEL

There shall be a removable panel in the bottom of the torque tube, used to gain access to the fuel tank and fuel gauge-sending unit.

FUEL PIPING AND FILL CAP

There shall be a fuel fill cap provided in the recessed area of the left side aerial egress steps clearly marked, "DIESEL FUEL ONLY". The fill shall be piped to the fuel tank.

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the left side of the apparatus, ahead of the rear wheels.

A Fire Shopp Inc. breathing air cylinder storage compartment shall be provided in the rear wheel well area of the apparatus body.

The compartment shall be constructed black polymer and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

7.75" diameter opening
101 body 26" deep
98 body 24.50" deep
95 body 23" deep

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the left side of the apparatus, behind of the rear wheels.

A Fire Shopp Inc. breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the right side of the apparatus, ahead of the rear wheels.

A Fire Shopp Inc. breathing air cylinder storage compartment shall be provided in the rear wheel well area of the apparatus body.

The compartment shall be constructed black polymer and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

7.75" diameter opening
101 body 26" deep
98 body 24.50" deep
95 body 23" deep

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

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PAINT – LETTERING and STRIPING

BODY PAINT PROCESS

All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating. If applicable, any and all accessory times shall be removed from the body prior to cleaning and painting. Any accessory items that are to be painted, shall be painted separately and installed after the body is painted and cured.

All seams shall be caulked, both inside and along the exterior edges, with a urethane automotive sealant to prevent moisture from entering between any body panels.

The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG CFX436) prior to any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG CFX436) to remove any contaminants on the surface.

The next two to four coats (depending on need) shall be a PPG DelFleet F4936 High Solids Epoxy Gray Primer. The film build shall be 4-6 mils when dry. The primer surfacer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure maximum gloss of the paint. The last step is the application of at least three coats of PPG DelFleet polyurethane FBC-color, the film build being 2-3 mils dry. Followed by three coats PPG DelFleet F3906 high build clear, the film build being 2-3 mils dry. This shall provide a UV barrier to prevent fading and chalking.

All products and technicians are certified by PPG every two (2) years.

APPARATUS COLOR

The apparatus shall be ____ in color.

MATCH CHASSIS RED

INTERIOR COMPARTMENT FINISH

Ten (10) apparatus side compartment interiors are to be painted with a spatter finish material. The compartments shall be cleaned with a grease remover, and then the surface sanded and prepared for painting. The compartment shall be provided with two (2) coats of white epoxy. The compartments are then coated with a splatter paint top coat.

WHEEL PAINTING

The exterior faces of the front wheels and outer rear wheels only, shall be finish painted to match the apparatus body. Wheels shall be properly prepared and finished with primer coats and top coats as specified.

TOUCH-UP PAINT

One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery.

LETTERING

The dealer shall supply the apparatus lettering.

REFLECTIVE STRIPING

A 1" x 6" x 1" wide 3M brand Scotchlite reflective multi-stripe shall be affixed to the perimeter of the vehicle. There shall be a 1" gap between each of the stripes. Striping shall conform to applicable NFPA requirements. At least 50% of the perimeter length of each side and width of the rear, and at least 25% of the perimeter width of the front of the vehicle shall have reflective striping.

The striping shall be applied in a large "Z" pattern.

COLOR OF STRIPING MATERIAL

The color of the striping material shall be white.

CHEVRON STRIPING

The entire rear portion of the body shall have 3M reflective striping installed. The chevron style striping shall be applied at a 45-degree upward angle pointing towards the center upper portion of the rear panel.

REFLECTIVE TAPE ON OUTRIGGERS

The outriggers that extend beyond the side of the body shall have white reflective tape applied to both the front and rear facing sides.

YELLOW SAFETY TAPE - STANDING & WALKING SURFACES

The apparatus shall meet NFPA 1901 15.7.1.6 designating any horizontal standing or walking surface higher than 48-in (1220 mm) from the ground and not guarded by railing or structure at

least 12-in (300 mm) high shall have at least a 1-in (25 mm) wide safety yellow line delineation that contrasts with the background to mark the outside perimeter of the designated standing or walking surface area, excluding steps and ladders.

