LC
02/09/23
Item No. 5

ORDINANCE 2023-02-09-0077

APPROVING A CONTRACT WITH SIDDONS-MARTIN EMERGENCY GROUP, LLC, TO PROVIDE AN AERIAL PLATFORM LADDER TRUCK FOR THE SAN ANTONIO FIRE DEPARTMENT FOR A TOTAL COST OF $1,995,819.00. OF THIS AMOUNT, $1,515,752.17 WILL BE FUNDED THROUGH THE ASSISTANCE TO FIREFIGHTERS GRANT AND MATCHING FUNDS IN THE AMOUNT OF $480,066.83 FROM THE FY 2023 GENERAL FUND ADOPTED BUDGET. THIS FUNDING IS CONTINGENT UPON AWARD OF THE GRANT; IF THE GRANT IS NOT AWARDED, THE PURCHASE OF THE TRUCK IN THE AMOUNT OF $1,995,819.00 WILL BE FUNDED THROUGH MUNICIPAL LEASE.

* * * * *

WHEREAS, an offer was submitted by Siddons-Martin Emergency Group, LLC, to provide the San Antonio Fire Department with an aerial platform ladder truck for a total cost of $1,995,819.00, using the Houston-Galveston Area Council (HGAC) contract number FS12-19; and

WHEREAS, this aerial platform ladder truck, a heavy-duty vehicle, will be used for fighting fires and for other emergency response requirements; and

WHEREAS, this purchase meets the requirements under the terms of the Houston-Galveston Area Council of Governments Cooperative Purchasing Agreement adopted by the City of San Antonio on October 10, 1996 through Resolution No. 96-41-48, **NOW THEREFORE:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SAN ANTONIO:

SECTION 1. The offer from Siddons-Martin Emergency Group, LLC, to provide the San Antonio Fire Department with an aerial platform ladder truck for a total cost of $1,995,819.00 is hereby accepted, subject to and contingent upon the deposit of all required bonds, performance deposits, insurance certificates and endorsements. A copy of the bid tabulation and contract is attached hereto and incorporated herein for all purposes as **Exhibit I**.

SECTION 2. Funding for this ordinance in the amount of $1,993,819.00 is available in Fund 11001000, Cost Center 2015070001 and General Ledger 5709080 as part of the Fiscal Year 2023 Adopted Budget approved by City Council.

SECTION 3. Funding for this ordinance in the amount of $2,000.00 is available in Fund 11001000, Cost Center 2015070001 and General Ledger 5201040 as part of the Fiscal Year 2023 Adopted Budget approved by City Council.

SECTION 4. Payment is authorized to Siddons-Martin Emergency Group, LLC, and should be encumbered with a purchase order.

SECTION 5. The financial allocations in this ordinance are subject to approval by the Deputy Chief Financial Officer, City of San Antonio. The Deputy Chief Financial Officer may, subject to concurrence by the City Manager or designee, correct allocations to specific SAP Fund Numbers, SAP Project Definitions, SAP WBS Elements, SAP Internal Orders, SAP Fund Centers, SAP Cost Centers, SAP Functional Areas, SAP Funds Reservation Document Numbers, and SAP GL Accounts as necessary to carry out the purpose of this ordinance.

SECTION 6. This ordinance is effective immediately upon passage by eight or more affirmative votes; otherwise, it is effective on the tenth day after passage.

PASSED and APPROVED this 9th day of February, 2023.

M A Y O R
Ron Nirenberg

ATTEST:

Debbie Racca-Sittre, City Clerk

APPROVED AS TO FORM:

Andrew Segovia, City Attorney

5. **2023-02-09-0077**

Ordinance approving a contract with Siddons-Martin Emergency Group, LLC, to provide an aerial platform ladder truck for the San Antonio Fire Department for a total cost of $1,995,819. Of this amount, $1,515,752.17 will be funded through the Assistance to Firefighters Grant and matching funds in the amount of $480,066.83 are from the FY 2023 General Fund Adopted Budget. This funding is contingent upon award of grant; if the grant is not awarded, the purchase of the truck in the amount of $1,995,819 will be funded through a municipal lease. [Ben Gorzell Jr., Chief Financial Officer; Troy Elliott, Deputy Chief Financial Officer, Finance]

Councilmember Courage moved to Approve on the Consent Agenda. Councilmember Castillo seconded the motion. The motion carried by the following vote:

Aye: Nirenberg, Bravo, McKee-Rodriguez, Castillo, Cabello Havrda, Courage, Perry
Absent: Viagran, Rocha Garcia, Pelaez

LC
02/09/23
Item No. 5

Exhibit I

City of San Antonio Bid Tabulation

Exhibit I

Opened:	December 15, 2022		HGAC
For:	SAFD Aerial Platform Ladder		Siddons-Martin Emergency Group 1362 E. Richey Rd
6100016339		JDLR	Houston, TX 77073
Item	**Description**	**Quantity**	512-848-5847
1	Pierce Velocity Platform Ladder	1	
	Price Each:		$1,993,819.00
	Extended price:		$1,993,819.00
	Year, Make & Model Offered		2025 or 2026 Pierce Velocity Aerial Whatever is current at the time of build
	Specific Make & Model of Motor Offered: (Include SAE NET HP)		Paccar MX13 510 HP
	Transmission Offered:		Allison EVS 4500
	Vehicle Warranty:		1 Year
	Warranty Service Provider Facility Name:		Siddons Martin Emergency Group Kirby
	Warranty Service Provider Facility Address:		5511 Binz-Engleman Rd San Antonio, TX 78219
	Delivery		1095 Days
	Production Cut-off Date for Current Year Model		January 1, 2023
	Last day order can be placed without missing cut-off date for current year model		January 1, 2023
	Can bidder provide bid items after cut-off date:		1 Unit only
2	Cooperative Fee	1	
	Price Each:		$2,000.00
	Extended price:		$2,000.00
	Payment Terms		Net 30
	Total:		$1,995,819.00
	Total Award:		**$1,995,819.00**

CITY OF SAN ANTONIO
Finance Department, Purchasing Division

REQUEST FOR OFFER ("RFO") NO.: 6100016339

SAFD PLATFORM LADDER TRUCK

Date Issued: DECEMBER 8, 2022

RESPONSES MUST BE RECEIVED **NO LATER** THAN:
10:00 AM, CENTRAL TIME, DECEMBER 15, 2022

Responses may be submitted by any of the following means:
Electronic submission through the Portal
Electronic submission by e-mail

Bid Bond: None Performance Bond: None Payment Bond: None Other: None

See Supplemental Terms & Conditions for information on these requirements.

Affirmative Procurement Initiative: None DBE / ACDBE Requirements: None

See Instructions for Offerors and Attachments sections for more information on these requirements.

Pre-Submittal Conference: None

Staff Contact Person:
Jody De La Rosa
Procurement Specialist II

Email: jody.delarosa@sanantonio.gov
Phone Number: 210-207-7024

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003 - INSTRUCTIONS FOR OFFERORS

Submission of Offers.

Submission of Offer's. ***Offer(s) maybe submitted through the Portal or by E-mail**

Submission of Electronic Offer's. Submit one offer electronically by the due date provided on the Cover Page. All times stated herein are Central Time. Any offer or modification received after the time and date stated on the Cover Page shall be rejected. All forms in this solicitation which require a signature must have a signature affixed thereto, either by manually signing the document, prior to scanning it and uploading it with your submission, or affixing it electronically.

Submission of Offers by Email. Submit one document by email to the Staff Contact Person, by the due date provided on the Cover Page. All times stated herein are Central Time. Any offer or modification received after the time and date stated on the Cover Page shall be rejected.

Modified Offer. Offer's may be modified provided such modifications are received prior to the time and date set for submission of Offer, and submitted in the same manner as original offer **"electronically"**. Electronic offer's, a modified offer will automatically replace a prior offer submission. See below for information on submitting Alternate Offer's.

City shall not be responsible for lost or misdirected offers or modifications.

For electronic offers, Offeror's electronic submission, with accompanying affirmations, constitutes a binding signature for all purposes.

Offerors are cautioned that they are responsible for the security of their log on ID and password, since unauthorized use could result in Offeror's being held liable for the submission.

Certified Vendor Registration Form. If Offeror has not completed the City's Certified Vendor Registration (CVR) Form, Offeror is required to do so prior to the due date for submission of offers. The CVR form may be accessed at http://www.sanantonio.gov/purchasing/. Offerors must identify the correct name of the entity that will be providing the goods and/or services under the contract. No nicknames, abbreviations (unless part of the legal title), shortened or short-hand names will be accepted in place of the full, true and correct legal name of the entity.

Alternate Offers. Alternate offers may be allowed at the sole discretion of City.

Electronic Alternate Offers Submitted Through the Portal. All alternate offers are recorded with original offers when submitted electronically.

Catalog Pricing. (This section applies to offers using catalog pricing, unless this is a cooperative purchase.)

The offer will be based on manufacturer's latest dated price list(s). Said price list(s) must denote the manufacturer, latest effective date and price schedule.

Offerors shall be responsible for providing one copy of the manufacturer's catalog for each manufacturer for which an offer is submitted. Offeror shall provide said catalog at the time of submission of its offer. Manufacturers' catalogs may be submitted in any of the following formats: paper copy or CD ROM for offer(s) submitted on paper, or PDF file for offers submitted electronically.

Offerors may submit price lists other than the manufacturer's price list. Said price list(s) must denote the company name, effective date and price schedule. These price lists are subject to approval of the City Finance Department-Purchasing Division.

Specified items identified herein, if any, are for overall offer evaluation and represent the commonly and most used items. Net prices entered for those specified items must reflect the actual price derived from quoted price list less all discounts offered.

Restrictions on Communication.

Offers are prohibited from communicating with: 1) City officials, as defined by §2-62 of the City Code of the City of San Antonio, regarding the RFO or offers from the time the RFO has been released until the contract is posted for consideration as a City Council agenda item during a meeting designated as an "A" session; and 2) City employees from

the time the RFO has been released until the contract is awarded. These restrictions extend to "thank you" letters, phone calls, emails and any contact that results in the direct or indirect discussion of the RFO and/or offer submitted by offeror. Violation of this provision by offeror and/or its agent may lead to disqualification of Offeror's offer from consideration.

Exceptions to the restrictions on communication with City employees include:

Offerors may ask verbal questions concerning this RFO at the Pre-Submittal Conference.

Offerors may submit written questions, or objections to specifications, concerning this RFO to the Staff Contact Person listed on the Cover Page on or before one calendar day prior to the date offers are due. Questions received after the stated deadline will not be answered. Questions submitted and the City's responses will be posted with this solicitation. All questions shall be sent by e-mail or through the portal.

Offerors may provide responses to questions asked of them by the Staff Contact Person after responses are received. The Staff Contact Person may request clarification to assist in evaluating the Offeror's response. The information provided is not intended to change the offer response in any fashion. Such additional information must be provided within two business days from City's request.

Offerors and/or their agents are encouraged to contact the Small Business Office of the International and Economic Development Department for assistance or clarification with issues specifically related to the City's Small Business Economic Development Advocacy (SBEDA) Program policy and/or completion of the SBEDA form (s), if any. The point of contact is identified on the Cover Page. Contacting the Small Business Office regarding this RFO after the due date is not permitted. If this solicitation contains Affirmative Procurement Initiatives, it will be noted on the Cover Page.

If this solicitation contains DBE/ACDBE requirements, offeror and/or their agents may contact the Aviation Department's DBE/ACDBE Liaison Officer for assistance or clarification with issues specifically related to the DBE/ACDBE policy and/or completion of the required form(s). Point of contact is Ms. Barbara Patton, who may be reached via telephone at (210) 207-3592 or through e-mail at Barbara.Patton@sanantonio.gov. Offerors and/or their agents may contact Ms. Patton at any time prior to the due date for submission of offer. Contacting her or her office regarding this RFO after the offer due date is not permitted. If this solicitation contains DBE/ACDBE requirements, it will be noted on the Cover Page.

Pre-Submittal Conference.

If a Pre-Submittal Conference is scheduled, it will be held at the time and place noted on the Cover Page. Offerors are encouraged to prepare and submit their questions in writing in advance of the Pre-Submittal Conference in order to expedite the proceedings.

Pre-Submittal Conference participation is optional, but highly encouraged.

Respondents who join the WebEx Pre-Bid Conference are highly encouraged to email the solicitation's Staff Contact Person confirming Respondent attendance and participation through the WebEx.

Any oral response given at the Pre-Bid Conference that is not confirmed in writing and posted with this solicitation shall not be official or binding on the City.

To request an interpreter for the deaf or other assistance, call (210) 207-7245 Voice/TTY. Interpreters for the deaf must be requested at least 48 hours prior to the meeting.

Changes to RFO.

Changes to this RFO made prior to the offer due date shall be made directly to the original RFO. Changes are captured by creating a replacement version each time the RFO is changed. It is Offeror's responsibility to check for new versions until the offer due date. City will assume that all offers received are based on the final version of the RFO as it exists on the day offers are due.

No oral statement of any person shall modify or otherwise change or affect the terms, conditions or specifications stated in the RFO.

Preparation of Offers.

All information required by the RFO must be furnished or the offer may be deemed non-responsive and rejected. Any ambiguity in the offer as a result of omission, error, unintelligible or illegible wording shall be construed in the favor of City.

Correct Legal Name. If an Offeror is found to have incorrectly or incompletely stated the name of the entity that will provide goods and/or services, the offer may be rejected.

Line Item Offers. Any offer that is considered for award by each unit or line item must include a price for each unit or line item for which Offeror wishes to be considered. All offers are awarded on the basis of low line item, low total line items, or in any other combination that serves the best interest of City, unless City designates this solicitation as an "all or none" offer in the Supplemental Terms & Conditions.

All or None Offers. Any offer that is considered for award on an "all or none" basis must include a price for all units or line items. In an "All or None" offer, a unit price left blank shall result in the offer being deemed nonresponsive and disqualified from consideration. An "All or None" offer is one in which City will award the entire contract to one offeror only.

Delivery Dates. Proposed delivery dates must be shown in the offer form where required and shall include weekends and holidays, unless specified otherwise in this RFO. Proposed delivery times must be specific. Phrases such as "as required", "as soon as possible" or "prompt" may result in disqualification of the offer. Special delivery instructions, if any, may be found in the Specifications / Scope of Services section of this document, or in the Purchase Order.

Tax Exemption. The City of San Antonio is exempt from payment of federal taxes, and State of Texas limited sales excise and use taxes. Offerors must not include such taxes in offer prices. An exemption certificate will be signed by City where applicable upon request by Offeror after contract award.

Samples, Demonstrations and Pre-award Testing. If requested by City, Offeror shall provide product samples, demonstrations, and/or testing of items offered to ensure compliance with specifications prior to award of the contract. Samples, demonstrations and/or testing must be provided within 7 calendar days of City's request. Failure to comply with City's request may result in rejection of an offer. All samples (including return thereof), demonstrations, and/or testing shall be at Offeror's expense. Samples will be returned upon written request. Requests for return of samples must be made in writing at the time the samples are provided. Otherwise, samples will become property of City at no cost to City. Samples that are consumed or destroyed during demonstrations or testing will not be returned.

Estimated Quantities for Annual Contracts.

Designation as an "annual" contract is found in the contract's title on the Cover Page of this document. The quantities stated are estimates only and are in no way binding upon City. Estimated quantities are used for the purpose of evaluation. City may increase or decrease quantities as needed. Where a contract is awarded on a unit price basis, payment shall be based on the actual quantities supplied.

Offerors shall thoroughly examine the drawings, specifications, schedule(s), instructions and all other contract documents.

Offerors shall make all investigations necessary to thoroughly inform themselves regarding plant and facilities for delivery of material and equipment, or conditions and sites/locations for providing goods and services as required by this RFO. No plea of ignorance by Offeror will be accepted as a basis for varying the requirements of City or the compensation to Offeror.

Confidential or Proprietary Information. All offers become the property of City upon receipt and will not be returned. Any information deemed to be confidential by Offeror should be clearly noted; however, City cannot guarantee that it will not be compelled to disclose all or part of any public record under the Texas Public Information Act, since information deemed to be confidential by Offeror may not be considered confidential under Texas law, or pursuant to a Court order. Pricing may be tabulated and posted to City's website, so shall not be considered proprietary or confidential.

Costs of Preparation. Offeror shall bear any and all costs that are associated with the preparation of the Offer, attendance at the Pre-Submittal conference, if any, or during any phase of the selection process.

Rejection of Offers.

City may reject any and all offers, in whole or in part, cancel the RFO and reissue the solicitation. City may reject an offer if:

Offeror misstates or conceals any material fact in the offer; or

The offer does not strictly conform to law or the requirements of the offer;

The offer is conditional; or

Any other reason that would lead City to believe that the offer is non-responsive or Offeror is not responsible.

City, in its sole discretion, may also waive any minor informalities or irregularities in any offer, such as failure to submit sufficient offer copies, failure to submit literature or similar attachments, or business affiliation information.

Changes to Offer Form. Offers must be submitted on the forms furnished. Offers that change the format or content of City's RFO may be rejected.

Withdrawal of Offers. Offers may be withdrawn prior to the due date. Offers submitted electronically may be withdrawn electronically.

Evaluation and Award of Contract.

City reserves the right to make an award on the basis of City's best interests. Award may also be made based on low line item, low total line items, or in any other combination that serves the best interest of City, unless City designates this solicitation as an "all or none" offer in the Supplemental Terms & Conditions.

A written award of acceptance, manifested by a City Ordinance, and a purchase order furnished to Offeror results in a binding contract without further action by either party. Offeror must have the Purchase Order before making any delivery.

City reserves the right to delete items prior to the awarding of the contract, and purchase said items by other means.

Inspection of Facilities/Equipment. Depending on the nature of the RFO, Offerors' facilities and equipment may be a determining factor in making the offer award. All Offerors may be subject to inspection of their facilities and equipment.

Prompt Payment Discount.

Provided Offeror meets the requirements stated herein, City shall take Offeror's offered prompt payment discount into consideration. The evaluation will not be based on the discount percentage alone, but rather the net price as determined by applying the discount to the offer price, either per line item or total offer amount. However, City reserves the right to reject a discount if the percentage is too low to be of value to City, all things considered. City may also reject a discount if the percentage is so high as to create an overly large disparity between the price City would pay if it is able to take advantage of the discount and the price City would pay if it were unable to pay within the discount period. City may always reject the discount and pay within the 30 day period, at City's sole option.

City will not consider discounts that provide fewer than 10 days to pay in order to receive the discount.

For example, payment terms of 2% 5, Net 30 will NOT be considered in offer evaluations or in the payment of invoices. However, payment terms of 2% 10, Net 30 will result in a two percent reduction in the offer price during offer evaluation, and City will take the 2% discount if the invoice is paid within the 10 day time period.

Prohibited Financial Interest.
The Charter of the City of San Antonio and the City of San Antonio Code of Ethics prohibit a City officer or employee, as those terms are defined in the Code of Ethics, from having a direct or indirect financial interest in any contract with City. An officer or employee has a "prohibited financial interest" in a contract with City or in the sale to City of land materials, supplies or service, if any of the following individual(s) or entities is a party to the contract or sale:

- A City officer or employee; his or her spouse, sibling, parent, child, or other family member within the first degree of consanguinity or affinity;
- An entity in which the officer or employee, or his or her parent, child or spouse directly or indirectly owns (i) 10% or more of the voting stock or shares of the entity, or 10% or more of the fair market value of the entity; or
- An entity in which any individual or entity listed above is (i) a subcontractor on a City contract, (ii) a partner or (iii) a parent or subsidiary entity.

By submitting a proposal, Respondent warrants and certifies, and a contract awarded pursuant to this RFO is made in reliance thereon, that it, its officers, employees and agents are neither officers nor employees of the City.

State of Texas Conflict of Interest:

Questionnaire (Form CIQ). Chapter 176 of the Texas Local Government Code requires that persons, or their agents, who seek to contract for the sale or purchase of property, goods, or services with the City, shall file a completed Form CIQ with the City Clerk if those persons meet the requirements under 176.006(a) of the statute.

By law this questionnaire must be filed with the City Clerk not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Texas Local Government Code.

Form CIQ is available from the Texas Ethics Commission by accessing the following web address:

https://ethics.state.tx.us/forms/conflict/

In addition, please complete the **City's Addendum to Form CIQ (Form CIQ-A)** and submit it with Form CIQ to the Office of the City Clerk. The Form CIQ-A can be found at:

http://www.sanantonio.gov/atty/ethics/pdf/OCC-CIQ-Addendum.pdf

When completed, the CIQ Form and the CIQ-A Form should be submitted together by mail to the Office of the City Clerk. Please mail to:

Office of the City Clerk, P.O. Box 839966, San Antonio, TX 78283-3966.

Do not include these forms with your offer. The Purchasing Division will not deliver the forms to the City Clerk for you.

CERTIFICATE OF INTERESTED PARTIES (FORM 1295)

The Texas Government Code §2252.908, and the rules issued by the Texas Ethics Commission found in Title 1, Chapter 46 of the Texas Administrative Code, require a business entity to submit a completed Form 1295 to the City before the City may enter into a contract with that business entity.

Form 1295 must be completed online. It is available from the Texas Ethics Commission by accessing the following web address:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

Print and sign your completed Form 1295. Submit your signed Form 1295 with your response to this solicitation. Where requested to provide the name of the public entity with whom you are contracting, insert "City of San Antonio". Where requested to provide the contract number, provide the solicitation number shown on the cover page of this solicitation (e.g. IFB 6100001234, RFO 6100001234 or RFCSP 6100001234).

The following definitions found in the statute and Texas Ethics Commission rules may be helpful in completing Form 1295.

"Business entity" includes an entity through which business is conducted with a governmental entity or state agency, regardless of whether the entity is a for-profit or nonprofit entity. The term does not include a governmental entity or state agency. (NOTE: The City of San Antonio should never be listed as the "Business entity".)

"Controlling interest" means: (1) an ownership interest or participating interest in a business entity by virtue of units, percentage, shares, stock, or otherwise that exceeds 10 percent; (2) membership on the board of directors or other governing body of a business entity of which the board or other governing body is composed of not more than 10 members; or (3) service as an officer of a business entity that has four or fewer officers, or service as one of the four officers most highly compensated by a business entity that has more than four officers. Subsection (3) of this section does not apply to an officer of a publicly held business entity or its wholly owned subsidiaries.

"Interested party" means: (1) a person who has a controlling interest in a business entity with whom a governmental entity or state agency contracts; or (2) an intermediary.

"Intermediary," for purposes of this rule, means a person who actively participates in the facilitation of the contract or negotiating the contract, including a broker, adviser, attorney, or representative of or agent for the business entity who:

(1) receives compensation from the business entity for the person's participation;

(2) communicates directly with the governmental entity or state agency on behalf of the business entity regarding the contract; and

(3) is not an employee of the business entity or of an entity with a controlling interest in the business entity.