AERIAL INSTRUCTION LABELS

Safety and instructional labels shall be applied at all necessary areas on the aerial device to identify points critical to the safe operation and maintenance of the aerial.

LEVELING GAUGE

A leveling gauge shall be installed on the rear to show when the apparatus is level from side to side. A second gauge shall be provided on the rear to show when the apparatus is level from front to back. The approximate size of the leveling gauges shall be 3" x 1-1/2".

LOOSE EQUIPMENT

WHEEL CHOCKS WITH MOUNTS

A pair of Zico Model SAC-44 Quic-Chok folding wheel chocks shall be provided and mounted under the apparatus body with model SQCH-44H horizontal mounting brackets.

ROOF LADDER

Two (2) Duo Safety Model 875-A, 16 foot aluminum roof ladder with folding steel roof hooks on one end and steel spikes on the other end shall be provided on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

EXTENSION LADDER

One (1) Duo-Safety Model 900-A, 24 foot two (2) section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

EXTENSION LADDER

One (1) Duo-Safety Model 1225-A, 35 foot three (3) section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

FOLDING LADDER

One (1) Duo Safety Model 585-A, 10 foot folding aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

COMBINATION LADDER

One (1) Duo Safety Model 300-A, 10/15 foot combination aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

PIKE POLE

Two (2) 4' pike pole with "D" handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

One (1) 6' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

One (1) 8' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

One (1) 10' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

One (1) 12' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

WARRANTIES

PAINT WARRANTY FIVE YEAR

The AKZO paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of FIVE (5) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus chassis, manufactured and painted by Rosenbauer Motors, LLC, shall be covered for the following paint failures as outlined on the guarantee certificate:

- Peeling or delaminating of the topcoat and/or other layers of paint.

- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective AKZO Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

Note: Surety bond, if required, will cover the standard one-year warranty period only and will not cover any extended warranties allowed by the seller or other component manufacturers.

CAB STRUCTURE WARRANTY

The cab structure shall be warranted for a period of ten (10) years with the complete details of the warranty outlined in a document provided upon request.

TRANSMISSION WARRANTY

The Allison EVS transmission shall be warranted for a period of five (5) years with the complete details of the warranty outlined in a document provided upon request.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever comes first, with the complete details of the warranty outlined in a document provided upon request.

FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty with the complete details of the warranty outlined in a document provided upon request.

FRONT AXLE WARRANTY

The front axle shall be warranted by Hendrickson for five (5) years or 500,000 miles, whichever comes first, under the general service application.

REAR AXLE WARRANTY

The rear axle(s) shall be warranted by Meritor for five (5) years with unlimited miles under the general service application.

CAB AND CHASSIS WARRANTY

The cab and chassis shall carry a twelve (12) month warranty providing limited parts and labor from the date the complete apparatus is delivered to the end user. The complete details of the warranty shall be outlined in a document provided upon request.

BODY WARRANTY

We warrant each new motorized fire apparatus manufactured by ROSENBAUER AMERICA, LLC for a period of ONE YEAR from the date of delivery, except for chassis and other components noted herein.

Under this warranty we agree to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at the option of ROSENBAUER AMERICA, LLC, made available for our inspection at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within one year from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to defective material or workmanship.

The warranty on the chassis and chassis supplied components, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

This warranty will not apply to any fire apparatus that has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability.

This warranty shall not apply to those items that are usually considered normal maintenance and upkeep services: including, but not limited to, normal lubrication or proper adjustment of minor auxiliary pumps or reels.

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

ALUMINUM BODY WARRANTY - FIVE YEAR

Rosenbauer America, LLC warrants to the original purchaser only, that the all-aluminum body, fabricated by Rosenbauer America, LLC, under normal use and with reasonable maintenance, be structurally sound and will remain free from corrosion perforation for a period of FIVE (5) years.