Publicly traded business entities, including their wholly owned subsidiaries, are exempt from this requirement and are not required to submit Form 1295.

004 - SPECIFICATIONS / SCOPE OF SERVICES

4.1 **BACKGROUND:** The City of San Antonio is soliciting an offer from Siddons Martin Emergency Group, LLC, to furnish one Pierce Velocity® Platform Ladder Truck with equipment. Truck provided shall be the current model year chassis or newer.

4.2 **GENERAL CONDITIONS:** The following general conditions shall apply to all items within this bid unless specifically excluded within any item.

4.2.1 City of San Antonio reserves the right to increase or decrease quantity of units being purchased up to the production "cut-off" date submitted on the bid for the particular item, depending on availability of funds. Prices may not be increased during this period; however, the City should benefit from any price decrease. Additional units may be purchased on an "as needed" basis. Successful vendor is required to notify the City of all production "cut-off" dates necessary for order submission. Vehicles are to be year model 2023 or newer.

4.2.2 All components shall be installed new, unused, standard production model, and equipment must be serviced in accordance with manufacturer's recommended pre-delivery check list, and ready for operation upon delivery, and shall include all manufacturers' standard equipment unless otherwise specified or replaced therein. Equipment offered under the below listed specifications will be considered unacceptable if for any reason its long term availability on the U.S. Market or in the local area is in doubt.

4.3 **WARRANTY**: All items bid shall include the standard manufacturer's warranty, including both parts and labor, for all components and attachments. All warranties must be for a minimum period of twelve months. The warranty shall begin on the date the vehicle is placed in service, not on the delivery date. **Vendor shall attach a copy of the manufacturer's warranty to Vendor's bid.** City will notify Vendor by letter of the in-service date for each item by serial number. Warranty service and parts must be available within a 50 mile radius of San Antonio City Hall from a factory authorized dealer. Included warranties are as follows:

4.3.1 ONE (1) YEAR MATERIAL AND WORKMANSHIP ON APPARATUS
4.3.2 THREE (3) YEAR MATERIAL AND WORKMANSHIP ON CHASSIS
4.3.3 FIVE (5) YEAR LIMITED ENGINE WARRANTY (Paccar)
4.3.4 THREE (3) YEAR STEERING GEAR WARRANTY (Sheppard)
4.3.5 FIFTY (50) YEAR STRUCTURAL INTEGRITY ON FRAME AND CROSS MEMEMBERS (WA0038)
4.3.6 FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY (WA0050)
4.3.7 REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY (WA0046)
4.3.8 ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY (WA0232)
4.3.9 TEN (10) YEAR CUSTOM CAB LIMITED STRUCTURAL INTEGRITY (WA0012)
4.3.10 TEN (10) YEAR PRO-RATED PAINT AND CORROSION (WA0055)
4.3.11 FIVE (5) YEAR MATERIAL AND WORKMANSHIP COMMAND ZONE ELECTRONICS LIMITED WARRANTY CERTIFICATE (WA0014)
4.3.12 FIFTY-FOUR MONTH WARRANTY CAMERA SYSTEM WARRANTY
4.3.13 COMPARTMENT LIGHT WARRANTY (WA0203)
4.3.14 FIVE (5) YEAR/UNLIMITED TRANSMISSION WARRANTY EXCLUDING TRANSMISSION COOLER - five (5) year/unlimited mileage warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.
4.3.15 TRANSMISSION COOLER - The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). Collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed $10,000 per occurrence.
4.3.16 TEN (10) YEAR STRUCTURAL INTEGRITY ON APPARATUS BODY (WA0009)
4.3.17 ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY
4.3.18 A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. (WA0185)
4.3.19 TEN (10) YEAR PUMP PLUMBING WARRANTY (WA0035)

4.3.20 A six (6) year limited warranty will be provided on painted and satin roll up doors.
4.3.21 TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY (WA0052)
4.3.22 FIVE (5) YEAR AERIAL SWIVEL LIMITED WARRANTY
4.3.23 FIVE (5) YEAR HYDRAULIC SYSTEM COMPONENTS WARRANTY
4.3.24 THREE (3) YEAR HYDRAULIC SEAL WARRANTY
4.3.25 TEN (10) YEAR AERIAL WATERWAY LIMITED WARRANTY
4.3.26 FOUR (4) YEAR PRO-RATED PAINT AND CORROSION ON AERIAL DEVICE (WA0047)
4.3.27 FIVE (5) YE COMMAND ZONE ELECTRONIC WARRANTY (WA0014)
4.3.28 SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY(WA0285)AR
4.3.29 TEN (10) YEAR PRO-RATED PAINT AND CORROSION ON TRUCK BODY (WA0057)
4.3.30 ONE (1) YEAR MATERIAL AND WORKMANSHIP ON GRAPHICS FADING AND DETERIORATION (WA0168).

4.4 **DELIVERY:** The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. All deliveries are to be made inside the City limits of San Antonio. Vendor must deliver equipment to a location specified by the Fleet Acquisitions Dept. at (210) 207-4603 or (210) 207-4601. **Delivery to a non-specified location will result in non-acceptance of the equipment by the City. All deliveries must be pre-arranged with a minimum 24-hour notification, NO EXCEPTIONS. Vehicles will not be accepted after 3:00 P.M. CST. All vehicles are required to have a full tank(s) of fuel when delivered to City specified location.**

4.5 **EQUIPMENT MANUALS:** Two thumb drive with operator's manuals will be provided per purchase order, which shall include a parts and maintenance manuals as well as construction drawings complete with wiring diagrams.

4.6 **REQUIRED DOCUMENTS AT DELIVERY:** The Manufacturer's Statement of Origin (MSO), Dealer Temporary license plates/tags, proper Invoice, signed 130U form, Vehicle Inspection Report, and State Weight Certificate/slip (for trucks over one ton) are required upon delivery of each unit and are required before payment can be processed. Any of these missing items will delay the payment process.

4.7 **MINIMUM VEHICLE ACCESSORIES:** All units must be equipped at the factory with maximum capacity cooling system offered by manufacturer, full headliner, fresh air heater and defroster units, minimum AM/FM OEM radio, power windows and power door locks and manual tilt steering wheel. Each unit shall have a minimum three keys. All accessories and equipment will be OEM. The manufacturer will rate all equipment provided as low emission on all models available. Vehicles must be equipped with OEM tinted glass.

4.8 **INCOMPLETE VEHICLES:** All bodies and components in this bid will be installed in accordance with the appropriate Incomplete Vehicle Data Manual. Certification of compliance will be posted on the left door post of the vehicle. Except for manufacturer's data plates (maximum 4" x 6"), vendor's or manufacturer's identifying markings (decals and plates) will not be applied to the vehicle or mounted components. Installation will be completed in compliance with Federal Motor Vehicle Department of Transportation Standards and Texas State Highway requirements. Installation of body and accessories on City furnished vehicles will be accomplished by drilling holes in the frame. Welding on or cutting of frame is not authorized forward of the rear spring hanger or support. Bidders will be responsible for the relocation of any truck components to facilitate installation of the body and equipment. Such relocation must be included as part of the basic bid.

4.9 **BUILD SHEET INSTRUCTIONS:** Upon contract award, vendor shall provide written acknowledgement of order placement. A copy of the finalized build sheet with a San Antonio Fire Department Representative signature confirming equipment build out shall be provided to the City prior to equipment delivery. The delivery date for the completed unit shall be communicated when the build sheet is finalized. Electrical wiring schematics that include lighting and air conditioning systems for body shall be provided at time of delivery. Electrical wiring schematics and finalized build sheet shall be provided in paper in Adobe PDF format.

4.10 **VEHICLE INSPECTION:** The vendor shall have each vehicle (except cab and chassis units delivered without bodies) properly inspected in compliance with Texas motor vehicle laws.

4.11 **CHECK-IN INSPECTION:** The City shall check the vehicle upon delivery to ensure compliance with this specification and any other specific requirements. The vendor shall deliver with the vehicle a manufacturer's invoice, and MSO or any official documentation to verify the fact that ordered options, GVWR rating, and other requirements have been met. Failure to provide required documentation as listed may cause the delay of payment. Payment will be made within 30 days after vehicle's acceptance or receipt of correct invoice, whichever is later. Acceptance will not be made, nor payment initiated on vehicles failing to meet specifications (unless they are brought into full compliance), and all necessary documents (i.e. MSO, odometer statement, etc.) are received by the City.

The City shall have a maximum of 20 working days to complete this inspection.

4.12 **NON COMPLIANT VEHICLES:** Vendor shall remove noncompliant vehicle(s) from City premises within 5 working days after receiving written notification from Fleet Acquisition staff. If vehicle is not removed by vendor within the specified time frame, the City may arrange for vehicle to be removed and secured by a local towing and storage facility. Vendor will be responsible for payment of all related towing and storage charges. The City will not be responsible or liable for damage or loss of noncompliant vehicles which remain on City premises, or which are removed by towing company, 5 working days after vendor notification.

4.13 **ELECTRICAL:** Heavy duty battery and alternator offered by manufacturer for models being bid. All units must be equipped with oil pressure, water temperature, and volt or amp gauges.

4.14 **No dealership nameplates, markings or decals will be permitted on the vehicles.**

4.15 **BRAND NAMES:** Manufacturer names, trade names, brand names, and product numbers used herein are for the purpose of describing and establishing tested, compatible, approved and acceptable products that are of the type and quality required by the City.

4.16 **INFORMATION:** a permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

4.17 **SAFETY VIDEO:** At the time of delivery bidder will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, aerial operation, and safety during maintenance.

4.18 **PERFORMANCE TESTS:** A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus will meet NFPA 1901 acceleration requirements and NFPA 1901 braking requirements. The apparatus when fully loaded will not have less than 25 percent or more than 50 percent on the front axle and not less than 50 percent or more than 75 percent on the rear axle.

4.19 **NFPA 2016 STANDARDS:** Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract award. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".

4.19.1 All vehicles this unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the statement of exceptions.

4.19.2 To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

4.20 **MARKINGS:** All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the City approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

4.20.1 A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

4.20.2 A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

4.21 **INSPECTION CERTIFICATE:** a third party inspection certificate for the aerial device will be furnished upon delivery of the aerial device. The certificate will be underwriters laboratories inc. Type 1 and will indicate that the aerial device has been inspected on the production line and after final assembly.

4.21.1 Visual structural inspections will be performed on all welds on both aluminum and steel ladders.

4.21.2 On critical weld areas, or on any suspected defective area, the following tests will be conducted:

a. Magnetic particle inspection will be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets will be placed on each side of the weld while iron powder is placed on the weld itself. The powder will detect any crack that may exist. This test will conform to ASTM E709 and be performed prior to assembly of the aerial device.

b. A liquid penetrant test will be conducted on aluminum aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. This test will conform to ASTM E165 and be performed prior to assembly of the aerial device.

c. Ultrasonic inspection will conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components.

4.21.3 In addition to the tests above, functional tests, load tests, and stability tests will be performed on all aerials. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the unit.

4.22 **SINGLE SOURCE MANUFACTURER**: The manufacturer shall provide an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. The chassis, cab weldment, cab, pump house (including the sheet metal enclosure, valve controls, piping and operator's panel) body and aerial device will be entirely designed, tested, and hand assembled to the City's exact specifications in the manufacturer's facility. The electrical system shall be designed and integrated by manufacturer. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by manufacturer as a single source manufacturer.

4.23 **BREATHING AIR TEST**: if the unit has breathing air, bidder will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *standard on breathing air quality for fire and emergency services respiratory protection.*

4.24 **INSPECTION TRIP(S):** the bidder will provide three (3) factory inspection trip(s) for preconstruction mid-point and final inspection City representative(s). The inspection trip(s) will be scheduled at times mutually agreed upon between the manufacturer's representative and the City. All costs, such as travel and lodging, will be the responsibility of the bidder.

4.25 **PRODUCT CHANGES AND IMPROVEMENTS**: Components and processes described in the proposal document shall be as accurate as known at the time of bid submission, but may subject to change for the purpose of product

or process improvements, or changes in industry standards provided the change does not affect the meaning or definition of the bid specifications.

4.26 **AFTERMARKET SUPPORT WEBSITE:** Bidder will provide authorized access to comprehensive information pertaining to the maintenance and service of the City's apparatus. This tool will provide the ability to service and support City to the best of their ability with factory support at their fingertips.

4.27 **APPROVAL DRAWING:** A drawing of the proposed apparatus will be prepared and provided to the City for approval before construction begins. The sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

Any "revised" approval drawing of the apparatus will be prepared and submitted by bidder to the City showing any changes made to the approval drawing.

4.28 **ELECTRICAL WIRING DIAGRAMS:** One (1) USB drive copy and one (1) paper copy of the electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

4.29

ITEM	Quantity	Description
1	1	Pierce Velocity Platform Ladder

4.30 **VELOCITY CHASSIS**- Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

4.31 **WHEELBASE** – Minimum 268"

4.32 **GVW RATING** – Minimum 80,800 lbs.

4.33 **FRAME** - The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

4.34 **FRAME REINFORCEMENT** - A mainframe inverted "I" liner will be provided. It will be heat-treated steel measuring 12.00" x 3.00" x 0.25". Each liner will have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,861 in-lb.

4.34.1 The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

4.35 **FRONT NON-DRIVE AXLE** - The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

4.35.1 Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

4.35.2 The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

4.35.3 Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life.

4.35.4 Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

4.35.5 There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

4.35.6 The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

4.35.7 Camber at load will be 0 degrees for optimum tire life.

4.35.8 The ball joint bearing will be of low friction design and be maintenance free.

4.35.9 Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

4.35.10 The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

4.35.11 The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

4.35.12 The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

4.36 FRONT SUSPENSION - Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

4.36.1 The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

4.36.2 Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

4.36.3 The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

4.36.4 The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

4.36.5 The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

4.37 FRONT SHOCK ABSORBERS - KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

4.38 FRONT OIL SEALS - oil seals with viewing window will be provided on the front axle.

4.39 FRONT TIRES -front tires will be Michelin 425/65R22.50 radials, 20 ply XZE wide base tread, rated for 22,800 lb maximum axle load and 65 mph maximum speed. The tires will be mounted on Accuride brand 22.50" x 12.25" steel disc type wheels with a ten (10)-stud, 11.25" bolt circle.

4.40 REAR AXLE - The rear axle will be a Meritor™, Model RT-58-185, tandem axle assembly with a capacity of 58,000 lb. An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.

4.41 TOP SPEED OF VEHICLE - A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 60 mph.

4.42 REAR SUSPENSION - The rear suspension will be Ridewell Dynalastic model 202S with a ground rating of 58,000 lb. The suspension will have the following features:

4.42.1 Individually articulating torque beams pivoted to a compensator providing independent axle movement and steady load distribution

4.42.2 Utilizes Ultra Torque Rod Plus torque

4.43 REAR OIL SEALS - Oil seals will be provided on the rear axle(s).

4.44 REAR TIRES - Rear tires shall be eight (8) Michelin 315/80R22.50 radials, load range L, X® WORKS™ Z, rated for 66,160 lb. maximum axle load and 65 mph maximum speed. The tires will be mounted on Accuride brand 22.50" x 9.00" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.

4.45 TIRE BALANCE - All tires will be balanced with wheel weights or add on balancer mounted behind the wheel.

4.46 MUD FLAPS - Mud flaps with logo will be installed behind the front and rear wheels. One full width mud flap will also be installed across the rear of the truck just in front of the bumper.

4.47 WHEEL CHOCKS - There will be one (1) pair of Worden Safety Products, Model HWGY-SB, wheel chocks provided. Heavy Duty, large molded aluminum wheel chock yellow powder coat finish

4.48 WHEEL CHOCK BRACKETS - There will be one (1) pair of Worden Safety model U815T mounting wheel chock brackets provided. The brackets will be mounted in front of the DS rear wheels.

4.49 ELECTRONIC STABILITY CONTROL - A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

4.49.1 The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

4.49.2 The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

4.50 ANTI-LOCK BRAKE SYSTEM - The vehicle will be equipped with a Wabco 6S6M, anti-lock braking system. The ABS will provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

4.51 AUTOMATIC TRACTION CONTROL - An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. A "mud/snow" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

4.52 BRAKES- The service brake system will be full air type. The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance. The brake system will be certified, third party inspected, for improved stopping distance. The rear brakes will be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters. Dust shields will be provided.

4.53 AIR COMPRESSOR, BRAKE SYSTEM – The air compressor will be a Wabco single piston compressor with a 26.8 CI displacement.

4.54 BRAKE SYSTEM - The brake system will include:

4.54.1 Bendix dual brake treadle valve with vinyl covered foot surface.

4.54.2 Heated automatic moisture ejector on air dryer.

4.54.3 Total air system capacity of 8,108 cubic inches.

4.54.4 Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi.

4.54.5 Spring set parking brake system.

4.54.6 Parking brake operated by a push-pull style control valve.

4.54.7 A parking "brake on" indicator light on instrument panel.

4.54.8 Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi.

4.54.9 A pressure protection valve will be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).

4.54.10 1/4 turn drain valves on each air tank.

4.54.11 The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

4.54.12 To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

4.55 BRAKE SYSTEM AIR DRYER - The air dryer will be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100 watt heater.

4.56 BRAKE LINES - Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

4.57 AIR INLET/OUTLET - One (1) air inlet/outlet will be installed with the female coupling located in the driver side lower step well of cab. This system will tie into the "wet" tank of the brake system and include a check valve in the inlet line and an 85 psi pressure protection valve in the outlet line. The air outlet will be controlled by a needle valve.

4.57.1 A mating male fitting will be provided with the loose equipment.

4.57.2 The air inlet will allow a shoreline air hose to be connected to the vehicle. This will allow station air to be supplied to the brake system of the vehicle to insure constant air pressure.

4.58 ALL WHEEL LOCK-UP - An additional all wheel lock-up system will be installed which applies air to the front brakes only. The standard spring brake control valve system will be used for the rear. The all wheel lock-up system will be activated automatically when the aerial master switch is activated.

4.59 **REMOTE AIR TANK DRAIN**- There will be a remote mounted 1/4 turn drain valve installed on each air supply reservoir. The drain valve will be actuated from the underside of the driver side body corner. .375" air line will be provided between each drain valve and the reservoirs. The drains will be mounted at the lowest point on the bottom of the tank for maximum drainage.

4.60 **COMPRESSION FITTINGS ONLY** - Any nylon tube on the apparatus that is pneumatic will be plumbed with compression type fittings where applicable. Push lock fittings will not be acceptable for any pneumatic nylon tube plumbing.

4.61 **AIR COMPRESSOR, BRAKE SYSTEM MAINTENANCE** - a Kussmaul, model 091-9b-1 air compressor will be provided. It will be driven by the 120 volt shoreline electrical system and will be located driver side rear facing seat riser, must be wired to a receptacle, not hard wired. Needs to be removable from the front access panel. Provide knockouts on the panel not louvers and foam gasket.

4.61.1 The compressor will maintain the air pressure in the chassis air brake system while the vehicle is not in use.

4.61.2 A pressure switch will sense when the system pressure drops and automatically start the compressor, which then will run until pressure is restored.

4.62 **ENGINE** - The chassis will be powered by an electronically controlled diesel engine Paccar MX13, 510 hp at 1600 rpm, Torque - 1850 lb-ft at 1000 rpm, 6 cylinder, 12.9L; with a DP60 starter. The engine will include On-board diagnostics (OBD), which provides self- diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

4.63 **HIGH IDLE** - A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation override. The high idle will be operational only when the parking brake is on, the truck transmission is in neutral. A green indicator light will be provided adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle". The high idle circuit will be programmed to allow high idle with the parking brake applied, transmission in neutral and pump in gear. When the truck transmission is shifted into gear with the high idle on, the high idle will drop out for a safe shift condition.

4.64 **ENGINE BRAKE** - The compression release brake option is a fully integrated mx engine braking system. It utilizes the turbocharger and backpressure valve, adds in a hydraulically operated compression brake to increase overall retarding power. To maximize the effectiveness of the compression brake the MX engine brake system works in conjunction with the turbocharger and back pressure valve. The driver will be able to turn the engine brake system on/off and have a high, medium and low setting

4.64.1 The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

4.64.2 The ABS system will automatically disengage the auxiliary braking device, when required.

4.65 **CLUTCH FAN** - A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.

4.66 **ENGINE AIR INTAKE** - An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

4.67 EXHAUST SYSTEM - The exhaust system will include a Single Module™ aftertreatment device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the aftertreatment device, and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

4.68 RADIATOR - The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

4.68.1 For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

4.68.2 There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

4.68.3 The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

4.68.4 A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

4.68.5 A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

4.69 COOLANT LINES - Gates® silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

4.69.1 The chassis manufacturer will also use Gates brand hose on other heater, defroster and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances, a comparable silicone hose from another manufacturer will be used.

4.69.2 Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

4.70 FUEL TANK - A 75 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

4.70.1 A .75" drain plug will be provided in a low point of the tank for drainage.

4.70.2 A fill inlet will be located on the left hand and right hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

4.70.3 A .50" diameter vent will be provided running from top of tank to just below fuel fill inlet.

4.70.4 The tank will meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume.

4.70.5 All fuel lines will be of the wire braided type. Reusable fittings will be provided.

4.71 DIESEL EXHAUST FLUID TANK - A 6 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body.

4.71.1 A 0.50" drain plug will be provided in a low point of the tank for drainage.

4.71.2 A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located below the air bottle storage behind a common door on the driver side of the vehicle.

4.71.3 The tank will meet the engine manufacturer's requirement for 10 percent expansion space in the event of tank freezing.

4.71.4 The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

4.72 **TRANSMISSION** -An Allison 5th generation, Model EVS 4500P, electronic, torque converting, automatic transmission with retarder will be provided. The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

4.72.1 Two (2) PTO openings will be located on left side and top of converter housing (positions eight (8) o'clock and one (1) o'clock).

4.72.2 A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

4.73 **TRANSMISSION SHIFTER** - A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation. The transmission ratio will be: 1st - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, 6th - 0.67 to 1.00, R - 5.55 to 1.00.

4.74 **TRANSMISSION COOLER** -An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code. An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

4.75 **GREASE SHIELD** - The drive shaft slip joint requires a grease shield to prevent grease from being thrown against the frame wiring harness.

4.76 **PAINT PUMP TRANSMISSION AND DRIVE TRANSMISSION OUTPUT YOKES** - The pump transmission and drive transmission output yokes will be brush painted the same color as the driveshafts. The yokes will be brush painted, not spray painted. Paint color is job color.

4.77 **STEERING** - Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

4.77.1 A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

4.77.2 Standard steering gear oil must be replaced with 15W40 CJ-4 motor oil.

4.78 **STEERING WHEEL** - The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

4.79 **LOGO AND CITY DESIGNATION ON DASH** - The dash panel will have an emblem containing the manufacturer logo and City name. The emblem will have three (3) rows of text for the City's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

4.79.1 The first row of text will be: San Antonio

4.79.2 The second row of text will be: Fire

4.79.3 The third row of text will be: Department

4.80 TAG/LABEL - The following one (1) tags or labels will be provided DS in nose cone on the chassis or cab. The tag/label will be configured and read "STEERING FLUID 15W40 CJ-4 OIL MOTOR OIL."

4.81 BUMPER - A one (1)-piece, 0.25" thick steel channel bumper, a minimum 12.00" high will be attached to the front of the chassis frame. The bumper will be painted job color. A 9.00" formed steel channel will be mounted directly behind bumper for additional strength. The bumper will be extended 10.00" from front face of cab.

4.82 GRAVEL PAN - A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

4.83 LIFT AND TOW MOUNTS WITH TOW EYES - Mounted to the frame extension will be lift and tow mounts. Incorporated in the mounts will be two (2) painted steel tow eyes. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems. The tow eyes will not be used for lifting of the apparatus. The inner and outer edges of the tow eyes will have a 0.25" radius. The lift and tow mounts with eyes will be painted orange.

4.84 TOW EYES - Two (2) cutouts will be provided in the front face of the bumper to allow two (2) Chicago style tow eyes to extend out the front. The inner and outer edges of the utility eyes will have a 0.25 radius. The tow eyes will be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus. The utility eyes will be painted chassis frame color.

4.85 CAB - The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing. To provide quality at the source and single source City support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

4.85.1 For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

4.85.2 The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

4.85.3 The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

4.85.4 The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

4.85.5 The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

4.85.6 The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

4.85.7 The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

4.85.8 The raised roof section of the crew cab will have a 58.00" wide x 10.00" high square notch in the center section of the roof. This will allow the aerial device to be bedded in the same location as a non-raised roof.

4.85.9 The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

4.85.10 To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 52.95" in the center position and 68.75" in the outboard positions.

4.85.11 The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

4.86 **INTERIOR CAB INSULATION** - The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

4.87 **FENDER LINERS** - Full-circular, aluminum inner fender liners in the wheel wells will be provided.

4.88 **PANORAMIC WINDSHIELD** - A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" 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. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

4.89 **WINDSHIELD WIPERS** - Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather. The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

4.90 **FAST SERVICE ACCESS FRONT TILT HOOD** - A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the logo.

The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

4.91 **ENGINE TUNNEL** - To provide structural strength, the engine tunnel sidewalls will be constructed of 0.50" aluminum plate that is welded to both the 0.25" firewall and 0.38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

4.91.1 The back of the engine tunnel will be no higher than 16.25" off the crew cab floor.

4.91.2 The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

4.92 **CAB REAR WALL EXTERIOR COVERING** - The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

4.93 **CAB LIFT** - A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

4.93.1 The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

4.93.2 The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

4.93.3 The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

4.93.4 For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

4.94 **CAB LIFT INTERLOCK** - The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

4.95 **GRILLE** - A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

4.96 **SCUFFPLATE** - A treadplate scuffplate will be installed on the top edge of both rear facing seat risers. The scuffplate will be flanged to the front to protect the painted edge of the seat riser.

4.97 **FRONT CAB TRIM** - Bright finished wrap-around housings will be provided on each side of the front cab face for mounting of the headlights and front directional lights. The housings will mate up to the side edge of the forward grille, and then extend around the front corners of the cab rearward, providing for a streamlined automotive appearance.

4.98 **MIRRORS** - Ramco, Model 6001FFHR-750HR, polished aluminum 9.25" wide x 13.50" high mirrors, with full flat glass section, will be mounted on each side of the front cab corner. A convex section will be bolted to the top of each mirror.

4.98.1 The flat glass in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

4.98.2 The convex section in each mirror will be heated and adjustable with remote controls.

4.99 MIRROR (SIDE VIEW) - Exterior officer's side view mirror will be provided on the cab. Mirror will allow passenger to view the side cab blind spot and the area to the rear of the truck. Mirror will be located on the cab door, mounted on an adjustable arm. Mirror head will be an 8.00" convex mirror.

4.100 FRONT CROSS VIEW MIRROR - There will be one (1) 8.00" diameter eyeball mirror provided on the passenger side front corner of the cab. It will be mounted high, above the windshield. The mirror will provide the driver with a view of the front bumper and the front of the truck. The mirror housing, tubing, clamps and hardware will be constructed of corrosion resistant stainless steel.

4.100.1 Mirror head will be K-10, EB50S-S, 8.00" stainless steel housing with three (3) arms.

4.100.2 A 4.00" riser will be provided between the mirror body and support arm on passenger side only.

4.101 CAB DOORS - The forward cab and crew cab doors will be the half-height style door. To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 64.71" high. The crew cab doors will measure a minimum of 37.87" wide x 73.75" high.

4.101.1 The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

4.101.2 The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

4.101.3 A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

4.101.4 The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

4.101.5 A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

4.101.6 A chrome grab handle will be provided on the inside of each cab and crew cab door.

4.101.7 The cab steps at each cab door location will be located below the cab doors and will be exposed to the exterior of the cab.

4.102 CAB DOOR PANELS - The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

4.103 RECESSED POCKET WITH ELASTIC COVER - To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with a recessed storage pocket. The pocket will be 5.63" wide x 2.00" high x 6.00" deep. The pocket will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pocket will be installed in location 7 on the driver side console.

4.104 ELECTRIC WINDOW CONTROLS - Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch

for each cab door's window. All other door control panels will contain a single switch to operate the window within that door. The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

4.105 ELECTRIC CAB DOOR LOCKS - The front driver and passenger doors will have a door lock master switch (custom designed rotary lock knob) built into the interior door latch that will control all front and rear side exit door locks. Each rear cab door will have its own lock control. Each door will have a keyed exterior lock mechanism built into the door handle assembly.

4.105.1 There will be one (1) concealed switch on the exterior of the cab, located under the front full width service access panel, that operates the cab door locks.

4.105.2 The lock system will include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system will use code hopping technology for high security and be FCC part 15 compliant.

4.106 DUAL STEPS - A dual step will be provided below each cab and crew cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 24.00" wide x 7.00" deep stepping surface. The step design raises the middle step higher and closer to the cab floor, resulting in a 12.00" distance from the step to cab floor in the cab and a 13.50" distance from the step to cab floor in the crew cab. Stepping distances from the ground to first step will be 16.50" and from first step to middle step will be 12.00".

4.106.1 The first step will be lit by a white 12 volt DC LED light provided on the step.

4.107 STEP LIGHTS - For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

4.107.1 In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

4.107.2 The lights will be activated when the adjacent door is opened.

4.108 FENDER CROWNS - Rubber fender crowns will be provided around the cab wheel openings. Crowns will be black.

4.109 CREW CAB WINDOWS - One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

4.110 WINDOWS INTERIOR TRIM - For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

4.111 STORAGE COMPARTMENT - Provided under the forward facing crew cab seats will be a transverse compartment.

4.111.1 The compartment will be open top to bottom. There will be no dividers. The upper section will be 9.50" wide x 13.12" high x 26.25" deep (driver side) and 24.00" deep (passenger side). The top 7.38" of the upper compartment will be full width (transverse) of the crew cab. The lower section on both sides will be 9.50" wide x 16.50" high x 22.00" deep. The compartment will extend from the bottom of the cab to top of the seat riser.

4.111.2 There will be an access door on both sides of the cab with double pan doors.

4.111.3 Doors will be latched with recessed, polished stainless steel D-ring handles and Eberhard 106 locks. The doors will include gas shock style positive door holders. A magnetic style switch will be provided to activate the door open warning system.

4.111.4 There will be one (1) drop down door, single pan construction, on the forward face of the seat riser.

4.111.5 The drop down door will include two (2) flush quarter turn latches.

4.111.6 The cab side access doors will be painted to match the cab exterior and the drop down door inside the cab will be constructed of polished stainless steel.

4.111.7 The compartment interior will be splatter paint color.

4.111.8 Compartment Light - There shall be four (4) white LED strip lights, one (1) each left side of lower and upper exterior compartment door opening. The lights shall be controlled by an automatic door switch.

4.112 CAB INSULATION - The underside of the cab and crew cab floor will be sprayed with insulation. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards. This will include the crew cab area of the truck.

4.113 MOUNTING PLATE ON ENGINE TUNNEL - Equipment installation provisions will be installed on the engine tunnel. A .188" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will extend from behind the instrument panel console, down the taper in the tunnel and terminate at the rear of the storage compartment mounted to the rear of the engine tunnel. The rear horizontal surface of the tunnel will not be covered. The front of the plate will be flanged 45 degrees downward to prevent items from rolling underneath it. The front horizontal surface will be 10.00" from the front flange to the taper down the engine tunnel. This front surface will not follow the profile of the engine tunnel. The plate will be spaced off the engine tunnel .75" to allow for wire routing below the plate. The mounting surface will be painted to match the cab interior.

4.114 CAB INTERIOR - With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road. Interior Cab shall be equipped with the following:

4.114.1 The center console will be a high impact ABS polymer and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield.

4.114.2 The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

4.114.3 To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

4.114.4 To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

4.114.5 To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

4.114.6 The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

4.114.7 The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

4.115 CAB INTERIOR UPHOLSTERY - The cab interior upholstery will be dark silver gray. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

4.116 CAB INTERIOR PAINT - A rich looking interior will be provided by painting all the metal surfaces inside the cab fire smoke gray, vinyl texture paint.

4.117 CAB FLOOR - The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler. The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

4.118 CAB DEFROSTER - To A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

4.118.1 One (1) Adjustable will be directed towards the left side cab window

4.118.2 One (1) Adjustable will be directed towards the right side cab window

4.118.3 Six (6) fixed outlets will be directed at the windshield

4.118.4 The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

4.119 AIR CONDITIONING - Due to the large space inside the cab, a high-performance, customized air conditioning system will be furnished. A 19.10 cubic inch compressor will be installed on the engine. Air Conditioning shall be equipped with the following:

4.119.1 The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

4.119.2 A roof-mounted condenser with a 78,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs to be painted white as provided by manufacturer.

4.119.3 The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

4.119.4 The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

4.119.5 Adjustable air outlets will be strategically located on the evaporator cover per the following:

A. Four (4) will be directed towards the driver's location

B. Four (4) will be directed towards the officer's location

C. Eight (5) will be directed towards crew cab area

D. The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

4.119.6 The air conditioner will be controlled by an automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.

4.120 INTERIOR CAB INSULATION - The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a 0.20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control.

4.120.1 Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide and R-value of 4 per 1.00" thickness.

4.121 CONDENSATION DRAIN TUBES - Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan.

4.122 SUN VISORS - Two (2) dark Lexan™ sun visors provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab. There will be black plastic retention bracket provided to help secure each sun visor in the stowed position.

4.123 GRAB HANDLE - A black rubber covered grab handle will be mounted on the door post of the driver side cab and passenger door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield. A long rubber grab handle will be mounted on the dash board in front of the officer.

4.124 ENGINE COMPARTMENT LIGHTS - There will be one (1) Whelen, Model 3SC0CDCR, 12 volt DC, 3.00" white LED light(s) with Whelen, Model 3FLANGEC, chrome flange kit(s) installed under the cab to be used as engine compartment illumination. These light(s) will be activated automatically when the cab is raised.

4.125 ACCESS TO ENGINE DIPSTICKS - For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

4.125.1 The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

4.125.2 The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

4.126 MAP BOX - One (1) long map box with two (2) partitions will be installed to create a three (3) bin box open from top. The overall map box size will be 4 wide x 45 long x 8 deep and will then be divided into three (3) equal bins by use of permanent partitions.

4.126.1 The map box will be constructed of .125" aluminum and will be painted to match the cab interior.

4.126.2 There will be a quantity of one (1).

4.126.3 The map box will Mounted on forward wall of center EMS cabinet between driver and officer above the engine tunnel. Locate the top of the map box 3" down from the top of the cabinet, centered L/R.

4.127 CAB SAFETY SYSTEM - The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

4.127.1 A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.

4.127.2 A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.

4.127.3 A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.

4.127.4 A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.

4.127.5 A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.

4.127.6 Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.

4.127.7 Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.

4.127.8 Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

4.128 FRONTAL IMPACT PROTECTION - The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

4.128.1 The SRS system will deploy the following components in the event of a frontal or oblique impact event:

4.128.2 Driver side front air bag

4.128.3 Passenger side knee bolster air bag

4.128.4 Air curtains mounted in the outboard bolster of outboard seat backs

4.128.5 Suspension seats will be retracted to the lowest travel position

4.128.6 Seat belts will be pre-tensioned to firmly hold the occupant in place

4.129 SIDE ROLL PROTECTION - The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

4.129.1 The SRS system will deploy the following components in the event of a side roll:

4.129.2 Air curtains mounted in the outboard bolster of outboard seat backs

4.129.3 Suspension seats will be retracted to the lowest travel position

4.129.4 Seat belts will be pre-tensioned to firmly hold the occupant in place.

4.130 SEATING CAPACITY - The seating capacity in the cab will be five (5).

4.131 DRIVER SEAT - A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.12" travel) and horizontal (7.75" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

4.131.1 The seat will include the following features incorporated into the side roll protection system:

4.131.2 Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

4.131.3 A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

4.131.4 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.132 OFFICER SEAT - A Pierce PS6® seat will be provided in the cab for the officer. The seat will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple passenger configurations, the seat will have a reclining back adjustable from 20 degrees back to 0 degrees forward. The seat back will be a high back style with manual lumbar adjustment lever, and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat will include the following features incorporated into the side roll protection system:

4.132.1 Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

4.132.2 A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

4.132.3 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.133 REAR FACING DRIVER SIDE EMS COMPARTMENT - A rear facing EMS compartment will be provided in the crew cab at the driver side outboard position. The compartment will be mounted 4.50" off the edge of the seat riser.

4.133.1 The compartment will be 20.00" wide x 30.00" high x 25.00" deep with one (1) Amdor roll up door, non-locking, with white finish, radius track style. That is, it will travel over the top and down the back of the compartment. Front top corners of the compartment will be radiused. This will allow access through the front and top section of the compartment.

4.133.2 The compartment will be constructed of smooth aluminum and painted to match the cab interior. A shield will be installed to keep items in this compartment from falling into the door tracking area and jamming the door.

4.133.3 Compartment Light - There will be one (1) white LED strip light installed on the left side of the compartment opening. The lights will be controlled by an automatic door switch.

4.134 STORAGE COMPARTMENT - A rear facing compartment will be provided in the crew cab on the rear of the engine tunnel. The compartment will mount flush with the rear edge of the tunnel.

4.134.1 The compartment will be approximately 47.50" wide x 20.50" high. The compartment will be approximately 17.00" deep at the bottom and 20.00" deep at the top. In place of a door, the compartment will have a heavy black nylon webbing made of 1.00" nylon strap with a 2.00" box pattern. Side-release buckles will be used to fasten all sides of the opening.

4.134.2 A permanent vertical partition will be provided on the left side of the compartment. The partition will be mounted to provide an 18.00" wide clear opening on the left side of the compartment. An adjustable shelf will be provided on the right side of the partition. Each shelf will be constructed of 0.090" aluminum with a 1.25" up-turned lip. Shelving will be infinitely adjustable by means of a threaded tightener sliding in a track.

4.134.3 The compartment will be constructed of smooth aluminum and painted to match the cab interior.

4.134.4 Compartment Light - There will be two (2) white LED strip lights installed, one (1) each side of the compartment opening. The lights will be controlled by a switch on the exterior of the compartment.

4.135 STORAGE COMPARTMENT - A rear facing radio storage compartment will be provided in the crew cab at the passenger side outboard position. The compartment will be mounted 4.50" off the edge of the seat riser.

4.135.1 The compartment will be 20.00" wide x 30.00" high x 23.00" deep and will be provided with an access panel that screws into place. There will be ventilation holes provided in the access panel.

4.135.2 The compartment will be constructed of smooth aluminum, and painted to match the cab interior.

4.136 FORWARD FACING DRIVER SIDE OUTBOARD SEAT - There will be one (1) forward facing, Pierce PS6® seat provided at the left side outboard position in the crew cab. The seat back will be a high back style with 7.5 degree fixed recline angle, and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat will include the following features incorporated into the side roll protection system:

4.136.1 Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

4.136.2 A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

4.136.3 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.136.4 The seat will be moved approximately 3.00" inboard from the standard location.

4.137 FORWARD FACING CENTER SEAT - There will be one (1) forward facing, Pierce PS6® seat provided at the center position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat will include the following feature incorporated into the side roll protection system:

4.137.1 A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

4.137.2 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.138 FORWARD FACING PASSENGER SIDE OUTBOARD SEAT - There will be one (1) forward facing, Pierce PS6® seat provided at the right-side outboard position in the crew cab. The seat back will be a high back style with 7.50 degree fixed recline angle and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled. The seat will include the following features incorporated into the side roll protection system:

4.138.1 Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

4.138.2 A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

4.138.3 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.138.4 The seat will be moved approximately 3.00" inboard from the standard location.

4.139 SHELVING - There will be one (1) shelf provided. Each shelf will be constructed of 0.090" aluminum with a 1.25" up-turned lip. Shelving will be infinitely adjustable by means of a threaded tightener sliding in a track.

4.139.1 The location will be one (1) shelf in the center rear facing EMS cabinet.

4.140 CAB COMPARTMENT LIGHTING - There will be one (1) Pierce 20.00" LED compartment light strip(s) provided in passenger side rear facing EMS compartment. Mount the switch like 29674.

4.140.1 Opening the compartment door shall automatically turn compartment lighting on.

4.141 SEAT UPHOLSTERY - All seat upholstery will be black Turnout Tuff material.

4.142 SEAT BELTS - All seating positions in the cab and crew cab will have red seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

4.142.1 The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

4.143 SHOULDER HARNESS HEIGHT ADJUSTMENT - All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

4.143.1 A total of five (5) seating positions will have the adjustable shoulder harness.

4.144 CAB DOME LIGHTS - There will be four (4) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

4.144.1 The color of the LED's will be red and white.

4.144.2 The white LED's will be controlled by the lens switch.

4.144.3 The color LED's will be controlled by the lens switch.

4.145 ADDITIONAL DOME LIGHTS - There will be one (1) 6.00" round Whelen, Model 60CREGCS white and red LED dome light installed in the cab located drivers side light centered in the ceiling panel in front of the 2 forward facing seats.

4.145.1 The white light will be controlled by the door switch and a switch on the light.

4.145.2 The red light will be controlled by the switch on the light.

4.145.3 OVERHEAD MAP LIGHTS - There will be two (2) Peterson, Model M371S, rectangular LED adjustable map lights installed in the cab:

4.145.4 One (1) overhead in front of the driving position.

4.145.5 One (1) overhead in front of the passenger's position.

4.145.6 Each light will include a switch on the light housing.

4.145.7 The light switches will be energized when the spare wire cut off switch is on.

4.146 HAND HELD SPOTLIGHT - There will be four (4) Streamlight, Model Survivor 90503, LED flashlights with chargers and AC/DC chords provided and installed one each side in the front of the cab to the rear of the cab door on the angled portion (nuts on the outside) and two in the rear crew cab area on the wire cover at the ceiling, match 29756 EXACTLY.

4.147 POWER TO HAND HELD SPOTLIGHT - The 12 volt DC power to recharge the hand lights will be from the spare wire fuse panel located in the in service out of service switch, match 29756.

4.148 HAND HELD LIGHT - There will be two (2) lights Streamlight E-Spot, LiteBox Vehicle Mount Systems, Model 45855, LED hand held flashlights with an orange thermoplastic body provided.

4.148.1 The location will be mounted on top of the DS EMS compartment, match 29756 as close as possible.

4.148.2 The system will include the hand light, a charger and the vehicle mount system and strap.

4.149 CAB INSTRUMENTATION - The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

4.150 GAUGES - The gauge panel will include the following ten (10) black gauges with chrome bezels to monitor vehicle performance:

4.150.1 Voltmeter gauge (Volts)

- **A.** Low volts (11.8 VDC) - Amber indicator on gauge assembly with alarm
- **B.** High volts (15 VDC) - Amber indicator on gauge assembly with alarm
- **C.** Very low volts (11.3 VDC) - Amber indicator on gauge assembly with alarm
- **D.** Very high volts (16 VDC) - Amber indicator on gauge assembly with alarm

4.150.2 Tachometer (RPM)

4.150.3 Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

4.150.4 Fuel level gauge (Empty - Full in fractions)

- **A.** Low fuel (1/8 full) - Amber indicator on gauge assembly with alarm
- **B.** Very low fuel (1/32) fuel - Amber indicator on gauge assembly with alarm
- **C.** Engine oil pressure gauge (PSI) - Low oil pressure to activate engine warning lights and alarms - Red indicator on gauge assembly with alarm

4.150.5 Front air pressure gauge (PSI) - Low air pressure to activate warning lights and alarm = Red indicator on gauge assembly with alarm

4.150.6 Rear air pressure gauge (PSI) - Low air pressure to activate warning lights and alarm - Red indicator on gauge assembly with alarm

4.150.7 Transmission oil temperature gauge (Fahrenheit) - High transmission oil temperature activates warning lights and alarm ; Amber indicator on gauge assembly with alarm

4.150.8 Engine coolant temperature gauge (Fahrenheit) - High engine temperature activates an engine warning light and alarm; Red indicator on gauge assembly with alarm

4.150.9 Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

- **A.** Low fluid (1/8 full) - Amber indicator on gauge assembly with alarm

4.150.10 All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

4.151 INDICATOR LAMPS - To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

4.151.1 The following amber telltale lamps will be present:

A. Low coolant
B. Trac cntl (traction control) (where applicable)
C. Check engine
D. Check trans (check transmission)
E. Aux brake overheat (Auxiliary brake overheat)
F. Air rest (air restriction)
G. Caution (triangle symbol)
H. Water in fuel
I. DPF (engine diesel particulate filter regeneration)
J. Trailer ABS (where applicable)
K. Wait to start (where applicable)
L. HET (engine high exhaust temperature) (where applicable)
M. ABS (antilock brake system)
N. MIL (engine emissions system malfunction indicator lamp) (where applicable)
O. SRS (supplemental restraint system) fault (where applicable)
P. DEF (low diesel exhaust fluid level)
Q. The following red telltale lamps will be present:
R. Warning (stop sign symbol)
S. Seat belt
T. Parking brake
U. Stop engine
V. Rack down

4.151.2 The following green telltale lamps will be provided:

A. Left turn
B. Right turn
C. Battery on

The following blue telltale lamp will be provided:

A. High beam

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

4.152.1 Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

4.152.2 Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

4.153 INDICATOR LAMP AND ALARM PROVE-OUT - Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

4.154 CONTROL SWITCHES - For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

4.154.1 Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

4.154.2 Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

4.154.3 Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

4.154.4 The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

A. High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

B. "Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

4.154.5 The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

A. Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

B. Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

C. 4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

D. Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

E. Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

F. Parking brake control: An air actuated push/pull park brake control valve will be provided.

G. Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

4.155 CUSTOM SWITCH PANELS - The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

4.156 DIAGNOSTIC PANEL - A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

A. The diagnostic panel will include the following:
B. Engine diagnostic port
C. Transmission diagnostic port
D. ABS diagnostic port
E. SRS diagnostic port (where applicable)
F. Command Zone USB diagnostic port
G. ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
H. Diesel particulate filter regeneration switch (where applicable)
I. Diesel particulate filter regeneration inhibit switch (where applicable)

4.157 CAB LCD DISPLAY -A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

4.157.1 The upper right section will display, along with other configuration specific information:

A. Odometer
B. Trip mileage
C. PTO hours
D. Fuel consumption
E. Engine hours

4.157.2 The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

4.158 AIR RESTRICTION INDICATOR - A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.

4.159 "DO NOT MOVE APPARATUS" INDICATOR - A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

4.159.1 The same circuit that activates the Do Not Move Apparatus indicator will activate a steady tone alarm when the parking brake is released.