This warranty does not apply to the following items that are covered by a separate warranty: paint finish, hardware, moldings, and other accessories attached to this body. In addition, this warranty does not apply to any part or accessory manufactured by others and attached to this body.

ROSENBAUER AMERICA, LLC MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE ALUMINUM BODY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND HEREBY DISCLAIMED.

Rosenbauer America, LLC will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Rosenbauer America, LLC elects to repair this body, the extent of such repair shall be determined solely by Rosenbauer America, LLC, and shall be performed solely at the Rosenbauer America, LLC factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

Rosenbauer America, LLC will not be liable for damages and under no circumstances will its liability exceed the price for a defective body. The remedies set forth herein are exclusive and in substitution for all other remedies to which the purchaser would otherwise be entitled.

Rosenbauer America, LLC will be given a reasonable opportunity to investigate all claims. The purchaser must commence any action arising out of, based upon or relating to agreement or the breach hereof, within twelve months from the date the cause of the action occurred.

Note: *Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.*

GALVANIZED SUBFRAME WARRANTY

Subject to the provisions, limitations and conditions set forth in this warranty, Rosenbauer America, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser only that each new hot dip galvanized body subframe (exclusive of paint finish and hardware) is structurally sound and free of all structural defects of both material and workmanship and further warrants that it will maintain such structural integrity for the duration of ownership by the original purchaser. This warranty terminates upon transfer of possession or ownership by the original purchaser.

This warranty is conditioned upon normal use and reasonable maintenance of such subframe; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by

customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Rosenbauer America, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on them to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF ROSENBAUER AMERICA, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.

Note: *Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.*

PAINT WARRANTY FIVE YEAR

The manufacturer shall provide a five (5) year paint warranty for all portions of the apparatus that they have painted. The manufacturer shall supply details of their warranty information with their bid submission.

PUMP WARRANTY

Waterous warrants, to the original buyer only, that products and parts manufactured by Waterous will be free from defects in material and workmanship under normal use and service for a period of seven (7) years from the date the product is first placed in service, or seven and one half 7-1/2 years from the date of shipment by Waterous, whichever period will be the first to expire; provided the buyer notifies Waterous in writing, of the defect in said product within the warranty period, and said product is found by Waterous to be conforming with the aforesaid warranty.

When required in writing by Waterous, defective products must be promptly returned by the buyer to the Waterous Company at Waterous' plant at South St. Paul, Minnesota, or at such other place as may be specified by Waterous with transportation and other charges prepaid. A returned materials authorization (RMA) is required for all products and parts and may be requested by

phone, fax or mail. The previously mentioned warranty excludes any responsibility or liability of Waterous for:

- Damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes or improper maintenance, or attributable to written specifications or instructions furnished by buyer.
- Defects in products manufactured by others and furnished by Waterous hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, Waterous will assign to the buyer, if requested by buyer.
- Any product or part, altered, modified, serviced or repaired other than by Waterous, without its prior written consent.
- The cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.
- Normal wear items (packing, strainers, filters, light bulbs, anodes, intake screens, etc.)
- This warranty is subject to Waterous' conditions of sale (Waterous Company form number F-2190 as currently in effect all of which are herein incorporated and by this reference made a part hereof.

All other warranties are excluded, whether expressed or implied by operation of law or otherwise, including all implied warranties of merchantability or fitness for purpose. Waterous shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from breach of any of the terms of this limited warranty or from the sale, handling, or use of any other product or part. Waterous' liability hereunder, either for breach of warranty or for negligence, is expressly limited at Waterous' option:

- To the replacement at the agreed point of delivery of any product or part, which upon inspection by Waterous or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
- To the repair of such product or part, or
- To the refund or crediting to buyer of the net sales price of the defective product or part.
- Buyer's remedies contained herein are exclusive of any other remedy otherwise available to the buyer.