4.160 DO NOT MOVE TRUCK MESSAGES - Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

A. The following messages will be displayed (where applicable):
B. Do Not Move Truck
C. DS Cab Door Open (Driver Side Cab Door Open)
D. PS Cab Door Open (Passenger's Side Cab Door Open)
E. DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
F. PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
G. DS Body Door Open (Driver Side Body Door Open)
H. PS Body Door Open (Passenger's Side Body Door Open)
I. Rear Body Door Open
J. DS Ladder Rack Down (Driver Side Ladder Rack Down)
K. PS Ladder Rack Down (Passenger Side Ladder Rack Down)
L. Deck Gun Not Stowed
M. Lt Tower Not Stowed (Light Tower Not Stowed)
N. Hatch Door Open
O. Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
P. Aerial Not Stowed (Aerial Device Not Stowed)
Q. Stabilizer Not Stowed
R. Steps Not Stowed
S. Handrail Not Stowed
T. Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

4.161 SWITCH PANELS - The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

4.161.1 Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

4.161.2 The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

4.162 WIPER CONTROL - For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

4.163 HOUR METER (AERIAL DEVICE) - An hour meter for the aerial device will be provided and located within the cab display or instrument panel.

4.164 AERIAL MASTER - There will be a master switch for the aerial operating electrical system provided.

4.165 AERIAL PTO SWITCH - A PTO switch for the aerial with indicator light will be provided.

4.166 SPARE CIRCUIT - There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

4.166.1 The positive wire will be connected directly to the battery power.

4.166.2 The negative wire will be connected to ground.

4.166.3 Wires will be protected to 15 amps at 12 volts DC.

4.166.4 Power and ground will terminate in the overhead switch panel centered above officer, wiring to be connected to the in service / out of service switch.

4.166.5 Termination will be with heat shrinkable butt splicing.

4.166.6 Wires will be sized to 125 percent of the protection.

4.166.7 This circuit(s) may be load managed when the parking brake is set.

4.167 SPARE CIRCUIT - There will be three (3) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

4.167.1 The positive wire will be connected to the auxiliary switch located on the instrument panel to the right of the steering wheel, option 614250.

4.167.2 The negative wire will be connected to ground.

4.167.3 Wires will be protected to 60 amps at 12 volts DC.

4.167.4 Power and ground will terminate in the passenger side radio compartment in the crew cab, all flashlights, power points, radios and charger, rocket modem must be connected to these terminal strips.

4.167.5 Termination will be to a Blue Sea System, model 5026, 12 circuit with negative bus bar, straight blade fuse block. The terminal block will include a cover with circuit labels.

4.167.6 Wires to the fuse block will be sized to 125% of the protection.

4.167.7 This circuit(s) may be load managed when the parking brake is applied.

4.168 SPARE CIRCUIT - There will be a Cole Hersee part number 75908 disconnect switch installed in the spare wire circuit(s) to connect or disconnect the power to the spare wire(s) located the in service / out of service circuits. The label and switch will be installed in the panel below the dash where the back-up camera speaker would fit.

4.169 SPARE CIRCUIT - There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

4.169.1 The positive wire will be connected directly to the battery power.

4.169.2 The negative wire will be connected to ground.

4.169.3 Wires will be protected to 15 amps at 12 volts DC.

4.169.4 Power and ground will terminate One in DS rear facing EMS compt. mounted at the top, and one in the center rear facing EMS box must be mounted PS rear shelf track . All must be wired to the in/out service breaker panels in the PS rear facing radio compartment-.

A. Termination will be with 15 amp, power point plug with rubber cover.

B. Wires will be sized to 125% of the protection.

C. This circuit(s) may be load managed when the parking brake is set.

4.170 SPARE CIRCUIT -There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

4.170.1 The positive wire will be connected directly to the battery power
4.170.2 The negative wire will be connected to ground
4.170.3 Wires will be protected to 15 amps at 12 volts DC
4.170.4 Power and ground will terminate officer side dash area and Switch Panel # 9
4.170.5 Termination will be with 15 amp, power point plug with rubber cover
4.170.6 Wires will be sized to 125 percent of the protection
4.170.7 The circuit(s) may be load managed when the parking brake is set.

4.171 SPARE CIRCUIT - There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.
4.171.1 The above wires will have the following features:
4.171.2 The positive wire will be connected directly to the battery power.
4.171.3 The negative wire will be connected to ground.
4.171.4 Wires will be protected to 40 amps at 12 volts DC.
4.171.5 Power and ground will terminate PS EMS rear facing cabinet.
4.171.6 Termination will be with 3/8" studs and plastic covers.
4.171.7 Wires will be sized to 125% of the protection.
4.171.8 This circuit(s) may be load managed when the parking brake is set.

4.172 SPARE CIRCUIT -There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

4.172.1 The positive wire will be connected directly to the battery power.
4.172.2 The negative wire will be connected to ground.
4.172.3 Wires will be protected to 15 amps at 12 volts DC.
4.172.4 Power and ground will terminate one each side under the open top, 3 slot map box, mounted to the center EMS compartment. Make sure these are connected to the Blue Sea junction boxes thru the in service / out of service switch.
4.172.5 Termination will be with 15 amp, power point plug with rubber cover.
4.172.6 Wires will be sized to 125% of the protection.
4.172.7 This circuit(s) may be load managed when the parking brake is set.

4.173 EMERGENCY LIGHT SWITCHES - The emergency light switching will work as follows: The emergency master switch must be activated for all emergency lighting to function.

4.173.1 The emergency master "saved states" feature will not be activated. This means that if the emergency master switch is on and individual switch is turned off. Then the emergency master is turned off, upon turning the emergency master switch back on the individual switch which was previously turn off will turn back on.

4.173.2 All emergency lighting will be turned on whenever the emergency master switch is turned on.

4.173.3 Individual emergency light switches may be deactivated and/or reactivated after the emergency master switch is turned on.

4.173.4 Switches will be per the following: Emergency Master, Lightbar, Front Warning, Side Warning, Rear Warning, High Beam Flash will be combined with Front Warning, Upper & Lower Rear Warning will be combined under Rear Warning.

4.174 STEREO RADIO - A Jensen, heavy duty AM/FM/CD/Weatherband stereo radio, with front auxiliary input will be installed per switch panel layout. There will be 5.25" speakers installed one (1) pair of 5.25" speakers in the cab and one (1) pair of 5.25" speakers in the crew cab. The antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof. The following features will be included:

4.174.1 CD Player with Electronic Skip Protection (ESP)

4.174.2 Full 7-Channel NOAA Weatherband Tuner with SAME technology

4.174.3 Built-in Clock

4.174.4 Radio Broadcast Data System Text Display

4.174.5 Front panel USB input

4.174.6 Front and Rear Auxiliary Audio Input

4.174.7 Receives audio (A2DP/AVRCP) from Bluetooth enabled device

4.174.8 Supports Bluetooth HFP to receive phone calls from BT-enabled phones

4.174.9 Low battery alert (Alt;10.8Vdc)

4.174.10 Heavy Duty design with Conformal Coated Circuit Boards for maximum durability under all conditions

4.175 SWITCH, MASTER, AM/FM RADIO - A remote switch will be provided inside the cab to control turning off the AM/FM radio. The switch will be installed drivers side switch panel. The radio will automatically turn on with truck.

4.176 PUSH BUTTON MOUNTING BRACKET - A mounting bracket will be provided chrome buttons will be in the wedge bracket near the officer. DO NOT MOUNT UNTIL PICKUP. Match to job 29756 and see pictures. They will locate near with wiring coming from below the engine tunnel mount plate for the mounting of push button controls. The mounting bracket will be large enough for three (3) push buttons. The controls and labels will be mounted horizontally, next to each other. The bracket will be fabricated from smooth aluminum and painted to match work surface.

4.177 INFORMATION CENTER - An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing. The information center will have the following specifications:

4.177.1 Operate in temperatures from -40 to 185 degrees Fahrenheit

4.177.2 An Optical Gel will be placed between the LCD and protective lens

4.177.3 Five weather resistant user interface switches

4.177.4 Grey with black accents

4.177.5 Sunlight Readable

4.177.6 Linux operating system

4.177.7 Minimum of 1000nits rated display

4.177.8 Display can be changed to an available foreign language

4.177.9 A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.

4.177.10 Programmed to read US Customary

4.178 GENERAL SCREEN DESIGN - Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

4.178.1 If a caution or warning situation arises the following will occur:

4.178.2 An amber background/text color will indicate a caution condition

4.178.3 A red background/text color will indicate a warning condition

4.178.4 The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.

4.178.5 A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

4.179 HOME/TRANSIT SCREEN - This screen will display the following:

4.179.1 Vehicle Mitigation (if equipped)

4.179.2 Water Level (if equipped)

4.179.3 Foam Level (if equipped)

4.179.4 Seat Belt Monitoring Screen

4.179.5 Tire Pressure Monitoring (if equipped)

4.179.6 Digital Speedometer

4.179.7 Active Alarms

4.180 ON SCENE SCREEN - This screen will display the following and will be auto activated with pump engaged (if equipped):

4.180.1 Battery Voltage

4.180.2 Fuel

4.180.3 Oil Pressure

4.180.4 Coolant Temperature

4.180.5 RPM

4.180.6 Water Level (if equipped)

4.180.7 Foam Level (if equipped)

4.180.8 Foam Concentration (if equipped)

4.180.9 Water Flow Rate (if equipped)

4.180.10 Water Used (if equipped)

4.180.11 Active Alarms

4.181 VIRTUAL BUTTONS - There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

4.182 PAGE SCREEN - The page screen will display the following and allow the user to progress into other screens for further functionality:

4.182.1 Diagnostics
4.182.2 Faults
4.182.3 Listed by order of occurrence
4.182.4 Allows to sort by system
4.182.5 Interlock
4.182.6 Throttle Interlocks
4.182.7 Pump Interlocks (if equipped)
4.182.8 Aerial Interlocks (if equipped)
4.182.9 PTO Interlocks (if equipped)

4.183 **LOAD MANAGER** - A list of items to be load managed will be provided. The list will provide a description of the load. The lower the priority numbers the earlier the device will be shed should a low voltage condition occur. The screen will indicate if a load has been shed (disabled) or not shed. "At a glance" color features are utilized on this screen:

4.183.1 Systems
4.183.2 Command Zone
4.183.3 Module type and ID number
4.183.4 Module Version
4.183.5 Input or output number
4.183.6 Circuit number connected to that input or output
4.183.7 Status of the input or output
4.183.8 Power and Constant Current module diagnostic information
4.183.9 Foam (if equipped)
4.183.10 Pressure Controller (if equipped)
4.183.11 Generator Frequency (if equipped)
4.183.12 Live Data
4.183.13 General Truck Data
4.183.14 Maintenance
4.183.15 Engine oil and filter
4.183.16 Transmission oil and filter
4.183.17 Pump oil (if equipped)
4.183.18 Foam (if equipped)
4.183.19 Aerial (if equipped)
4.183.20 Setup availability for the following:
- A. Clock Setup
- B. Date & Time
- C. 12 or 24 hour format
- D. Set time and date
- E. Backlight
- F. Daytime
- G. Night time
- H. Sensitivity
- I. Unit Selection
- J. Home Screen
- K. Virtual Button Setup
- L. On Scene Screen Setup
- M. Configure Video Mode
- N. Set Video Contrast
- O. Set Video Color
- P. Set Video Tint

4.184 **DO NOT MOVE** - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated:

4.184.1 Driver Side Cab Door
4.184.2 Passenger's Side Cab Door
4.184.3 Driver Side Crew Cab Door
4.184.4 Passenger's Side Crew Cab Door
4.184.5 Driver Side Body Doors
4.184.6 Passenger's Side Body Doors
4.184.7 Rear Body Door(s)
4.184.8 Ladder Rack (if applicable)
4.184.9 Deck Gun (if applicable)
4.184.10 Light Tower (if applicable)
4.184.11 Hatch Door (if applicable)
4.184.12 Stabilizers (if applicable)
4.184.13 Steps (if applicable)
4.184.14 Notifications

4.185 VIEW ACTIVE ALARMS - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm:

4.185.1 Silence Alarms - All alarms are silenced
4.185.2 Timer Screen
4.185.3 HVAC (if equipped)
4.185.4 Tire Information (if equipped)
4.185.5 Ascendant Set Up Confirmation (if equipped)
4.185.6 Button functions and button labels may change with each screen.

4.186 VEHICLE DATA RECORDER - There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided. The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

4.186.1 The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:
4.186.2 Vehicle Speed - MPH
4.186.3 Acceleration - MPH/sec
4.186.4 Deceleration - MPH/sec
4.186.5 Engine Speed - RPM
4.186.6 Engine Throttle Position - % of Full Throttle
4.186.7 ABS Event - On/Off
4.186.8 Seat Occupied Status - Yes/No by Position
4.186.9 Seat Belt Buckled Status - Yes/No by Position
4.186.10 Master Optical Warning Device Switch - On/Off
4.186.11 Time - 24 Hour Time
4.186.12 Date - Year/Month/Day

4.187 SEAT BELT MONITORING SYSTEM - A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display and in the center overhead of the cab instrument panel. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

4.187.1 Seat Occupied & Buckled = Green LED indicator illuminated

4.187.2 Seat Occupied & Unbuckled = Red LED indicator with audible alarm

4.187.3 No Occupant & Buckled = Red LED indicator with audible alarm

4.187.4 No Occupant & Unbuckled = No indicator and no alarm

4.187.5 The seat belt monitoring screen will become active on the Command Zone color display when:

A. The home screen is active:

B. and there is any occupant seated but not buckled or any belt buckled with an occupant.

C. and there are no other Do Not Move Apparatus conditions present.

4.187.6 As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

4.187.7 The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

4.188 INTERCOM SYSTEM - There will be digital, dual radio interface, intercom located in the cab. The front panel will have master volume, and squelch controls with illuminated indicators, allowing for independent level setting of radio and auxiliary audio devices.

4.188.1 There will be two (2) radio listen only / transmit controls, allowing for simulcast interoperability with select, monitor, receive, and transmit indicators. There will be two (2) auxiliary audio inputs with select, and receive indicators.

4.188.2 There will be one (1) wireless base station for up to five (1-5) headset users provided.

4.188.3 The wireless base station will have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range.

4.188.4 The following Firecom components will be provided:

4.188.5 One (1) 5200D Intercom

4.188.6 One (1) WB505R wireless base station (1-5 wireless positions)

4.188.7 All necessary power and station cabling

4.189 WIRELESS UNDER HELMET, RADIO TRANSMIT ONLY HEADSET - There will be four (4) Firecom™, Model UHW-505, wireless under the helmet, radio transmit headset(s) provided. A heavy duty, coiled 12 volt charging pigtail with plug will be provided driver's seat, officer seat, driver's side outboard forward facing seat and passenger's side outboard forward facing seat. Each headset will feature:

4.189.1 Noise cancelling electric microphone

4.189.2 Flexible microphone boom

4.189.3 Ear seals with 20 dB noise reduction

4.189.4 Stereo Listen-Through Ear dome microphones

4.189.5 Radio Push To Transmit button (Left or Right Side)

4.189.6 Rechargeable battery operates for 24 hours on a full charge

4.189.7 IP-66 when worn

4.190 HEADSET HANGERS - There will be four (4) headset hanger(s) installed driver's seat, officer's seat, driver's side outboard forward facing seat and passenger's side inboard forward facing seat. The hanger(s) will meet NFPA 1901, Section 14.1.11, requirement for equipment mounting.

4.191 AUXILIARY AUDIO CABLE - An auxiliary 3.5mm stereo male to 2 RCA male audio cable will be provided from the intercom aux inlet to the AM/FM radio. Auxiliary audio will be mixed with the two-way radio and intercom traffic at exactly one half the strength of the signal in the headsets.

4.192 REMOTE ON/OFF SWITCH FOR AM/FM RADIO - a remote on/off switch will be supplied in a location to be determined. The switch power will be directly tied to the ignition switch power.

4.193 COMPLETE MDT INSTALLATION - There will be one (1) Mobile Data Terminal (MDT), Docking station, mounting bracket, power supply, antenna, GPS, modem, and all cabling installed on the officer's side of the engine tunnel plate. Wiring shall be run under the plate so the mount can be near the officer's side forward. Specific shipping requirements will be followed.

4.194 PORTABLE RADIO CHARGER INSTALLATION - There will be four (4) City supplied portable two-way radio chargers(s) sent to the apparatus manufacturer's preferred radio installer to be installed two near the driver as located on attached drawing, one on the center crew box and one on the PS crew box as indicated in the supplied photo. Specific shipping requirements will be followed.

4.195 GPS ANTENNA INSTALLATION - There will be one (1) GPS antenna(s) installed on the roof. The antenna coax cable(s) will be run from the antenna to PASSENGER SIDE JUST BEHIND THE LIGHT BAR. Cable routed to cab electronics cabinet behind the officer position. This must have at least 2' of cable to extended outside the box and a connector provided, if necessary. Specific shipping requirements will be followed.

4.196 RADIO ANTENNA MOUNT – There will be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed One to the rear of driver side A/C routed to the radio box behind the officer. At least 2' of cable must be able to get outside of the box on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the radio box. A weatherproof cap will be installed on the mount. At least one will have a STiCO model MABVT8 antenna attached and the other will have a cap placed to make the connection weather tight.

4.197 RADIO INSTALLED - There will be one Unity XM-100M Mobile radio (or comparable as approved by Fire Department Apparatus Committee) with handheld controller installed in radio compartment. The control head will be installed in the overhead compartment above officer's seat. This radio will be capable of broadcasting on VHF/700MHZ and 800MHZ.

4.198 VEHICLE CAMERA SYSTEM - There will be a color vehicle camera system provided with the following:

4.198.1 One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

4.198.2 The camera images will be displayed on the driver's Command Zone™, color display. Audio from the microphone on the active camera will be not provided.

4.198.3 The following components will be included:

4.198.4 One (1) SV-CW134639CAI, camera

4.198.5 One (1) amplified speaker (if applicable)

4.198.6 All necessary cables

4.199 VEHICLE CAMERA GUARD - There will be one (1) aluminum treadplate guard(s) fastened over the vehicle camera(s) located Centered on the rear.

4.200 ELECTRICAL POWER CONTROL SYSTEM - The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional 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.

4.200.1 Distribution centers located throughout the vehicle will contain battery powered studs for supplying City installed equipment thus providing a lower cost of ownership.

4.200.2 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 Type-I automatic reset (continuously resetting). 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.

4.201 SOLID-STATE CONTROL SYSTEM - A solid-state electronics-based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of

electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

4.201.1 The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

4.201.2 For increased reliability and simplified use the control system modules will include the following attributes:

- **A.** Green LED indicator light for module power
- **B.** Red LED indicator light for network communication stability status
- **C.** Control system self test at activation and continually throughout vehicle operation
- **D.** No moving parts due to transistor logic
- **E.** Software logic control for NFPA mandated safety interlocks and indicators
- **F.** Integrated electrical system load management without additional components
- **G.** Integrated electrical load sequencing system without additional components
- **H.** Customized control software to the vehicle's configuration
- **I.** Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- **J.** Complete operating and troubleshooting manuals
- **K.** USB connection to the main control module for advanced troubleshooting

4.201.3 To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- **A.** Module circuit board will meet SAE J771 specifications
- **B.** Operating temperature from -40C to +70C
- **C.** Storage temperature from -40C to +70C
- **D.** Vibration to 50g
- **E.** IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
- **F.** Operating voltage from eight (8) volts to 16 volts DC
- **G.** The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

4.202 CIRCUIT PROTECTION AND CONTROL DIAGRAM - Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

4.203 ON-BOARD ELECTRICAL SYSTEM DIAGNOSTICS - Advanced on-board diagnostic messages will be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages will be displayed on the information center located at the driver's position. The on-board information center will include the following diagnostic information:

4.203.1 Text description of active warning or caution alarms

4.203.2 Simplified warning indicators

4.203.3 Amber caution indication with intermittent alarm

4.203.4 Red warning indication with steady tone alarm

4.204 TECH MODULE WITH WIFI - An in cab module will provide WiFi wireless interface and data logging capability. (No Exception) The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

4.204.1 The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

4.204.2 The data logging capability will record faults from the engine, transmission, ABS and Command Zone, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

4.204.3 A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

4.205 PROGNOSTICS - A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events (no exceptions). The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals. Prognostics will include:

4.205.1 Engine oil and filter

4.205.2 Transmission oil and filter

4.205.3 Pump oil (if equipped)

4.205.4 Foam oil (if equipped)

4.205.5 Aerial oil and filter (if equipped)

4.206 ADVANCED DIAGNOSTICS - An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device. The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

4.207 INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM - A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

4.208 VOLTAGE MONITOR SYSTEM - A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels. The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

4.209 DEDICATED RADIO EQUIPMENT CONNECTION POINTS - There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment. The studs will consist of the following:

4.209.1 12-volt 40-amp battery switched power

4.209.2 12-volt 60-amp ignition switched power

4.209.3 12-volt 60-amp direct battery power

4.209.4 There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

4.210 ENHANCED SOFTWARE - The solid-state control system will include the following software enhancements:

4.210.1 All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

4.210.2 Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

4.210.3 Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

4.211 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.

4.211.1 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 is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

4.211.2 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.

4.212 ELECTRICAL - All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. 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:

4.212.1 All holes made in the roof will be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

4.212.2 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.

4.212.3 Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.

4.212.4 Corrosion preventative compound will be applied to all terminal plugs 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).

4.212.5 All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

4.212.6 All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

4.212.7 All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

4.212.8 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.

4.212.9 The results of the tests will be recorded and provided to the purchaser at time of delivery.

4.213 BATTERY SYSTEM - Six (6) 12 volt, Exide, Model 31S950X1W, group 31 batteries that include the following features will be provided:

4.213.1 950 CCA, cold cranking amps

4.213.2 190 amp reserve capacity

4.213.3 High cycle

4.213.4 Rating of 5700 CCA at 0 degrees Fahrenheit

4.213.5 1140 minutes of reserve capacity

4.213.6 SAE Posts

4.213.7 Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

4.213.8 The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

4.214 BATTERY SYSTEM - A single starting system will be provided.

4.214.1 An ignition switch and starter button will be located on the instrument panel.

4.215 MASTER BATTERY SWITCH - There will be a Cole Hersee, Model 75908, master battery switch to activate the battery system, provided inside the cab within easy reach of the driver.

4.215.1 An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

4.216 BATTERY COMPARTMENTS - The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

4.217 JUMPER STUDS - One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

4.218 BATTERY CHARGER - There will be a Blue Sea P12, 40 amp battery charger provided with model remote bar graph display.

4.218.1 The battery charger will be wired to the ac shoreline inlet.

4.218.2 Battery charger will be rear facing seat risers, compressor on the ds and the charger on the ps. Pump must be down low with the pump discharge mounted down as indicated on the installation instructions. The charger must have the 120 volt receptacle, not hard wired.

4.218.3 The battery charger indicator will be located behind the driver's door on the outside of the cab.

4.219 AUTO EJECT FOR SHORELINE - There will be one (1) blue sea sure eject™ part number 7851, 20 amp 120 volt ac shoreline inlet provided to operate the dedicated 120 volt ac circuits on the apparatus.

4.219.1 The shoreline will be connected to battery changer and air compressor, and the receptacles in d4 and p4.

4.219.2 The shoreline inlet cover color must be red.

4.219.3 The connector body will be released from the inlet when the apparatus engine start button is activated.

4.219.4 There will be a mating connector body supplied with the loose equipment.

4.219.5 There will be a label installed near the inlet(s) that state the following:

4.219.6 Line voltage

4.219.7 Current ratting (amps)

4.219.8 Phase

4.219.9 Frequency

4.219.10 The shoreline receptacle will be located on the driver side of cab, above wheel.

4.220 ALTERNATOR - A Delco Remy®, Model 55SI, alternator will be provided. It will have a rated output current of 430 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

4.221 RELOCATE REAR POWER DISTRIBUTION - The command zone modules at the rear of the truck will be relocated to the left side rear outrigger area. In place of a box, the modules will be mounted on a job color painted aluminum hat section plate. The plate will be mounted to the rear wall in this area.

4.222 ELECTRONIC LOAD MANAGER- An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

4.222.1 For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed. The system will include the following features:

- **A.** System voltage monitoring.
- **B.** A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- **C.** Sixteen available electronic load shedding levels.
- **D.** Priority levels can be set for individual outputs.
- **E.** High Idle to activate before any electric loads are shed and deactivate with the service brake.

4.222.2 If enabled:

- **A.** "Load Man Hi-Idle On" will display on the information center.
- **B.** Hi-Idle will not activate until 30 seconds after engine start up.
- **C.** Individual switch "on" indicator to flash when the particular load has been shed.
- **D.** The information center indicates system voltage.

4.222.3 The information center, where applicable, includes a "Load Manager" screen indicating the following:

4.222.4 Load managed items list, with priority levels and item condition.

- **A.** Individual load managed item condition:
- **B.** ON = not shed
- **C.** SHED = shed

4.223 SEQUENCER - A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

4.223.1 For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

4.223.2 Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

4.223.3 When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

4.223.4 Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- **A.** Cab Heater and Air Conditioning
- **B.** Crew Cab Heater (if applicable)
- **C.** Crew Cab Air Conditioning (if applicable)
- **D.** Exhaust Fans (if applicable)
- **E.** Third Evaporator (if applicable)

4.224 HEADLIGHTS - There will be four (4) HI-VIZ LED round light assemblies mounted in the front chrome trim housing on each side of the cab grille. The headlight system will be two low beam and four high beam lights.

4.225 DIRECTIONAL LIGHTS -There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights. The color of the lenses will be clear.

4.226 INTERMEDIATE LIGHT - There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light will double as a turn signal and marker light.

4.227 CAB CLEARANCE/MARKER/ID LIGHTS - there will be seven (5) Whelen, model 0sa00mcr, amber led lights with a chrome bezel provided to indicate the presence and overall width of the vehicle in the following locations:

- **A.** Three (3) amber led identification lights will be installed on the front of the aerial basket, centered.
- **B.** Two (2) amber led clearance/marker lights will be installed, one (1) on each corner of the aerial basket visible from the side and the front of the vehicle.

4.228 REAR CLEARANCE/MARKER/ID LIGHTING – There will be three (3) Whelen®, Model 0SR00MCR, LED lights used as identification lights.

4.228.1 located at the rear of the apparatus per the following:

- **A.** As close as practical to the vertical centerline
- **B.** Centers spaced not less than 6.00" or more than 12.00" apart
- **C.** Red in color
- d. All at the same height

4.228.2 There will be two (2) Whelen®, Model 0SR00MCR, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- **A.** To indicate the overall width of the vehicle
- **B.** One (1) each side of the vertical centerline
- **C.** As near the top as practical
- **D.** Red in color
- **E.** Must be visible from the rear
- **F.** All at the same height

4.228.3 There will be two (2) Whelen®, Model 0SR00MCR, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- **A.** To indicate the overall length of the vehicle
- **B.** One (1) each side of the vertical centerline
- **C.** As near the top as practical
- **D.** Red in color
- **E.** Must be visible from the side
- **F.** All at the same height
- **G.** There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.
- **H.** There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.Per FMVSS 108 and CMVSS 108 requirements.

4.229 MARKER LIGHTS - There will be one (1) pair of amber and red LED marker lights with rubber arm, located at the rear of the apparatus. The amber lens will face the front and the red lens will face the rear of the truck. These lights will be activated with the running lights and turn signal of the vehicle.

4.230 REAR FMVSS LIGHTING - The rear stop/tail and directional LED lighting will consist of the following:

4.230.1 Two (2) Whelen®, Model M62BTT, red LED stop/tail lights
4.230.2 Two (2) Whelen, Model M62T, amber LED arrow turn lights
4.230.3 The lights shall be provided with color lenses.
4.230.4 The lights will be mounted in a polished combination housing.
4.230.5 There will be two (2) Whelen Model M6BUW, LED backup lights provided in the tail light housing.

4.231 LICENSE PLATE BRACKET - There will be one (1) license plate bracket mounted on the rear of the body. A white LED light will illuminate the license plate. A polished stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

4.232 LIGHTING BEZEL - There will be two (2) Whelen, Model M6FCV4P, four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.

4.233 BACK-UP ALARM - A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

4.234 SONAR SAFETY SYSTEM - The apparatus will be equipped with a max 1 sonar back-up warning system. The system will automatically activate when the vehicle is placed in reverse. Four (4) electronic sensors will be installed on the vehicles rear bumper and will emit ultrasonic pulses and listen for the returning sonic echo that bounces off an obstacle within the system's operating range. This information will be transmitted by wire to a speaker behind the driver seat which warns the operator with a beeping sound indicating that there are potential obstacles at the rear of the vehicle and a clear voice tells the operator the countdown of the remaining distance in feet as the vehicle reverses.

4.235 CAB PERIMETER SCENE LIGHTS - There will be four (4) Amdor Model AY-9500-012, 12.00" white LED strip lights provided.

- **A.** One (1) under the driver's side cab access step.
- **B.** One (1) under the passenger's side cab access step.
- **C.** One (1) under the passenger's side crew cab access step.
- **D.** One (1) under the driver's side crew cab access step.
- **E.** The lights will be activated when the battery switch is on and the respective door is open and whenever control has been selected for the body perimeter lights.

4.236 BODY PERIMETER SCENE LIGHTS - There will be two (2) Amdor LumaBar H2O™, Model AY-9500-020, 20.00" 12 volt DC LED strip lights provided. The lights will be mounted in the following locations:

- **4.236.1** One (1) light under the driver's side turntable access steps
- **4.236.2** One (1) light under the passenger's side turntable access steps
- **4.236.3** The perimeter scene lights will be activated when the parking brake is applied and the reverse signal activated, activating all the side facing perimeter lights.

4.237 ADDITIONAL PERIMETER LIGHTS - There will be ten (10) lights Amdor® Luma Bar® H2O, Model AY-9500-012 12.00" white LED perimeter light(s) provided one (1) light under compartment D1, one (1) light under compartment P1, one (1) light under each side of the front bumper spaced evenly, one (1) light under each side of the rear tailboard, one (1) light under compartment D4, one (1) light under compartment P4, one (1) light under compartment D6 and one (1) light under compartment P6. These lights will be activated the same as the body perimeter lights.

4.238 STEP LIGHTS - All steps on the apparatus will be illuminated per the current edition of NFPA 1901 and will match the turn table access step lights.

4.239 SCENE LIGHTS - There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, passenger side upper between front and rear cab door. A control for the light(s) selected above will be the following:

- **4.239.1** a switch at the driver's side switch panel
- **4.239.2** opening the passenger's side cab or crew cab doors
- **4.239.3** a switch at the passenger's side switch panel
- **4.239.4** no additional switch location
- **4.239.5** These lights may be load managed when the parking brake is set.

4.240 SCENE LIGHTS - There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, drivers side upper between front and rear cab door.

- **4.240.1** A control for the light(s) selected above will be the following:
- **4.240.2** a switch at the driver's side switch panel
- **4.240.3** opening the driver's side cab or crew cab doors
- **4.240.4** a switch at the passenger's side switch panel
- **4.240.5** no additional switch location
- **4.240.6** These lights may be load managed when the parking brake is set.

4.241 12 VOLT LIGHTING - There will be one (1) Fire Research Spectra, Model SPA530-Q20-TW-*, 20,000 lumens 12 volt DC LED scene light(s) with top wire exit provided on push up side mount pole(s), location to be determined at pre-construction meeting.

- **4.241.1** The painted parts of this light assembly must be white with a chrome bezel.
- **4.241.2** The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the driver's side pump panel and by a switch at the passenger's side switch panel.
- **4.241.3** These lights will be connected to the Do Not Move Truck Indicator circuit.

4.242 12 VOLT LIGHTING - There will be one (1) Fire Research Spectra, Model SPA530-Q20-TW-*, 20,000 lumens 12 volt DC LED scene light(s) with top wire exit provided on push up side mount pole(s), location to be determined. The painted parts of this light assembly must be white with a chrome bezel. The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the driver's side pump panel and by a switch at the passenger's side switch panel. These lights will be connected to the Do Not Move Truck Indicator circuit.

4.243 12 VOLT LIGHTING - There will be one (1) Fire Research Spectra Max, Model SPA260-Q20, 12 volt LED surface mounted scene light(s) with white bezel(s) provided drivers side above the rear outrigger, on the painted panel. The light(s) will be controlled in the following way:

4.243.1 from the driver's side body scene light option control.
4.243.2 no additional switch location
4.243.3 no additional switch location
4.243.4 no additional switch location
4.243.5 The light(s) may be load managed when the parking brake is applied.

4.244 12 VOLT LIGHTING - There will be one (1) Fire Research Spectra Max, Model SPA260-Q20, 12 volt LED surface mounted scene light(s) with white bezel(s) provided passenger side above the rear outrigger, on the painted panel. The light(s) will be controlled in the following way:

4.244.1 from the passenger's side body scene light option control
4.244.2 no additional switch location
4.244.3 no additional switch location
4.244.4 no additional switch location
4.244.5 The light(s) may be load managed when the parking brake is applied.

4.245 REAR SCENE LIGHT(S) -There will be two (2) Whelen®, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, one (1) each side high on rear body bulkhead.

4.245.1 The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel and by a cup switch at the driver's side rear bulkhead.
4.245.2 The light(s) may be load managed when the parking brake is applied.

4.246 WALKING SURFACE LIGHT - There will be Model FRP, 4" round black 12 volt DC LED floodlight with bolt mount provided to illuminate the entire designated walking surface on top of the body. The light will be activated when the body step lights are on.

4.247 CARGO AREA - The cargo area will be fabricated of .125" 5052 aluminum with a tensile strength range of 31,000 to 38,000 psi. The sides will not form any portion of the fender compartments. The upper and rear edges of the side panels will have a double break for rigidity. The cargo area will be located ahead of the ladder turntable. Flooring of the cargo area will be aluminum treadplate.

4.248 TURNTABLE STEPS - Steps to access the turntable from the driver side and passenger side will be provided just behind the compartmentation. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The stepwell will be lined with bright aluminum treadplate to act as scuffplates. The steps will be connected to the "Do Not Move Truck" indicator. A handrail will be provided on each side of the access steps.

4.249 STEP LIGHTS - There will be three (3) white LED step lights provided for each set of aerial turntable access steps. In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. The step lights will be actuated by the aerial master switch in the cab.

4.250 SMOOTH ALUMINUM REAR WALL - The rear wall will be smooth aluminum.

4.251 TOW EYES - Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the torque box. The inner and outer edges of the tow eyes will be radiused. There will be no garnish ring provided on either tow eye.

4.252 COMPARTMENTATION - Compartmentation will be fabricated of 0.125" 5052 aluminum. The side compartments are an integral assembly with the rear fenders. Fully enclosed rear wheel housings will be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load will be provided. The backbone of the support system will be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

4.252.1 A support system will be used which will incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators will have a broad range of proven viability in vehicular applications, be of a fail safe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in a 500 lb equipment rating for each lower compartment of the body.

4.252.2 The compartmentation in front of the rear axle will include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework will be mounted to the body above these support assemblies connected to the support assemblies with isolators. There will be one (1) support assembly mounted to each chassis frame rail.

4.252.3 The compartmentation behind the rear axle will include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly will be coated to isolate the dissimilar metals before it is bolted to the body. There will be one (1) support assembly mounted to each chassis frame rail.

4.252.4 Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. The compartment door openings are framed by flanging the edges in 1.75" and bending out again 0.75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum treadplate. Side compartment tops will be covered with bright aluminum treadplate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one (1) piece and have the corners welded. A bright aluminum treadplate cover will be provided on the front wall of each side compartment. All screws and bolts which protrude into a compartment will have acorn nuts at the ends to prevent injury.

4.252.5 The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.

4.253 AGGRESSIVE WALKING SURFACE - All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

4.254 LOUVERS - All body compartments will have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers will be formed into the metal and not added to the compartment as a separate plate.

4.255 ENGINEER COMPARTMENT - A transverse engineer compartment will be provided ahead of the water pump.

4.255.1 The compartment will be approximately 26.00" wide x cab height x 100.00" deep. The door opening will be approximately 23.00" wide. The width of the transverse section over the chassis frame rails will be reduced by 6.00" due to the boom support.

4.255.2 The compartment will be furnished with a roll-up door to match the door construction on the body.

4.255.3 The top of the compartment will be notched around the aerial device.

4.255.4 The compartment will [drip pan] below the roll of the door.

4.256 LEFT SIDE COMPARTMENTATION - A full height rollup door compartment, ahead of the rear wheels, will be provided. The compartment will be 41.75" wide x 64.00" high x 24.25" deep with a clear door opening of 38.75" wide x 56.38" high.

4.256.1 One (1) rollup door compartment will be located above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep with a clear door opening of 63.75" wide x 25.50" high.

4.256.2 The retracted rollup door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

4.256.3 A compartment with a single pan stainless steel lift up door will be located above the front stabilizer. The compartment will be 24.25" wide x 15.50" high x 24.25" deep with a door opening of 18.50" wide x 12.75" high. The compartment will have an aluminum treadplate cover with access to the top of the cord reel and will be extended above the catwalk to accommodate the reel. A top-hinged horizontal lift up stainless steel door will be provided with pneumatic cylinders for payout of the cord. The three (3) sides of the door opening will have stainless steel scuffplates.

4.256.4 A full height roll-up door compartment, behind the rear wheels, will be provided. The compartment will be 43.75" wide x 52.25" high x 21.25" deep with a door opening of 40.75" wide x 44.62" high.

4.256.5 There will be one (1) roll-up door compartment located below the turntable. The compartment will be 39.38" wide x 21.38" high x 21.25" deep with a door opening of 33.75" wide x 13.75" high.

4.256.6 The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

4.257 RIGHT SIDE COMPARTMENTATION - A full height rollup door compartment, ahead of the rear wheels, will be provided. The compartment will be 41.75" wide x 64.00" high x 24.25" deep with a clear door opening of 38.75" wide x 56.38" high.

4.257.1 One (1) rollup door compartment will be located above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep with a clear door opening of 63.75" wide x 25.50" high.

4.257.2 The retracted rollup door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

4.257.3 A compartment with a single pan stainless steel lift up door will be located above the front stabilizer. The compartment will be 24.25" wide x 15.50" high x 24.25" deep with a door opening of 18.50" wide x 12.75" high. The compartment will have an aluminum treadplate cover with access to the top of the cord reel and will be extended above the catwalk to accommodate the reel. A top-hinged horizontal lift up stainless steel door will be provided with pneumatic cylinders for payout of the cord. The three (3) sides of the door opening will have stainless steel scuffplates.

4.257.4 A full height roll-up door compartment, behind the rear wheels, will be provided. The compartment will be 43.75" wide x 52.25" high x 21.25" deep with a door opening of 40.75" wide x 44.62" high.

4.257.5 There will be one (1) roll-up door compartment located below the turntable. The compartment will be 39.38" wide x 21.38" high x 21.25" deep with a door opening of 33.75" wide x 13.75" high.

4.257.6 The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

4.258 SIDE COMPARTMENT ROLLUP DOORS -There will be ten (10) compartment doors installed on the side compartments, double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by amdor™ brand rollup doors.

4.258.1 Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

4.258.2 Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingression.

4.258.3 The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are must be manufactured utilizing non-marring materials.

4.258.4 Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

4.258.5 A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge must be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

4.258.6 All injection molded roll-up door wear components will be constructed of type 6 nylon.

4.258.7 Each roll-up door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

4.258.8 The header for the roll-up door assembly will not exceed 4.00".

4.258.9 A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

4.259 REAR BUMPER - An 8.00" rear bumper will be furnished. The bumper will be constructed of steel framework and will be covered with polished aluminum treadplate. The bumper will be 7.00" deep x 4.50" high and will be spaced away from the body approximately 1.00". The corners of the bumper will be angled at 30 degrees. It will extend the full width of the body.

4.260 DOOR GUARD - There will be ten (10) compartment doors that will include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed high as posible all comartments.

4.261 DOOR LATCHES - Southco model #c2-32-11 latches will be provided in place of standard latches. Six (6) latches will be provided. The latches will be provided aerial over-ride, compts ipo chute, the outrigger doors, stabilizer controls door. Black latches shall be used.

4.262 ROLLUP DOOR PULL STRAPS - Two (2) compartment doors will be provided with elastic pull straps. The straps will be 32.00" long and orange in color.

4.262.1 The straps will be located approximately mid height of the side compartment with a footman loop and installed directly to the inside of the rollup door.

4.262.2 The rollup door compartments to have these straps will be ls6 and rs6.

4.262.3 Painted smooth aluminum stabilizer door

4.263 COMPARTMENT LIGHTING - There will be ten (10) compartment(s) with two (2) led compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment. The dual light strips will be in compartment(s): all body compartments.

4.263.1 Any remaining compartments will include a single led compartment light strip.

4.263.2 Opening the compartment door will automatically turn the compartment lighting on.

4.263.3 There will be a covered metal clamp install 2.00" from each end and evenly spaced no less than 8.00" between the end clamps.

4.263.4 Additional compartment lighting.

4.263.5 There will be two (2) 9.00" white 12 volt dc led strip light(s) provided in the ls5 and rs5, mounted horizontal along the top compartment(s).

4.263.6 Opening the compartment door(s) will automatically turn the compartment lighting on.

4.263.7 Long item storage over pump

4.263.8 A transverse area over the pump and forward of the cargo area. This compartment will contain no partitions, location ..

4.263.9 A blister will be supplied at each side as needed to enclose the stored items due to their length.

4.263.10 The stored items will be accessible from either side of the vehicle through the aluminum treadplate door(s) with a southco raised trigger c2 chrome latch. The door will be hinged [hinge location].

4.263.11 The items to be stored will be ladder, little giant, type 1a, model 22. 22 ft.

4.264 MOUNTING TRACKS - There will be eight (8) sets of tracks for mounting shelf(s) in ls1, ls3, ls4, ls6, rs1, rs3, rs4 and rs6. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

4.265 ADJUSTABLE SHELVES - There will be ten (10) shelves with a capacity of 500 lb. provided. The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

4.265.1 Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

4.265.2 The shelves will be held in place by .12" thick stamped plated brackets and bolts.

4.265.3 The location(s) will be in rs1 centered between the floor and the ceiling, in rs3 centered between the floor and the ceiling, in rs4 centered between the floor and the ceiling, in rs4 in the upper third, in rs1 in the upper third, in ls1 centered between the floor and ceiling, in ls4 centered between the floor and ceiling, in ls4 in the upper third, in ls3 in the upper third and in ls1 in the upper third.

4.265.4 Transverse two (2) way slide-out multi-stop utility tray

4.265.5 There will be one (1) slide-out tray provided for use in the transverse side body compartment(s).

4.265.6 Each tray will be a utility style tray that is rated for up to 500 lb in the extended position. The bottom of each tray will be constructed of 0.19" thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends and tracks. The corners will be welded.

4.265.7 Each tray will have 3.00" high sides, will span the full depth of the transverse compartment and will be as wide as possible for the designated mounting location.

4.265.8 Each tray will be supported with a minimum of six (6) ball bearing rollers. Each tray will slide out two thirds (2/3) of its length to either side of the apparatus.

4.265.9 The tray will lock in the stowed, half-way, and fully extended positions. A release lever will be provided for releasing the tray with one (1) hand.

4.265.10 The vertical location of each tray within the compartment will be adjustable.

4.265.11 The tray(s) will be located above the floor mount tray in the upper portion d6 / p6.

4.265.12 Slide-Out Floor Mounted Tray - There will be four (4) floor mounted slide-out tray(s) provided ls1, ls4, rs1, rs4. A capacity rating will not be available on this tray due to a reduced side height being less than 2.00". The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior. The locking rod will be painted red 600t.

- **A.** The tray(s) will be designed for maximum compartment width and depth.
- **B.** The side height of the tray(s) will be as follows:
- **C.** Front: 2.00" high
- **D.** Rear: 4.00" high
- **E.** Left: 4.00" high
- **F.** Right: 4.00" high
- **G.** Slides will be equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.
- **H.** Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

4.265.13 Two-Way Utility Slide-Out Floor Mounted Tray - There will be one (1) floor mounted utility slide-out tray(s) provided ls6, rs6. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" thick aluminum for the tray bottom and sides. The corners will be welded. The finish will be painted to match compartment interior.