STAINLESS STEEL PLUMBING WARRANTY

The manufacturer shall provide a ten (10) year warranty on the stainless steel plumbing components and installation. The manufacturer shall supply details of their warranty information with their bid submission.

WATER TANK WARRANTY

UNITED PLASTIC FABRICATION INC. Warrants each UPF POLY-TANK IIE Booster/Foam tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle (vehicle must be actively used in fire suppression). The UPF POLY-TANK IIE must be installed in accordance with the United Plastic Fabricating installation manual. Every UPF POLY-TANK IIE is thoroughly inspected and tested for leaks before leaving our facility. Should any problems develop with your UPF POLY-TANK IIE booster/foam tank and will not meet performance criteria during the service life of the vehicle, notify UPF in writing or call our TOLL-FREE SERVICE HOT LINE 1-800-USA-POLY. Provide UPF with the serial number and a description of the problem. If the tank problem would render the truck out of service, UPF will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank. (This time period is for North America only). If the vehicle can remain in service, UPF will dispatch a service technician within a mutually agreed upon time period.

We will repair, or at our option, replace the tank with a new UPF POLY-Tank IIE. UPF will cover customary and reasonable costs to remove and install the UPF POLY-TANK IIE. This warranty will not cover tanks that have been improperly installed, misused or abused, and the serial number must not have, been altered, defaced or removed. UPF will not cover any unauthorized third-party repairs or alterations. Any of these actions may void the warranty.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF UNITED PLASTIC FABRICATION, INC.

This warranty contains the entire warranty. It is the sole warranty and price agreements or representation, whether oral or written, are either merged herein or expressly cancelled. UNITED PLASTIC FABRICATION, INC. Neither assumes, nor authorizes any person supposing to act on its behalf, to change, nor assume for it, any warranty or liability concerning its product.

IN NO EVENT WILL UNITED PLASTIC FABRICATION, INC BE LIABLE FOR AN AMOUNT IN EXCESS OF THE PRESENT RETAIL, PURCHASE PRICE PLUS INSTALLATION AND REMOVAL COST OF THE BOOSTER TANK, FOR ANY LOSS OR DAMAGE, WHETHER DIRECT OR INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHERWISE ARISING OUT OF FAILURE OF ITS PRODUCT.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow exclusion or limitation of incidental of incidental or

consequential damage, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

MISCELLANEOUS

STATIC LOAD SEAT TEST INFORMATION

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. To reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208.

The materials used in construction of the seat shall also have successfully completed testing regarding the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

CAB TEST INFORMATION

The cab as built shall have successfully completed the pre-load side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests shall have been witnessed by and attested to by an independent third party. The test results shall have been recorded using cameras, high speed imagers, accelerometers, and strain gauges.

Documentation of the testing shall be provided upon request.

CAB INTEGRITY CERTIFICATION

The manufacturer shall provide a cab crash test certification with this proposal including SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading for Heavy Trucks and SAE J2420 COE Frontal Strength Evaluation - Dynamic Load for Heavy Trucks.

CAB TEST INFORMATION

ROOF CRUSH

The cab shall be subjected to a roof crush test of 120,000 pounds exceeding the requirements of ECE 29 criteria. The 120,000-pound requirement is important to ensure the most structurally sound and safe cab in the event of a crash or roll over.

SIDE IMPACT

The cab shall be subjected to dynamic moving barrier slammed into the side of the cab at 7.5 mph, striking with an impact of 15,157-foot pounds of energy. This test will closely represent the forces a cab would incur in a rollover incident.

FRONTAL IMPACT

The cab shall withstand a frontal force produced from a moving barrier slammed into the front of the cab traveling at 10.5 mph, striking with an impact of 42,587-foot pounds of energy.

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

OPERATION AND PARTS LIST MANUALS

Each cab and chassis shall include two (2) electronic copies of the operation manuals and parts listings. The manuals shall include information specific to the components included on the apparatus.