- **A.** The tray will be 4.00" high x full depth of the transverse compartment x as wide as possible for the compartment.
- **B.** The tray will operate with slide-master slides model sm2-d, 70% extension, 2-section, two-way slides.
- **C.** Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

4.265.14 Tool Board Added to Half Depth Slide-Out Tray - An aluminum tool board will be provided and mounted in a slide-out tray that is half the depth of a transverse compartment (tray not included). The tool board will be constructed of 0.19" thick aluminum that is painted spatter gray to match compartment interior. The tool board will be provided with 0.20" diameter holes in a pegboard pattern with 1.00" centers between holes. A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard.

- **A.** The tool board will span the full depth of the slide-out tray and will be as tall as possible for the specified mounting location.
- **B.** The tool board will be mounted on aluminum tracks to allow for side to side adjustment within the tray.
- **C.** The total capacity rating of the tool board will vary depending on the tray it is mounted in (capacity rating for the tool board will match the capacity rating of the tray it is mounted in).
- **D.** A total of two (2) tool board(s) will be provided and mounted in the slide-out tray(s) located ls6/rs6 on the upper 2 - way slide out tray, each tool board only half the depth of the tray, 36" tall.

4.265.15 Compartment In Place of Hose Chute - There will be two (2) compartment(s) located on the both sides side of the body at the rear in place of the hose chute. Each compartment will be approximately 10.00" wide x 16.00" high x 46.00" deep in the lower 14.00" of height and 22.75" deep in the upper 2.00" of height. Each compartment will have a smooth aluminum door, hinged on the inboard side with a flush southco c2 black powder coated latch on the outboard side.

4.265.16 Transverse Compartment Over Torque Box - One (1) upper forward body compartments will be transverse over the torque box, to the opposite side of the body. The transverse area will be 19.25" high x 68.00" deep and as wide as the compartments being transversed. The p3/d3 compartment will include this transverse option.

4.265.17 Retention Webbing - Webbing will be provided to retain compartment equipment from laying against the compartment door.

- **A.** The webbing will be located rs3.
- **B.** Each compartment door opening will be provided with a heavy black nylon webbing made of 2.00" nylon strap with a 2.00" box pattern. The nylon webbing will be permanently fastened at the bottom of the compartment and have seat belt buckle fasteners on the opposite side to secure it.

4.265.18 Vertical Compartment Partition - Two (2) partitions will be provided.

A. The partition construction will consist of .125" aluminum painted spatter gray. Each partition will be the full vertical height of the compartment.

B. The location(s) of this partition(s) will be even with the aerial boom support blister within the ls6 / rs6 compartments, fasten the partition with bolts and lock nuts, no self tapping screws. Connect top of partition to wall for stability compartment.

4.265.19 Floor extension - There will be a compartment floor extension provided. The floor extension will extend from the area over the frame rails to within an inch of the compartment door. The floor extension will have a downward 2.00" vertical lip and a 1.00" return flange. The floor extension will be made of .18" thick aluminum.

A. A total of two (2) will be provided and located engineer compartment each side.

4.266 REAR BUMPER - An 8.00" rear bumper will be furnished. The bumper will be constructed of steel framework and will be covered with polished aluminum treadplate. The bumper will be 7.00" deep x 4.50" high and will be spaced away from the body approximately 1.00". The corners of the bumper will be angled at 30 degrees. It will extend the full width of the body.

4.267 DOOR GUARD - There will be 11 compartment doors that will include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed High as possible in all compartments.

4.268 DOOR LATCHES - SouthCo model #C2-32-11 latches will be provided in place of standard latches. Two (2) latches will be provided. The latches will be provided on all stabilizer doors.

4.269 PULL STRAP, DOOR - There will be ten (2) compartment doors provided with pull straps. The compartment door(s) to be provided with a pull strap will be D6 and P6.

4.270 MECHANICAL DOOR OPEN SWITH - eight (8) compartment doors will have a mechanical switch. The single pan doors to have the mechanical switch will be (2) storage doors at rear, stabilizer control and override doors, (3) air pack and (1) double bottle compartments in rear fenders. The switch will be mounted on the hinge side in order to work effectively with a single pan door.

4.271 PAINTED SMOOTH ALUMINUM STABILIZER DOOR - The smooth aluminum door on the compartments above the front stabilizers will be painted job color. Each door will be provided with a Southco non-locking C2 black lever latch.

4.272 RUB RAIL - The bottom edge of the body panel will have a 2.00" high rubber rub rail the length of the body for protection.

4.273 BODY FENDER CROWNS - Black rubber fender crowns will be provided around the rear wheel openings.

4.274 EQUIPMENT STORAGE - A total of one (1) compartment(s) will be provided and located on the driver's side centered between the tandem rear wheels. The compartment(s) will be approximately 16.00" wide at the top x 8.00" wide at the bottom with tapered sides. The compartment(s) will be approximately 12.00" high x 26.00". Flooring will be rubber lined and have a drain hole.

4.274.1 A drop down door with support cables and a pair of Southco non-locking C2 black lever latches will be provided for each compartment. The door will be painted stainless steel. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

4.275 CORNER FENDER PANEL DOUBLE AIR BOTTLE STORAGE - A total of one (1) air bottle compartment will be provided in the upper corner(s) of the passenger side fender panel. The compartment(s) will be located on the passenger's side ahead of the rear wheel. The air bottle compartment(s) will be in the form of a round tube (7.75" diameter maximum) and of adequate depth (26.00" maximum) to accommodate different size air bottles. The tubes will be mounted separately in a diagonal fashion, one above the other.

4.275.1 Flooring will be rubber lined and have a drain hole. A triangular shaped vertically hinged door and a Southco non-locking C2 black lever latch will be provided for each compartment. The door will be painted stainless steel. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

4.276 FOUR AIR BOTTLE STORAGE COMPARTMENT - A total of one (1) air bottle compartment will be provided and located on the passenger's side centered between the tandem rear wheels. The air bottle compartment will consist of individual bins each designed to hold an air bottle with a maximum diameter of 7.63" and a maximum depth of 26.00".

4.276.1 Each compartment will hold a total of four (4) air bottles. The compartment will accommodate three (3) bottles across the top and one (1) centered below. The bottom air bottle will be accessible only when the top center bottle is removed and the hinged partition over the bottom bottle is lifted up. Each bottle will be separated by a partition.

4.276.2 Flooring will be rubber lined and have a drain hole. A drop down door with support cables with pair of Southco non-locking C2 black lever latches will be provided for each compartment. The door will be painted stainless steel. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

4.277 AIR BOTTLE COMPARTMENT STRAP -Straps will be provided in the air bottle compartment(s) to help contain the air bottles. The straps will wrap around the neck of each bottle and attach to the wall of the compartment.

4.278 AIR BOTTLE STORAGE - A total of two (2) air bottle compartments will be provided and located driver side rear, passenger side rear. The air bottle compartment will be in the form of a round tube, 7.63" diameter, and will be of adequate depth to accommodate different size air bottles. The flooring will be rubber lined and have a drain hole. A painted door with a Southco non-locking C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners (screws) and the body sheet metal.

4.279 AIR BOTTLE STORAGE (Single) -A quantity of one air bottle compartment, approximately 7.50" wide x 7.50" tall x 26.00" deep, will be provided on the driver side forward of the rear wheels. The triangular door will cover the air bottle opening and the DEF tank access. The compartment will be square with angled corners. A painted stainless steel door with a Southco non-locking C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black rubber matting will be provided.

4.280 AIR BOTTLE COMPARTMENT STRAP - A strap will be provided in the air bottle compartment to help contain the air bottle when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.

4.281 EXTENSION LADDER - There will be one (1) 35' two (2) section aluminum Duo-Safety Series 1200-A extension ladder(s) provided.

4.282 AERIAL EXTENSION LADDER - There will be one (1) 28' two (2) section aluminum Series 900-A extension ladder(s) provided and located in the aerial torque box.

4.283 ROOF LADDERS - There will be two (1) 16' aluminum Duo-Safety Series 875-A roof ladders provided.

4.284 ADDED ROOF LADDER - There will be one (1) 20' roof, aluminum, Series 875-A provided.

4.285 AERIAL ATTIC EXTENSION LADDER - There will be one (1) 14' Fresno aluminum Duo-Safety Series 701 attic extension ladder(s) provided.

4.286 AERIAL FOLDING LADDER - There will be one (1) 10' aluminum Duo-Safety Series 585-A folding ladder(s) provided and located in the aerial torque box.

4.287 GROUND LADDER STORAGE - The ground ladders are stored within the torque box and are removable from the rear.

4.287.1 Ladders will be enclosed to prevent road dirt and debris from fouling or damaging the ladders.

4.287.2 The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.

4.287.3 An AMDOR rollup door will be provided at the rear, double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by AMDOR manufacturing. The latching mechanism will consist of a full length lift bar lock with latches on the outer extrusion of the door frame.

4.287.4 A stainless plate with a two bend flange and a stainless steel hinge will be provided to secure the aerial ladder complement. The plate assembly will be mounted to the bottom of the entrance of the torque box ladder storage area.

4.287.5 When the plate is vertical, it will secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down and not securing the ladders, the roll-up door cannot close, which will activate the "Open Door Indicator Light" within the cab. The roll-up door together with hinge friction will secure the plate in place during driving operations.

4.287.6 A door guard will be provided to prevent tools inside the torque box from damaging the roll-up door.

4.288 LADDER STORAGE LIGHTING - there will be two (2) truck lite model 44042c, 4.00" white led lights with model 40700, grommets used to illuminate the torque box ladder storage compartment. One (1) each side will be located on the side wall of the torque box near the ladder storage entry area.

4.288.1 The lights will be activated when the ladder storage compartment door is opened.

4.289 DURA-SURF LADDER SLIDES - Black Dura-Surf friction reducing material will be added to the stainless steel slides, on the bottom horizontal surfaces, of the ladder storage rack.

4.290 EQUIPMENT STORAGE - An aluminum trough will be provided in the torque box for the storage of equipment. The "U" shaped trough shall be TBD.

4.291 4' PIKE POLE - 1 pike pole Fire Hooks Unlimited RH 4' New York style hook with D-handle will be provided and located TBD.

4.292 6' PIKE POLE - Four (4) pike poles, Fire Hooks Unlimited, Model RH6, 6' long roof hook, with a steel handle and chisel end will be provided and located TBD.

4.293 8' PIKE POLE - There will be One (1) pike pole Fire Hooks Unlimited, Model RH-8, 8' pike pole(s) with steel handle and gas shut off end provided. The pike pole(s) will be stored in tubular holders located TBD.

4.294 8' PIKE POLE - One (1) pike pole, Fire Hooks Unlimited, Model RH 8, 8' long roof hook, with a steel handle and chisel end will be provided and located TBD.

4.295 ADDITIONAL PIKE POLE - There will be one (1) 8' long pike pole(s), Fire Hooks Unlimited NYFG-8, with steel handle(s) and pry end provided Aerial fly section.

4.296 PIKE POLE STORAGE - Aluminum tubing will be used for the storage of three (3) pike poles and will be located in the aerial torque box. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

4.297 PIKE POLE STORAGE - Aluminum tubing will be used for the storage of three (3) pike poles and will be located torque box, the 8 eight foot- option- 680352, (2) two 6 foot-option557255. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided. The pike pole tube will be notched to allow a New York style pike pole to fit into the tube.

4.298 LABELS AND TAGS - one (1) ID label/tag will be provided. The label/tag will be black colored with contrasting lettering. The label/tag will be located AT THE REAR ABOVE AERIAL INLET LABEL and sized appropriately for the specified location(s). The label/tag will state the following "TEST ONLY".

4.299 AIR HORN SYSTEM - Two (2) Buell air horns will be recessed in the front bumper. Models 1062 and 1063 shall be provided. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

4.300 Air Horn Location - The air horns will be located on each side of the bumper, towards the outside.

4.301 AIR HORN CONTROL - The air horns will be actuated by a chrome push button located on the officer's side of the engine tunnel, foot switch on drivers side and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

4.302 ELECTRONIC SIREN - A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided. This siren must be active when the battery switch is on and that emergency master switch is on. Electronic siren head will be recessed in the overhead console above the engine tunnel on the driver side.

4.303 SIREN CONTROL - The electronic siren will be controllable on the siren head and horn ring only. No foot switches will be required. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

4.304 SPEAKERS - There will be two (2) Whelen Projector™ Series, Model SA314A, 100-watt, cast aluminum speakers with natural finish provided. Each speaker will be connected to the siren amplifier. The speakers will be recessed in each side of the front bumper, just outside of the frame rails.

4.305 AUXILIARY MECHANICAL SIREN - A Federal Q2B® siren will be furnished. A siren brake button will be installed on the switch panel. The control solenoid will be powered up after the emergency master switch is activated. The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.

4.306 MECHANICAL SIREN CONTROL - The mechanical siren WIll be actuated by a push button located on the officer's side instrument panel and by a foot switch on the driver's side. A second siren brake switch will be installed on the officer side engine tunnel area. The switch will be a chrome push button style.

4.307 BELL - a chrome plated, 12.00" bronze cast bell, complete with an eagle, will be mounted through the center of the grille. The bell will be mounted on a flat, saddle welded bracket. The bracket will come out from the round tube on the center of the cab located behind the grille and extend straight out for the bell mounting. The bracket will be painted black.

4.307.1 A rope pull for the bell will be installed inside the cab.

4.308 SLIDE-OUT/FOLD-OUT PLATFORM - one (1) slideout platform will be provided on the right side. The platform will have a pull out, flip down design. The front edge and top surface of the platform will be made of da finished aluminum. There will be a Morton Cass insert provided on the stepping surface.

4.308.1 The platform will be approximately 13.75" deep when in the stowed position and approximately 21.75" deep when extended. The capacity rating will be 500 lb in the extended position. The platform will be for a 42.00" wide pump house providing a 35.00" wide step assembly with a 34.38" wide stepping surface. The platform will lock in the retracted and extended position.

4.308.2 There will be [light, long step] white 12 volt dc led light provided to illuminate the ground area.

4.309 PUMP - Pump will be a Waterous CSU, 2000 gpm single (1) stage midship mounted centrifugal type.

4.309.1 Pump will be the class "a" type.

4.309.2 Pump will deliver the percentage of rated discharge at pressures indicated below:
a.- 100% of rated capacity at 150 psi net pump pressure.
b.-70% of rated capacity at 200 psi net pump pressure.
c. -50% of rated capacity at 250 psi net pump pressure.

4.309.3 Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

4.309.4 Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

4.309.5 Pump case halves will be bolted together on a single horizontal face to minimize a chance of leakage and facilitate ease of reassembly. No end flanges will be used.

4.309.6 Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

4.309.7 The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

4.309.8 Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

4.309.9 Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

4.309.10 Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.

4.309.11 The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.

4.309.12 In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.

4.309.13 Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

4.310 PUMP TRANSMISSION - The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength morse hy-vo silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

4.310.1 Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.

4.311 PUMPING MODE - An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

4.312 AIR PUMP SHIFT - Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab.

4.312.1 Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "ok to pump".

4.312.2 The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

4.312.3 The pump shift control in the cab will be illuminated to meet NFPA requirements.

4.313 TRANSMISSION LOCK-UP - The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.

4.314 AUXILIARY COOLING SYSTEM - A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.

4.315 INTAKE RELIEF VALVE - One (1) trident air max intake relief valve(s) will be installed on the suction side of the pump preset at 125 psig.

4.315.1 The relief valve will have a working range of 50 psi to 350 psi.

4.315.2 The outlet will terminate below the frame rails with a 2.50" national standard hose thread adapter and will have a "do not cap" warning tag.

4.315.3 One (1) adjustable air regulator and pressure indicating gauge will be located on a common bezel on the left side pump panel to control the intake valve(s).

4.316 PRESSURE GOVERNOR - This apparatus will be equipped with a class1 "total pressure governor" engine/pump governor/throttle system that is connected directly to the electronic control module (ecm) mounted on the engine. The "total pressure governor" is to operate as a pressure sensor (regulating) governor (psg).

4.316.1 A special preset feature will permit a predetermined pressure of rpm to be set. The preset pressure or rpm will be displayed on the message display of the "total pressure governor". The preset will be easily adjustable by the operator

4.316.2 The pressure sensor governor system will be operable only after the vehicle parking brake has been set, the transmission is the pumping mode, and the fire pump has been engaged.

4.316.3 The pressure sensor governor system will have two (2) modes of operation: pressure mode or rpm mode.

4.316.4 When in the pressure mode, the psg system will automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).

4.316.5 In the rpm mode, the psg system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).

4.316.6 A pump cavitation protection feature will be provided which will return the engine to idle should the pump cavitate.

4.316.7 The pressure controller will incorporate monitoring for engine coolant temperature, oil pressure, and battery voltage.

4.317 PRIMING PUMP - The priming pump will be a trident emergency products compressed air powered, high efficiency, multistage venturi based airprime system, conforming to standards outlined in the current edition of NFPA 1901.

4.317.1 All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

4.317.2 One (1) priming control will open the priming valve and start the pump primer.

4.317.3 Light, additional, for thermal relief valve

4.317.4 A two (2) of 2" diameter Whelen model t0b00fbr blue led grommet mounted lights, will be provided in addition to the standard light for indication when the thermal relief valve is operating.

4.317.5 Lights will be located in each side of the pump panel , upper area of dunnage area match 32241, center the sign below the light.

4.317.6 These lights will be activated with the main thermal valve indicator light on the pump panel.

4.318 PUMP DRAIN TUBING - The master pump drain will not use copper tubing. Install nylon tubing for the pump drain lines between the valves and the drain. Use hose clamps where ever necessary to allow proper line drainage.

4.319 THERMAL RELIEF VALVE - A hale trv170-l thermal protection device will be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 170 degrees f (77 c).

4.319.1 The thermal protection device will include a red warning light and audible alarm. The warning light with a test switch will be mounted on the pump operator panel.

4.319.2 The discharge line will be 3/8 inch diameter tubing plumbed to ground.

4.320 PUMP MANUALS - There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

4.321 PLUMBING, STAINLESS STEEL AND HOSE - All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

4.321.1 Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

4.321.2 Plumbing manifold bodies will be ductile cast iron or stainless steel.

4.321.3 All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

4.321.4 All water carrying gauge lines will be of flexible polypropylene tubing.

4.321.5 All piping, hose and fittings will have a minimum of a 500 psi hydrodynamic pressure rating.

4.322 MAIN PUMP INLETS - A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

4.322.1 Main pump inlet cap provided by fire department

4.322.2 NFPA 1901, 2016 edition, section 16.6.8 requires all intakes to be provided with caps or closures capable of withstanding a hydrostatic gauge pressure of 500 psi.

4.322.3 The caps are not on the apparatus as manufactured. The fire department will provide both caps for the main pump inlets.

4.323 HIGH FLOW BALL INTAKE VALVE - Task force tips model #axd1st-nx-f manually operated lightweight aluminum high flow straight inlet ball intake valve will be provided. The unit will be equipped with an adjustable pressure relief valve under the main valve body. The valve will be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A 3/4" bleeder valve will be provided to exhaust excess air or water from the valve and hose line. A position indicator will be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting will be hard coat anodized, with a powder coat internal and external finish and all components typically facing the wet side of the valve will be constructed from stainless steel.

4.323.1 The connections will be: 5.00" storz swivel fitting and a 6.00" female nh threaded swivel connection and include polymer bearing strips for prevention of galvanic corrosion. A 5.00" storz cap will be included.

4.323.2 Two (2) inlet valves will be provided on both the driver's side and the passenger's side main pump inlets.

4.324 VALVES - All ball valves will be akron® brass. The akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

4.324.1 Valves will have a ten (10) year warranty.

4.324.2 Not required, left side inlet

4.324.3 NFPA 1901, 2016 edition, section 16.6.3 requires at least one (1) valved intake will be provided that can be controlled from the pump operator's position.

4.324.4 This apparatus does not have a valved intake as manufactured.

4.325 ANODE, INLET - A pair of sacrificial zinc anodes will be provided in the water pump inlets to protect the pump from corrosion.

4.326 LEFT SIDE DISCHARGE OUTLETS - There will be one (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (m) national standard hose thread adapter.

4.327 RIGHT SIDE DISCHARGE OUTLETS - There will be one (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (m) national standard hose thread adapter.

4.327.1 There will be a 4.00" discharge outlet with a 3.00" valve with a 3.00" ball, installed on the right side of the apparatus, terminating with a 4.00" (m) national standard hose thread adapter. This discharge outlet will be actuated with a handwheel control with position indicator at the pump operator's control panel.

4.328 DISCHARGE CAPS/ INLET PLUGS - Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

4.328.1 Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

4.328.2 The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected.

4.329 OUTLET BLEEDERS - A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

4.329.1 The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

4.329.2 No snubber drain valves are acceptable.

4.330 LEFT SIDE OUTLET ELBOWS - The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (f) national standard hose thread x 2.50" (m) national standard hose thread, chrome plated, 45 degree elbow.

4.330.1 The elbow will be pierce vlh, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

4.331 RIGHT SIDE OUTLET ELBOWS - The 2.50" discharge outlets located on the right side pump panel will be furnished with a 2.50" (f) national standard hose thread x 2.50" (m) national standard hose thread, chrome plated, 45 degree elbow.

4.331.1 The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

4.332 ADDITIONAL RIGHT SIDE OUTLET ELBOWS - The 4.00" discharge outlets, located on the right ride pump panel, will be furnished with a 4.00" (f) national standard hose thread x 5.00" storz, elbow.

4.333 DISCHARGE OUTLET CONTROLS - The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

4.333.1 If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

4.333.2 Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 16.7.5.3.

4.334 AERIAL OUTLET - The aerial waterway will be plumbed from the pump to the water tower line with 5.00" pipe and a 4.00" akron valve. The handwheel control for the waterway valve will be located at the pump operator's panel.

4.334.1 An indicator will be provided to show the position of the valve.

4.334.2 The following drawing(s) will be provided for approval by the City. The drawing(s) will be made to match match the approved pump panel drawings and 31672. Do not mount the sonalert on the panel, mount in the gauge cluster panel similar pierce job number.

4.335 PUMP OPERATOR'S PANEL DRAWING - A detailed drawing to scale of the pump operator's panel will be provided for City to review. The drawing will include all of the gauges, controls, switching, etc., located on the pump operator's panel. The City will be allowed to make changes and/or mark-ups to this approval drawing. The fire apparatus manufacturer will make revisions (if needed) to the drawing per the City changes and/or mark-ups as long as the changes are physically possible within a specific product line.

4.335.1 The finalized and signed City approved pump operator's panel drawing will become part of the contract documents.

4.335.2 Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will not be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.

4.336 REMAINING PUMP PANEL(S) - Detailed drawing(s) to scale of the remaining pump panel(s) will be provided for the City to review. The drawing(s) will include all of the gauges, controls, switching, etc., located on the pump panel(s). The City will be allowed to make changes and/or mark-ups to these approval drawing(s). The fire apparatus manufacturer will make revisions (if needed) to the drawing(s) per the City changes and/or mark-ups as long as the changes are physically possible within a specific product line.

4.336.1 The finalized and signed City approved pump panel drawing(s) will become part of the contract documents.

4.336.2 Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will not be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.

4.337 COLOR CODED TAGS - A detailed drawing/chart of the colors used on all of the inlet(s) and outlet(s) will be provided for the City to review. The City will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (if needed) to the drawing per City's changes and/or mark-ups as long as the changes are physically possible within a specific product line.

4.337.1 The finalized and signed City approved drawing/chart of the colors will become part of the contract documents.

4.338 SPECIAL TEXT/VERBIAGE TAGS - A detailed drawing/chart of the text/verbiage used on all of the inlet(s) and outlet(s) will be provided for the City to review. The City will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (if needed) to the drawing per City's changes and/or mark-ups as long as the changes are physically possible within a specific product line.

4.338.1 The finalized and signed City approved drawing/chart of the text/verbiage will become part of the contract documents.

4.339 PUMP COMPARTMENT - The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. The pump compartment will be constructed of the same material as the body compartmentation.

4.339.1 The pump compartment substructure will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

4.339.2 The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

4.339.3 Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

4.340 PUMP MOUNTING - Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

4.341 LEFT SIDE PUMP CONTROL PANELS - All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

4.341.1 Layout of the pump control panel will be ergonomically efficient and systematically organized.

4.341.2 The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

4.341.3 The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

4.341.4 The lower section of the panel will contain all inlets, outlets, and drains.

4.341.5 All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

4.342 IDENTIFICATION TAGS - The identification tag for each valve control will be recessed in the face of the tee handle.

4.342.1 All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

4.342.2 All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

4.342.3 All remaining identification tags will be mounted on the pump panel in chrome plated bezels.

4.342.4 The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

4.342.5 Trim rings will be installed around all inlets and outlets.

4.343 PUMP PANEL CONFIGURATION - The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

4.344 PUMP OPERATOR'S PLATFORM - A pull out, flip down platform will be provided at the pump operator's control panel.

4.344.1 The front edge and the top surface of the platform will be made of da finished aluminum with a Morton Cass insert.

4.344.2 The platform will be approximately 13.75" deep when in the stowed position and approximately 22.00" deep when extended. The platform stepping surface will be 35.00" wide. The platform will lock in the retracted and the extended position.

4.344.3 The platform will be wired to the "step not stowed" indicator in the cab.

4.345 PUMP OPERATOR'S PLATFORM PERIMETER LIGHT - There will be an Amdor, model ay-lb-12hw020, 350 lumens each, 20.00" white 12 volt dc led strip light provided to illuminate the ground area.

4.346 PUMP AND GAUGE PANEL - The pump and gauge panels will be constructed of aluminum with a black vinyl finish. A polished aluminum trim molding will be provided around each panel.

4.346.1 The right side pump panel will be removable and fastened with swell type fasteners.

4.347 PUMP COMPARTMENT LIGHT - A pump compartment light will be provided inside the right-side pump enclosure and accessible through a door on the pump panel.

4.347.1 A .125" weep hole will be provided in each light lens, preventing moisture retention.

4.348 PUMP PANEL GAUGES AND CONTROLS - The following will be provided on the pump and gauge panels in a neat and orderly fashion. These gauges will be in addition to what is provided with the pressure controller.

4.348.1 engine oil pressure gauge: with visual and audible warning
4.348.2 engine water temperature gauge: with visual and audible warning
4.348.3 tachometer: electric
4.348.4 master pump drain control
4.348.5 voltmeter
4.348.6 fuel
4.348.7 Throttle ready green indicator light
4.348.8 There will be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.

4.349 OK TO PUMP INDICATOR LIGHT - There will be a green indicator light installed on the pump operators panel that is activated when the pump is in ok to pump mode.

4.350 PUMP ACCESS DOOR LATCHES - Two (2) pump access door(s) will be provided with southco non-locking c2 latches to hold the doors in the closed position in place of standard.

4.350.1 Latch(es) will be provided with on the pump access door(s) located driver and passenger side access door

4.351 HANDWHEEL OUTLET CONTROLS - The control for one (1) will be 6.25" handwheel control with indicators. The control will include all u-joints with rubber coverings. The discharge outlets with handwheels will be ps ldh.

4.352 PUMP PANEL INFORMATION - The screw in 140 degree temp switch for option 764348 shall be mounted in a port away from the engine cooler tubing.

4.353 VACUUM AND PRESSURE GAUGES - The pump vacuum and pressure gauges will be liquid filled and manufactured by class 1 incorporated ©.

4.353.1 The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.
4.353.2 The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.
4.353.3 Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. Standard pipe thread connections and polished stainless steel plugs. They will be marked with a label.

4.354 PRESSURE GAUGES - The individual "line" pressure gauges for the discharges will be interlube filled and manufactured by class 1©.

4.354.1 The gauges will be a minimum of 3.00" in diameter and will have white faces with black lettering.

4.354.2 Gauge construction will include a zytel nylon case with adhesive mounting gasket and threaded retaining nut.

4.354.3 Gauges will have a pressure range of 30"-0-400#.

4.354.4 The individual pressure gauge will be installed as close to the outlet control as practical.

4.354.5 This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

4.355 STEP/LIGHT SHIELD - There will be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operator's panel.

4.355.1 There will be 12 volt dc white led lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.

4.355.2 One (1) pump panel light will come on when the pump is in ok to pump mode.

4.355.3 There will be a light activated above the pump panel light switch when the parking brake is applied. This is to afford the operator some illumination when first approaching the control panel.

4.355.4 There will be one (1) white led, step light provided above this step. In order to ensure exceptional illumination, each step light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The step light will be activated by the pump panel light switch.

4.356 ADDITIONAL STEP/LIGHT SHIELD - There will be an additional aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the passenger's side pump panel.

4.356.1 There will be 12 volt dc white led lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.

4.356.2 There will be one (1) white led, step light provided above the step. In order to ensure exceptional illumination, each step light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The step light will be activated by the pump panel light switch.

4.357 RUNNING BOARDS – The running boards will be fabricated of 0.125" bright aluminum treadplate and supported by structural steel angle assemblies bolted to the chassis frame rails with the following requirements:

4.357.1 Running boards will be 14.75" deep and are spaced away from the body 0.50". The rear outside corner or the running board will be finished with a 45 degree corner to match it up with the body width.

4.357.2 A splash guard will be provided to keep road dirt or water from splashing up onto the pump panels.

4.357.3 The running boards will have a riser on the body to protect the painted surface from damage by stepping on the running boards.

4.357.4 The entire surface of the running boards will be covered with bright aluminum treadplate.

4.358 LADDER STORAGE – A completely enclosed compartment will be provided for a 14" 701 ladder between the torque box and the PS side body compartment. This compartment will be in place of hose chute. There will be a smooth aluminum door at the rear with a D-handle latch.

4.358.1 Two (2) additional folding steps will be located one (1) on the driver side front bulkhead and one (1) on the passenger side front bulkhead. The step(s) will be bright finished, non-skid with a black coating. Each step will incorporate an LED light to illuminate the stepping surface. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

4.359 STIRRUP STEPS WITH TREAD GRIP - There will be one (1) stirrup style steps with cable hanger and tread grip rung provided. The step will be installed under the PS pump panel in place of the stirrup step that is used as standard.

4.360 FRONT ZONE UPPER WARNING LIGHTS - there will be eight (8) Whelen® flashing led warning lights with chrome trim mounted on boxes with removable covers on the cab roof.The lights will be configured per the following:

4.360.1 One (1) model 6rbr* 4.18" high x 6.56" long x 3.43" deep light with red leds flashing in a semi circle pattern in the driver's side, outside rear position.

4.360.2 One (1) model 6rbb* 4.18" high x 6.56" long x 3.43" deep light with blue leds flashing in a semi circle pattern in the driver's side, outside middle position.

4.360.3 One (1) model 6rbr* 4.18" high x 6.56" long x 3.43" deep light with red leds flashing in a semi circle pattern in the driver's side, outside front position.

4.360.4 One (1) model m6r* 4.31" high x 6.75" long x 1.37" deep light with red flashing leds in the driver's side front position.

4.360.5 One (1) model m6r* 4.31" high x 6.75" long x 1.37" deep light with red flashing leds in the passenger's side front position.

4.360.6 One (1) model 6rbr* 4.18" high x 6.56" long x 3.43" deep light with red leds flashing in a semi circle pattern in the passenger's side, outside front position.

4.360.7 One (1) model 6rbb* 4.18" high x 6.56" long x 3.43" deep light with blue leds flashing in a semi circle pattern in the passenger's side, outside middle position.

4.360.8 One (1) model 6rbr* 4.18" high x 6.56" long x 3.43" deep light with red leds flashing in a semi circle pattern in the passenger's side, outside rear position.

4.360.9 The lens color(s) must be clear.

4.360.10 There will be a switch in the cab on the switch panel to control the flashing leds.

4.360.11 The flashing leds in the front positions will be activated when the aerial device is raised out of the stowed position.

4.360.12 The flashing leds in the rear and middle positions may be load managed when the parking brake is applied.

4.361 FRONT ZONE UPPER LIGHTING, PLATFORM: There will be three (3) Whelen®, model 6rb**, 4.18" high x 6.56" long x 3.43" deep, flashing in a semi circle pattern led lights with chrome trim located at the front of the platform basket facing forward per the following:

4.361.1 The left side outside warning light to include red leds

4.361.2 The center light to include blue leds

4.361.3 The right side outside warning light to include red leds

4.361.4 There will be a switch in the cab on the switch panel to control the lights. The lights will be deactivated when the aerial device is lifted from the stowed position.

4.362 ADDITIONAL WARNING LIGHTS: There will be two (2) Whelen, model 6rb**, 4.19" high x 6.56" long x 3.44" deep led flashing in a semi circle warning light(s) with chrome flange, located on the basket, side of basket.

4.362.1 The color of these lights will be red. The lens will be clear.

4.362.2 There will be a switch in the cab on the switch panel to activate these lights. The lights will be deactivated when the aerial device is lifted out of the boom support.

4.362.3 The additional warning light(s) may be load managed if colored or will be deactivated if white, when the parking brake is applied.

4.363 ADDITIONAL WARNING LIGHTS: There will be two (2) Whelen, model m7* led flashing warning light(s) that include a chrome flange, located on the basket, front corners of the basket side.

- **4.363.1** The color of these lights will be blue and include a lens that is clear.
- **4.363.2** The light(s) will be activated with the roof light switch and be deactivated when the boom is lifted out of the cradle.
- **4.363.3** The additional warning light(s) may be load managed if colored or will be deactivated if white, when the parking brake is set.

4.364 TRAFFIC LIGHT CONTROLLER - There will be a GTT, Model 792* strobe Opticom traffic light controller with national standard high priority remote mounted on the front edge of the platform basket. The Opticom traffic light controller will be activated by a cab switch with emergency master control. The Opticom traffic light controller will have no momentary activation switch. The Opticom traffic light controller will be disabled when the parking brake is applied.

4.365 COVER, TRAFFIC LIGHT CONTROLLER - There will be an aluminum treadplate cover provided over the Opticom traffic light controller for protection.

4.366 CAB FACE WARNING LIGHTS - There will be two (2) Whelen, Model M6*C, LED flashing warning lights with chrome flange provided on the front of the cab above the headlights.

- **4.366.1** The driver's side front warning light must be blue.
- **4.366.2** The passenger's side front warning light must be blue.
- **4.366.3** Both lights will include a clear lens.
- **4.366.4** There will be a switch located in the cab on the switch panel to control the lights.

4.367 FRONT WARNING LIGHT - There will be two (2) Whelen, Model M6*, LED flashing light(s) with chrome trim provided below the headlights as shown on the drawing.

- **4.367.1** The color of the light(s) will be red.
- **4.367.2** The color of the lens will be clear.
- **4.367.3** The light(s) will be activated with the front warning switch.
- **4.367.4** These lights may be load managed if colored or disabled if white when the parking brake is applied.
- **4.367.5** Any white light will be disabled and any amber light activated when the parking brake is applied.

4.368 SIDE ZONE LOWER LIGHTING - There will be six (6) Whelen®, flashing LED warning lights with chrome trim installed per the following:

- **4.368.1** Two (2) Model 6RB**, 4.18" high x 6.56" long x 3.43" deep lights flashing in a semi circle pattern, one (1) each side on the front cab corner. The side front warning LEDs must be red.
- **4.368.2** Two (2) Model M6**, 4.31" high x 6.75" long x 1.37" deep lights, one (1) each side of cab rearward of crew cab doors. The side middle LEDs must be blue.
- **4.368.3** Two (2) Model M6**, 4.31" high x 6.75" long x 1.37" deep lights, one (1) each side on the rear fender panel. The side rear LEDs must be blue.
- **4.368.4** The warning light lens color(s) must be clear.

4.369 INTERIOR CAB DOOR WARNING LIGHTS - There will be four (4) Weldon, Model 8401-0000-20, amber 12 volt DC LED flashing strip lights provided.

- **4.369.1** One (1) light on the driver's side cab door over the window.
- **4.369.2** One (1) light on the passenger's side cab door over the window.
- **4.369.3** One (1) light on the passenger's side crew cab door over the window.
- **4.369.4** One (1) light on the driver's side crew cab door over the window.
- **4.369.5** Each light will be activated when the battery switch is on and the adjacent door is opened.
- **4.369.6** Each light will be installed so the flash pattern directs traffic away from the doors.

4.370 ADDITIONAL SIDE UPPER LIGHTS - There will be six (6) Whelen, Model M4**, 3.38" high x 5.50" long x 1.38" deep LED surface mount flashing lights with chrome trim provided on the outside corner radius of the cab roof over the crew cab doors.

- **4.370.1** The side front lights must be red.
- **4.370.2** The side middle lights must be blue.
- **4.370.3** The side rear lights must be red.
- **4.370.4** The color of the lenses will be clear.
- **4.370.5** The lights will be installed on two (2) painted bracket that are attached to the cab roof. Three (3) lights on the driver's side and three (3) lights installed on the passenger's side.
- **4.370.6** There will be a switch in the cab on the switch panel to control the lights.

4.371 SIDE WARNING LIGHTS - There will be two (2) Whelen, Model WIONSMC* LED light(s) provided and located centered over D4 / P4, on the side of the catwalk. The color of each light will be blue LED with a clear lens. Each light will be provided with a chrome plated ABS flange. The light(s) will be activated with the side warning switch.

4.372 SIDE WARNING LIGHTS - There will be two (2) Whelen, Model WIONSMC* LED light(s) provided and located centered above D2/P2 on the catwalk.

- **4.372.1** The color of each light will be red LED with a clear lens.
- **4.372.2** Each light will be provided with a chrome plated ABS flange.
- **4.372.3** The light(s) will be activated with the side warning switch.

4.373 REAR ZONE LOWER LIGHTING - There shall be two (2) Whelen®, Model M6*C, LED flashing warning lights located at the rear of the apparatus.

- **4.373.1** The driver's side rear light must be red
- **4.373.2** The passenger's side rear light must be red
- **4.373.3** Both lights will include a lens that is clear.
- **4.373.4** There will be a switch located in the cab on the switch panel to control the lights.

4.374 REAR WARNING LIGHTS - There will be two (2) Whelen®, Model 6RB**, LED flashing warning light(s) with Whelen, Model 6EFLANG, chrome flange(s) provided centered below the rear scene light, on the rear wall.

- **4.374.1** The color of the lights will be blue.
- **4.374.2** The color of the lens of the light(s) will be clear.
- **4.374.3** These lights will be activated with the rear upper warning switch.

4.375 REAR OF HOSE BED WARNING LIGHTS - There will be two (2) Whelen Rota-Beam, Model R3165F, 4.00" high x 7.19" wide beacons with red LED's and clear domes provided.

- **4.375.1** One (1) will be installed on the driver's side rear of the apparatus.
- **4.375.2** One (1) will be installed on the passenger's side rear of the apparatus.
- **4.375.3** There will be a switch located in the cab on the switch panel to control the beacons.

4.376 TRAFFIC DIRECTING LIGHT - There will be one (1) Whelen® Model TAM85, 46.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

- **4.376.1** The Whelen Model TACTL5 control head will be included with this installation.
- **4.376.2** The auxiliary warning mode will be activated with the control head only.
- **4.376.3** This traffic directing light will be mounted on top of the body below the turntable at the rear of the apparatus.
- **4.376.4** The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the passenger's side.

4.377 ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT -The following guidelines will apply to the 120/240 VAC system installation:

4.377.1 General

A. Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

B. Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

c. Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

4.377.2 Grounding

A. Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

B. An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

C. The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

D. In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

e. All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

4.377.3 Operation - Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

4.377.4 Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

4.377.5 A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the information detailed in Figure 19-4.10.

4.377.6 Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

4.377.7 Overcurrent protection - The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.

A. For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).

B. For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

4.377.8 Wiring Methods

A. Fixed wiring systems will be limited to the following:

B. Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)

C. or

D. Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

E. Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows.

F. Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping

G. Separated from fuel lines by a minimum of 6.00" (152 mm) distance

H. Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

4.377.9 Wiring Identification - All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.

4.377.10 Wet Locations - All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

A. All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.

B. The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

4.377.11 Dry Locations

A. All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.

B. All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked.

4.377.12 Listing - All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

4.377.13 Electrical System Testing

A. The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

B. The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

C. Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

4.377.14 Operational Test per Current NFPA 1901 Standard

A. The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization.

B. The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

C. The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

D. Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

4.378 GENERATOR

4.378.1 The apparatus will be equipped with a complete AC (alternating current) electrical power system. The generator will be a Harrison, Model 10.0MAS-16R/D-11011/15/1, 10,000 watt hydraulic driven unit.

4.378.2 The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor.

4.378.3 The hydraulic engagement supply will be operational at any time (no interlocks).

4.378.4 An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

4.378.5 Generator Instruments and Controls - To properly monitor the generator performance a digital meter panel will be furnished and mounted near the circuit breaker panel.

4.379 GENERATOR LOCATION - The generator will be mounted in the in the area over the pump in the center. The flooring in this area will be either reinforced or constructed in such a manner that it will handle the additional weight of the generator.

4.380 GENERATOR START - There will be a switch provided on the cab instrument panel to engage the generator.

4.381 CIRCUIT BREAKER PANEL - The circuit breaker panel will be located high on the forward wall of compartment D4.

4.382 SPARE CIRCUIT BREAKER - The circuit breaker panel will be furnished with two (2) circuit breakers, 120 volt 20 amp, provided as spares.

4.383 DIGITAL METER PANEL - The generator meter panel will be installed [Location] in place of the standard location. The digital meter panel will be on anytime the generator is running (no green indicator light is required).

4.384 120 VOLT LIGHTING - There will be two (2) Fire Research, Model SPAKR700-K20-ON-HD-***, 120 volt AC 20,000 Lumens LED light(s) with switch, ground base and quick release truck mount brackets provided to be determined. The painted parts of this light assembly must be white with a white bezel. There will be a 30 amp, 120 volt twist lock plug included with each light selected.

4.385 ELECTRIC CORD REEL - Furnished with the 120-volt AC electrical system will be an Akron cord reel. The reel will be provided with a 12-volt electric rewind switch that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

4.385.1 The reel will be capable holding 12/3, 600-volt cable or 10/3, 600-volt cable.

4.385.2 The exterior finish of the reel(s) will be powder coated silver from the reel manufacturer.

4.385.3 A Nylatron guide must be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

4.385.4 A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

4.385.5 A total of two (2) cord reels will be provided one (1) reel in the driver's side front compartment over the driver's side front stabilizer and one (1) reel in the passenger's side front compartment over the passenger's side front stabilizer.

4.385.6 The cord reel should be configured with three (3) conductors.

4.385.7 Reel Warranty - The electric reel will come with a five (5)-year warranty provided by the reel manufacturer.

4.386 CORD - There will be 200 feet of Carol Super Vu-Tron II yellow 12/3 electrical cord provided for electrical distribution. The cord will be provided with a Fire Power connector. A total of two (2) will be provided.

4.387 120 VOLT RECEPTACLE - There will be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior duplex flip up cover(s), installed one in the center rear facing EMS box, mounted on the forward wall, down low, centered side to side. The NEMA configuration for the receptacle(s) will be 5-20R.

4.387.1 The receptacle(s) will be powered from the shoreline inlet.

4.387.2 There will be a label installed near the receptacle(s) that state the following:

- **A.** Line Voltage
- **B.** Current Ratting (amps)
- **C.** Phase
- **D.** Frequency

4.388 120 VOLT RECEPTACLE : There will be two (2), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior duplex flip up cover(s), installed LS4 and RS4 upper corner by the 12 volt studs. The NEMA configuration for the receptacle(s) will be 5-20R.

- **A.** The receptacle(s) will be powered from the shoreline inlet.
- **B.** There will be a label installed near the receptacle(s) that state the following:
- **C.** Line Voltage
- **D.** Current Ratting (amps)
- **E.** Phase
- **F.** Frequency

4.389 THREE SECTION 100 FOOT AERIAL PLATFORM SPECIFICATIONS

4.390 GENERAL INFORMATION: It is the intent of these specifications to describe a telescoping, elevating platform. The unit will consist of a three (3) section, aluminum ladder with a self-leveling basket attached, to the ladder fly section.

4.391 OPERATION ON GRADES: The aerial unit will be capable of operating safely, on any slope up to 10 degrees at full capacities. (Operation beyond this limit will be at the operator's discretion.)

4.392 CONSTRUCTION STANDARDS: The ladder will be constructed to meet all of the requirements as described in the current edition of NFPA 1901 standards. Some portions of this specification exceed minimum NFPA recommendations. They will be considered a minimum requirement to be met.

4.392.1 A safety factor of 2:1 is required for environmental loading (wind plus .25" of ice build-up). This structural safety factor will apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor will be as outlined in NFPA standards:

4.392.2 DL = Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components.

4.392.3 RL = Rated capacity stress. Stress produced by the rated capacity load of the ladder.

4.392.4 WL = Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system.

4.392.5 FY = Material yield strength. The stress at which material exhibits permanent deformation.

4.392.6 2.25 x DL + 2.25 x RL + 2.25 x WL equal to/less than FY. The minimum NFPA specification is exceeded here by providing a safety factor above 2:1 while flowing water.

4.392.7 2.0 x DL + 2.0 x RL + 2.0 x WL + 2.0 x wind loading equal to/less than FY.