ENGINE AND TRANSMISSION MANUALS

One (1) paper copy of the specific engine and transmission manuals shall accompany each cab and chassis.

AS BUILT WIRING DIAGRAMS

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring. The wiring schematics shall be developed on a software program such as VeSys Design or equal that provides continuity in files and diagrams. The software shall allow you to trace through the design schematics to identify cross-referenced items such as in-line connectors and wires. The software shall be interactive which allows you to view one electrical assembly drawing, click on a wire routing and the program will take you to the related circuit assembly or termination point. The software shall also provide a searchable function allowing you to view multiple diagrams using readily available pdf viewers. The digital copy of the wiring schematics shall be compatible with handheld devices such as I-Pads.

USB STORAGE

For ease of service the chassis will come with an on-board USB flash drive. The flash drive shall have a minimum of 8 GB of storage capacity; and shall be located behind the access panel on the driver side kick panel, next to the data port for the engine.

The following items shall be stored on the Flash Drive. No Exception.

- As built wiring diagrams
- Plumbing diagram
- Chassis, body and aerial manuals

The USB shall be accessible through a 3-foot (3') USB-A to USB-B cable provided by the manufacture with the completed vehicle.

ROAD SAFETY KIT

- One (1) 2-1/2# ABC DOT Approved fire extinguisher shall be provided. The fire extinguisher shall be shipped loose with the chassis.
- One (1) set of DOT approved hazard triangles shall be supplied with the chassis. They shall be stored in a plastic case and shipped loose with the chassis.
- One (1) first aid kit

NFPA 2016 STANDARDS

This unit shall comply with the NFPA standards effective January 1, 2016.

Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated shall be provided which states the overall height, length, and gross vehicle weight rating.

The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company shall designate, in writing, which is qualified to witness and certify test results.

BODY MANUAL - PRINTED

Rosenbauer shall provide with the vehicle upon delivery, one (1) complete delivery manual. This manual shall be in a notebook type binder, with reference tabs for each section of the vehicle.

Within each section shall be:

- Individual component manufacturer instruction and parts manuals
- Warranty forms for the body
- Warranty forms for all major components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instruction and drawings for major parts
- Visual graphics and electronic photos for the installation of major parts
- Necessary normal routine service forms, publications and components of the body portion of the apparatus
- Technical publications for training and instruction on major body components
- Warning and safety related notices for personnel protection
- Cab and chassis manuals on parts, service and maintenance shall be provided

IN PROCESS PHOTOS

There shall be a series of Fire Ace photos provided as the apparatus progresses through the production process. There will be a minimum of four (4) photos per interval and a total of six intervals, one (1) upon chassis arrival, four (4) during construction and one (1) upon completion.

NFPA AERIAL/QUINT EQUIPMENT ALLOWANCE

In compliance with the current NFPA 1901 guidelines, the apparatus shall be engineered to provide an allow of 2500 pounds of fire department provided loose equipment.

CONTRACT CHANGE NOTICE

The quoted delivery time is based upon our receipt of the specified materials required to produce the apparatus in a timely manner. "Delivery" means the date company is prepared to make physical possession of vehicle available to the customer.

The Company shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond the Company's control which make the Company's performance impracticable, including but not limited to civil wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or

manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, pandemics, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.

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

FINANCIAL STABILITY SPECIFICATIONS

With high-profile instances of fire apparatus manufacturers encountering financial difficulties, it is imperative that fire departments be diligent in evaluating the financial position of the companies they solicit to build on their emergency response vehicles. A contract entered into with a company on shaky ground is a dangerous prospect, since conducting business with a manufacturer in such condition could open the department to monumental problems.

Take, for instance, the growing theme of manufacturers *requiring* as opposed to *offering* pre-payment and progressive payment options with a corresponding discount off the price of a vehicle. Such offers are made with an ulterior motive in mind, as it can be generally inferred that manufacturers requiring pre-payments and progressive payments do so because they need your cash *today* to fund production of other vehicles already in the backlog.

Should problems arise, as has been the case in situations too numerous to mention, your department risks losing any down payments already made or even the entire cost of a piece of equipment should certain pre-pay discount situations go awry.

While pre-payment discounts may be enticing, it is important to know just how stable the manufacturer seeking your funds is before you make that commitment. If you enter into one of these agreements and the manufacturer hits a rough patch, it is you that will be hurting, because your funds may not be recoverable. However, if you enter into a contract with a financially sound manufacturer, you will reap all of the benefits of a well-built truck at a lower cost. You may equally, by taking advantage of the time-value of money, be able to afford more truck than initially thought, because funds saved by leveraging pre-payment options could allow you get some added features that you might not necessarily have been able to afford.

With this in mind, it must be noted that Rosenbauer is a company with rock-solid financial stability. This is a statement not made lightly, as we can prove it to you. We can provide language that you can insert into your bid specifications that stipulates that in order for bids to be accepted by a fire department, the company bidding must meet several fiscal criteria.

The first criteria call for the successful bidder to meet a debt-to-equity ratio not exceeding a 2.0 rating. Rosenbauer presently stands at a 1.51 rating, which is well-below the accepted rating. This low number results from Rosenbauer owning more assets with a marginal debt service. This means we are not using lenders to fund our operations, nor our growth.

The second requirement is that the debt coverage ratio of the successful body builder exceeds a 100 rating. The higher the number, the better able a company is to meet its payment obligations with banks and creditors. Rosenbauer's number is at 279.6, which is nearly three times the required amount. The higher the debt coverage ratio, the more easily and more fluidly a company is positioned to pay its monthly obligations and operating costs.

The third criteria require that the equity ratio of the successful bidder must exceed .30 rating. A higher equity ratio indicates that the body builder has increased flexibility to meet its financial obligations which translates into greater financial stability. Rosenbauer currently has an equity ratio of .387 which is well above the accepted rating and an excellent indicator of financial strength.

When exploring and evaluating various manufacturers to consider for building your apparatus, there is little doubt you will find one that stands on as firmly a financial ground as Rosenbauer. While others are experiencing stressful issues that raise doubts as to the company's long-term viability, Rosenbauer continues to demonstrate a strengthening of its financial position in the apparatus manufacturing industry. Because Rosenbauer meets and exceeds all the above-stated financial bid requirements, we are best positioned to ensure customers of a strong relationship with the company, which cannot be claimed by most of our competitors in this volatile market.

The Rosenbauer America Dun and Bradstreet number is 02-447-3584. To acquire a Dun and Bradstreet report, telephone them at 1-800-234-3867 (in Canada 800-463-6362) or visit their web site address at www.dnb.com. Dun and Bradstreet is nationally recognized, independent financial analysis company.

ELECTRONIC STABILITY CONTROL

Electronic stability control shall be supplied on the chassis.

ENGINEERING BLUEPRINTS

ROSENBAUER has submitted "proposal" blueprints which are “representative” of the vehicle being proposed and these have been generated on computer-aided-design (CAD) equipment.

The blueprints are provided as follows:

Sheet No. 1:

- Left side exterior view
- Right side exterior view
- Rear exterior view
- Front view
- Top View

ROSENBAUER shall provide construction drawings for approval prior to actual construction of the vehicle.

The design of the equipment is in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements, which might cause injury to personnel or equipment.

All oil, hydraulic, and air tubing lines and electrical wiring shall be located in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through-frame connector is necessary.

Parts and components will be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.

CHANGE ORDERS

To ensure the proper engineering and construction of the purchaser's custom fire apparatus in a timely manner, the contractor shall consider the order final and complete after any changes made during the pre-construction conference are mutually approved. Change orders requested after the pre-construction conference are discouraged. It shall be understood and agreed that any changes, if approved, after the order has been released to Engineering, shall constitute a valid cause for production delay and without penalty to the contractor.


WELCOME TO THE WORLD OF
rosenbauer
Firefighting Technology