4.392.8 The RL is reduced with a .25" ice build up to maintain a minimum 2:1 structural safety factor.

4.392.9 An independent engineering firm will verify the aerial safety factor. Design verification will include computer modeling and analysis, and extensive strain gauge testing witnessed by an independent registered professional engineer. Verification will include written certification from the independent engineering firm made available by the manufacturer upon request from the purchaser.

4.392.10 All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers will be performed by welders who are certified to American Welding Society (AWS) standards. The weldment assemblies of each production unit will be tested visually and mechanically by an ASNT certified level II non-destructive test technician to comply with NFPA standards. Testing procedures will conform to the AWS standards guide for non-destructive testing. Test methods may include dye penetrant, ultrasound, and magnetic particle where applicable.

4.393 LADDER CONSTRUCTION: The ladder will be comprised of three (3) sections and will extend to a nominal height, of 100 feet above the ground, as measured by 1901 recommendations.

4.393.1 The ladder will be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground. To insure a high strength to weight ratio and an inherent corrosion resistance, the aerial ladder will be completely constructed of high-strength aluminum. All side rails, rungs, handrails, uprights, and K braces will be made of structural 6061T6 alloy aluminum extrusions.

4.393.2 All material will be tested and certified by the material supplier. All ladder sections will be semi-automatically welded by shielded arc welding methods using 5356 aluminum alloy welding wire. Structural rivets or bolts will not be utilized in the ladder weldment sections.

4.393.3 The aerial ladder will consist of three (3) welded, extruded aluminum telescopic ladder sections. Each ladder section will consist of two (2) extruded aluminum side rails and a combination of aluminum rungs, tubular diagonals, verticals and two (2) full-length handrails. The rungs on all sections will be K braced for maximum lateral stability. This K bracing will extend to the center of each rung to minimize ladder side deflection.

4.393.4 The ladder rungs will be designed to eliminate the need to replace rubber-rung covers. The rungs will be spaced on 14.00" centers and have an integral skid-resistant surface as outlined in NFPA standards. An oval shaped rung will be utilized to provide a larger step surface at low angles and more comfortable grip at elevated positions. The minimum design load will be 500 lbs. distributed over a 3.50" wide area as outlined in NFPA standards.

4.393.5 Each aerial ladder section will have heat sensor labels that are preset to 300 degrees Fahrenheit with expiration year. The heat labels will meet NFPA standards.

4.393.6 The aerial ladder will exceed NFPA standards governing the minimum ladder section width and handrail height:

- **A.** Base section: 42.38" wide x 36.00" high
- **B.** Mid-section: 32.63" wide x 31.25" high
- **C.** Fly section: 24.00" wide x 27.38" high

4.394 VERTICAL HEIGHT: The ladder will extend to a minimum height of 100' above the ground at full extension and elevation. The measurement of height will be consistent with NFPA standards.

4.395 HORIZONTAL REACH: The rated horizontal reach will be 91'9". The measurement of horizontal reach will be consistent with NFPA standards.

4.396 OPERATION RANGE: The operating range of the ladder will be 11.5 degrees below horizontal (10 degrees with deep notch cab) to 76 degrees above horizontal with the truck in a level position.

4.396.1 The aerial will be capable of rotating from side-to-side around the back of the truck, encompassing up to 235 degrees of continuous rotation (depending on equipment and where it is located), while the aerial device remains at 11.5 degrees below horizontal (10 degrees with a deep notch cab). This will ensure that the platform stepping surface does not exceed the NFPA recommended maximum step height during a continuous rotation of up to 235 degrees.

4.397 MOUNTING OF ELEVATING PLATFORM; The aerial device will be rear mounted, to a torque box, on the truck chassis.

4.398 TORQUE BOX: A "torsion box" subframe will be installed between the two sets of stabilizers. The torque box will be constructed of a minimum .312" steel plate (50,000 pounds per square inch yield) with steel tubing reinforcement, on each side of the box, in the turntable area. The dimensions of the torque box will be 41.00" wide x 29.00" high x 247.63" long. There will be a 1/2" gap between the torque box and the frame rails to promote drying of the surfaces and reduce the effect of corrosion. The torque box subframe assembly will be capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers. The torque box will be bolted to the chassis frame rails using thirty-six .750" SAE grade 8 bolts with nuts.

4.399 TURNTABLE: The turntable will be a 1.00" thick aluminum deck, covered with a non-skid, chemical resistant material in the walking areas. The stepping surfaces will meet the skid-resistance requirements of the current NFPA 1901 standard.

4.399.1 The turntable will measure 88.50" long x 87.88" wide. The turntable will include an enclosure for the hydraulic valves and rotation motor, which will also serve as a step, for access to the ladder.

4.399.2 The turntable handrails will be a minimum 42.00" high and will not increase the overall travel height of the vehicle. The handrails will be constructed out of aluminum and have a slip resistant knurled surface.

4.399.3 The upper turntable assembly will connect the aerial ladder to the turntable bearing. The steel structure will have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

4.399.4 A 54.24" diameter turntable bearing with a 3.25" drive gear face will be bolted to the top of the bearing mounting plate with .88" diameter Grade 8 plated bolts. The gear teeth will be stub tooth form. The rated overturning moment of the turntable bearing will be a minimum of 441,400 ft. lbs.

4.400 ELEVATION SYSTEM: Dual 7.00" diameter elevating cylinders will be mounted on the underside of the base section of the ladder. Two (2) 2.50" diameter stainless steel pins will fasten the cylinder to the turntable and fasten to the ladder. The pins will have 125,000 psi minimum yield strength and will be secured with .50" Grade 8 bolts with lock nuts. The bolts are to ensure that the pins do not walk out of the mounting brackets on the turntable and base section.

4.400.1 The elevating cylinders will be mounted utilizing maintenance-free spherical bearings on both ends of the cylinders. The aerial base pivot bearings will be maintenance-free type bearings with no external lubrication required. The cylinders will function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders will be provided with pilot-operated check valves on the barrel and rod side of the piston to prevent movement of the ladder in case of a loss of hydraulic pressure.

4.400.2 The operation envelope will be 11.5 degrees below horizontal (10 degrees with a deep notch cab) to 76 degrees above horizontal.

4.400.3 The elevation system will be designed following NFPA standards. The elevation hydraulic cylinders will incorporate cushions on the upper limit of travel.

4.400.4 The lift cylinders will be equipped with integral holding valves located in the cylinder to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves will NOT be located in the transfer tubes.

4.400.5 The elevation system will be controlled by the microprocessor. The microprocessor will provide the following features:

- **A.** Collision avoidance of the elevation system to prevent accidental body damage
- **B.** Automatic deceleration when the aerial device is lowered into the cradle
- **C.** Automatic deceleration at the end of stroke, in maximum raise and lower positions
- **D.** Deceleration of the aerial device at the limits of travel

4.401 EXTENSION/RETRACTION SYSTEM: A hydraulically powered, extension and retraction system will be provided through dual hydraulic cylinders and wire ropes. Each set will be capable of operating the ladder in the event of a failure, of the other. The extension cylinder rod will be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders will be equipped, with integral holding valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

4.401.1 Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope will be galvanized to reduce corrosion.

4.401.2 The ladder assembly will consist of three (3) separate weldments that will extend and retract within each other. Nylatron PAG + OIL slide pads will be utilized between each section to minimize friction. Four (4) T type interlocking load transfer stations will enclose the slide pads. The transfer stations will be located at the upper portion of the base and second ladder sections. Additional guide pads will be located along the aerial section to guide the ladder during retraction and extension.

4.401.3 The extension/retraction system will be controlled by the microprocessor. The microprocessor will provide the following features:

- **A.** Automatic deceleration at the end of stroke, in maximum extend and retract positions
- **B.** Controls the rate of retraction while flowing water

4.401.4 All sheaves will be greaseless and all sheave pins and pivot pins will be polished stainless steel.

4.402 ROTATION SYSTEM: The aerial will be supplied with a powered rotation system as outlined in NFPA standards. The hydraulic rotation motor will provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation. Two (2) hydraulically driven, planetary gear boxes with drive speed reducers will be used to provide infinite and minute rotation control throughout the entire rotational travel. Two (2) spring applied, hydraulically released disc type swing brakes will be furnished to provide positive braking of the turntable assembly. Provisions will be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system will be equipped with pressure relief valves which will limit the rotational torque to a nondestructive power. The gearbox will have a minimum continuous torque rating of 60,000 in. lbs. and a minimum intermittent rating of 130,000 in. lbs. The turntable bearing, ring gear teeth, pinion gear, planetary gearbox, and output shaft will be certified by the manufacturer of the components for the application.

4.402.1 The rotation system will be controlled by the microprocessor. The microprocessor will provide the following features:

A. Envelope control of rotation system to prevent accidental body damage

B. Prevent the aerial from being rotated into an unstable condition

4.403 MANUAL OVERRIDE CONTROLS: Manual override controls will be provided for all aerial and stabilizer functions.

4.404 LADDER SLIDE MECHANISM: Wear pads will be used between the telescoping ladder sections, to reduce friction for smoother operation. Slide pads will also be used to control side play between the ladder sections.

4.405 BASKET LEVELING SYSTEM: A basket leveling system will be provided and so designed, that the basket with its rated load, can be supported and maintained level, relative to the horizontal, regardless of the elevation or flexion of the ladder.

4.405.1 Basket leveling will be accomplished by hydraulic circuitry that is independent from the main hydraulic system. The leveling of the basket features a dual master/slave hydraulic cylinder system, with each side capable of supporting the load, while maintaining the basket level. Two (2) master cylinders are mounted between the turntable and the base ladder section, with two (2) slave cylinders mounted between the ladder fly section and the basket. The slave and master cylinders are synchronized, so as the ladder is raised or lowered, exact amounts of hydraulic fluid are transferred between the master and slave cylinders thus maintaining the basket level.

4.405.2 The hydraulic circuitry includes pressure operated counter balance valves, on the load side of the slave cylinders, to prevent the basket from tipping should the hydraulic lines be severed.

4.405.3 A momentary switch is provided, on the cab instrument panel, to level the basket should this become necessary due to ambient temperature changes. It is not necessary to start the engine and activate the main hydraulic system to level the basket.

4.405.4 The basket leveling system will be manually adjustable from 10 degrees below horizontal to 10 degrees above horizontal.

4.405.5 Manual basket leveling switches will be provided at the turntable and basket.

4.406 ROTATION INTERLOCK: The microprocessor will be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor will allow full and unrestricted use of the aerial, in the 180 degree area, on the side(s) where the stabilizers have been fully deployed. The system will also have a manual override, to comply with NFPA 1901.SYSTEMS THAT PERMIT THE AERIAL TO ROTATE TO THE "SHORT JACK" SIDE, WITHOUT AUTOMATICALLY STOPPING THE ROTATION AND/OR WITHOUT ACTUATION OF THE "MANUAL OVERRIDE", WILL NOT BE ACCEPTED. SYSTEMS THAT ONLY INCLUDE AN ALARM ARE NOT CONSIDERED AN INTERLOCK AND WILL NOT BE ACCEPTED.

4.407 LOAD CAPACITIES: The following load capacities will be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities will be based upon full extension and 360 degree rotation.

4.407.1 A load chart will be visible at the operator's station. The load chart will show the recommended safe load at any condition of the aerial device's elevation and extension. The ratings in the unsupported, fully extended configuration (in addition to 100 lbs. of equipment mounted at the tip) will maintain a 2:1 safety factor with a 35 mph wind.

4.407.2 The aerial device will have a rated capacity of 1000 lbs. consistent with standards. The rated capacity will include 1000 lbs. in personnel allowance and 100 lbs. for equipment mounted at the tip of the ladder. The aerial device will be rated in multiple configurations as outlined in NFPA standards.

A. 35 MPH WIND CONDITIONS/WATERWAY DRY

Degrees of Elevation	-11.5 to 29*	30 to 39	40 to 49	50 to 76
Basket	1000	1000	1000	1000
Fly Tip	-	250	500	750
Mid Tip	-	250	500	750
Base	250	500	1000	1000

* -10 degrees with deep notch cab

B. 35 MPH WIND CONDITIONS/WATERWAY CHARGED

Degrees of Elevation	-11.5 to 29*	30 to 39	40 to 49	50 to 76
Basket	500	500	500	500
Fly Tip	-	250	500	750
Mid Tip	-	250	500	750
Base	-	500	1000	1000

* -10 degrees with deep notch cab

4.407.3 Reduced loads at the fly can be redistributed to the mid or base sections as needed.

4.407.4 The aerial device will be able to maintain the above load capacities while flowing up to 1500 GPM and a nozzle position of 0 to 90 degrees to either side of the ladder centerline, as far above and below horizontal to the platform as nozzle design allows.

4.407.5 While flowing 1500 to 2000 GPM, the nozzle position will be limited to 45 degrees either side of the ladder centerline horizontal to the platform, 30 degrees above horizontal, and as far below horizontal to the platform as nozzle design allows.

4.407.6 Reduced loads in the basket can be redistributed in 250 lb. increments to the fly, mid, or base as needed.

4.408 LADDER CRADLE INTERLOCK SYSTEM: A ladder cradle interlock system will be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch will be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

4.409 BOOM SUPPORT: A heavy-duty boom support, constructed of steel, must be provided for support of the ladder in the travel position. The boom support will be bolted to the chassis frame as close to the front axle as design allows. On the base section of the ladder, a stainless steel scuffplate will be provided where the ladder comes into contact with the boom support.

4.409.1 The boom support will be located just to the rear of the chassis cab, recessed into the engineer compartment.

4.410 AERIAL BOOM SUPPORT LIGHT: There will be one (1) Amdor®, Model AY-LB-12SHW012, 190 lumen, 12" long, LED strip light with white LEDs and surface mounts provided on the boom support cradle. This light will be activated when the aerial master switch is activated.

4.411 HYDRAULIC TANK SPECIAL LOCATION: The hydraulic tank will be located on top of the torque box at the front.

4.412 AERIAL BOOM PANEL: There will be one boom panel provided on the base section on the left side of the aerial device while viewed from the turntable. This boom panel will be sized to match the storage box on the opposite side. The boom panel will be painted #90 red.

4.412.1 The boom panel will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.

4.413 EXTENSION INDICATOR: Extension markings and corresponding numerical indicators will be provided along each inside and outside top rail of the base section of the aerial every 10'. They will indicate various positions of extension up to full. Markings and indicators will be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators will be red reflective material.

4.414 LADDER STORAGE MOUNTING BRACKETS: Mounting brackets for a single roof ladder will be provided on the left side of the aerial device while viewed from the turntable. A total of one (1) roof ladder(s) will be stored on the aerial base section. The bracket(s) will be located inboard of the boom panel at the base section.

4.414.1 The mounting brackets will accommodate a 16' Duo-Safety 875-A roof ladder(s) to be stored individually as determined by the type of aerial device and the available space.

4.415 LIMITED RETRACTION: The aerial device will have limited retraction.

4.416 ADDITIONAL INCLINOMETER: There will be one (1) additional inclinometer(s) provided to indicate the degree of elevation of the aerial device. The inclinometer(s) will be located on the outside of the base section on the opposite side of the standard location.

4.416.1 A light will be provided to illuminate the inclinometer.

4.417 PIKE POLE AND AXE MOUNTING BRACKETS: Mounting will be provided near the end of the fly section on the left side of the aerial device while viewed from the turntable for one (1) pike pole and a fire axe.

4.417.1 The bracket will be sized to hold a Fire Hooks Unlimited 8' pike pole.

4.417.2 The axe mounting will be provided on the aerial tip side and the pike pole mounting will be provided towards the aerial turntable.

4.418 STOKES AND LYFE BRACKET STORAGE BOX: There will be an aluminum storage box provided at the base section of the aerial ladder on the right side of the aerial device while viewed from the turntable. The box will be painted job color. The box will be located in place of the aerial boom panel and have a hinged cover with butterfly latch to secure the stokes basket and Lyfe brackets. The cover will have the same finish as the box. A divider will be provided to separate the stokes basket and the brackets. The box will have no louvers.

4.418.1 The size of the stokes basket will be 86 x 8 x 25 stokes. and storage to hold the 3 in 1 life brackets.

4.418.2 The maximum capacity of this box will be 75 lb.

4.419 BASKET STRUCTURE: The basket structure will be constructed of structural T6061 aluminum and integrated with the construction of the waterway to ensure a high strength-to-weight ratio. The aerial basket will be fully tested and independent third party certified.

4.419.1 The flooring and front decking of the basket will be multi-piece non-slip material, preventing the accumulation of water on the standing surface. The floor will measure approximately 37.19" long x 78.13" wide. The stepping surfaces will meet the skid-resistance requirements of current NFPA 1901 standard.

4.419.2 The outside basket steps will be at the same level as the basket floor. The steps on the front and sides are approximately 8.00" deep. The doors and front corners of the basket will be at 45 degrees to allow the basket to be maneuvered closer to buildings when approaching at an angle.

4.419.3 Four (4) stainless steel pompier belt safety loops will be attached to the inside of the basket. Two (2) lifting eyes will be provided on the bottom side of the basket support structure.

4.419.4 Two (2) rubber bumpers are provided on the bottom side of the basket structure for damage protection when setting it down on a surface.

4.419.5 The basket interior will be illuminated as required per the current edition of NFPA 1901. All hoses and wiring at the basket will be fully enclosed. Electrical sub-components will be mounted under the basket in a separate enclosure for easy servicing while maintaining an unobstructed basket interior.

4.420 BASKET SIDES: The sides of the basket will be of tubular aluminum construction and aluminum sheet skin with engine turned finish and, along with the basket doors, will form a continuous 42.00" high wall around the basket.

4.421 PLATFORM ENTRANCES/EXITS: Two (2) swing-in, spring-loaded, self-closing double pan doors will be of single pan aluminum construction with engine turned finish and will be provided on the 45 degree angles at the front of the platform. A paddle style door latch will allow the basket doors to be opened from the outside by applying pressure to the paddle with the hand. The rear of the basket will be equipped with a vertical self-closing gate for transfer to and from the basket's ladder device. Telescoping-type handrails will be provided as a banister to bridge the gap between the basket and the fly section at all elevations.

4.422 ACCESSORY MOUNTING RECEPTACLES: Two (2) universal accessory mounting receptacles will be permanently affixed on the front of the basket to receive the LyfeLine™ family of options such as the LyfeSupport™ rescue basket holders, LyfeEye™ rappelling arms, LyfeLadder™ roof ladder brackets, LyfeHoist™ winch, etc. Complete interchangeability will be required without modification to the basket.

4.423 MULTIPLEX DISPLAY COVER: A cover will be provided for the multiplex display in the platform basket. The cover will be hinged at the front of the basket and when down it will cover the multiplex display. The cover will be constructed of brushed stainless steel. The cover will be held down with a rubber draw latch.

4.424 HOSE BOX AT PLATFORM: There will be one (1) hose storage box(es) with a cover and rubber hood latch provided at the platform. The box(es) will be located at the right side of the basket when viewed from the turntable and will match the finish of the aerial device. The box(es) size will be 7.5" x 21.5" x 30.5" deep.

4.425 LIGHTS FOR TURNTABLE WALKWAY: There will be white LED lights provided at the aerial turntable. The lights will be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights will be activated by the aerial master switch.

4.426 TURNTABLE CONSOLE LIGHTING: There will be one (1), TecNiq Model T10, white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights will be activated by the aerial master switch.

4.427 TURNTABLE DECK COATING: The turntable deck will be provided with non-slip coating that is grey in color.

4.428 BASKET HEAT SHIELDS: A heat reflective shield will be provided on the front, sides and bottom of the basket.

4.428.1 The double pan basket access doors will form the heat shield at the front of the basket. The side heat shields will be formed by a single sheet of .063 aluminum.

4.428.2 Full under the basket heat shield protection, with a non-glare finish, will be provided with a swing-down door for ease of servicing.

4.429 INFORMATION CENTER: There will be an information center provided. The information center will operate in temperatures from -40 to 185 degrees Fahrenheit. The information center will employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD will have a minimum 400nits rated, color display. The LCD will be sunlight readable, true digital operation, and will have improved resolution. The LCD display will be encased in an ABS, black plastic housing with a gray decal. There will be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

4.430 OPERATION: The information center will be designed for easy operation in everyday use. There will be a page button to cycle from one screen to the next screen in a rotating fashion. A video button will allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center will return to the vehicle information screens. There will be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels will be specific to the information being viewed.

4.431 GENERAL SCREEN DESIGN: Where possible, background colors will be used to provide vehicle information At A Glance. If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an amber background color will indicate a caution condition and a red background color will indicate a warning condition.

4.431.1 Every screen in the information center will include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time will be synchronized between all Command Zone color displays located on the vehicle. The Alert Center will display text messages for audible alarms. The text messages will identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm will cycle every second until the problems have been resolved. The background for the Alert Center will change to indicate the severity of the warning message. Amber will indicate a caution condition and red will indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color will be shown for all Alert Center messages.

4.431.2 A label will be provided for each button. The label will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will have a button label with no text.

4.431.3 Symbols will accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

4.432 PAGE SCREENS: The Information center will include the following pages:

4.432.1 The Aerial Main and Load Chart page will indicate the following information:

A. Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols.

B. Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.

C. Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time.

D. Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graph shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10%, the red bar graph will flash.

E. At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

4.432.2 The Aerial Reach and Hydraulic Systems page will indicate the following information:

A. Aerial Hydraulic Oil Temperature will be indicated with symbol and text. At A Glance features will be utilized.

4.432.3 Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. At A Glance features will be utilized. The following calculations will be indicated on a representative vehicle symbol:

A. Aerial Device Extension length

B. Aerial Device Height indicating the height of the aerial device tip from the ground

C. Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.

D. Aerial Device Angle indicating the angle from the vehicle which the device is at.

E. At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

4.432.4 The Level Vehicle page will indicate the following information:

A. The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.

B. The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.

C. Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:

D. Outrigger stowed indicated with a silver pan located close to the vehicle

E. Outrigger fully extended indicated with a fully deployed green outrigger

F. Outrigger short-jacked indicated by a yellow outrigger partially deployed

G. Outrigger not set indicated by a red outrigger that is not set on the ground

H. A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system. The following status will be indicated in the text box:

I. Deployed status will indicate all outriggers are properly set on the ground at full extension

J. Short-jacked status will indicate one or more outriggers are set on the ground but not fully extended.

K. Not Set status will indicate one or more outriggers is not properly set on the ground.

L. Stowed status will indicate all outriggers are stowed for vehicle travel.

M. A bedding assist alert will indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick.

N. At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

O. MENU SCREENS: The following screens will be available through the Menu button:

4.432.5 The View System Information screen will display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

4.432.6 The Set Display Brightness screen will allow brightness increase and decrease and include a default setting button.

4.432.7 The Configure Video Mode screen will allow setting of video contrast, video color and video tint.

4.432.8 The Set Startup screen allows setting of the screen that will be active at vehicle power-up.

4.432.9 The Set Date and Time screen has a 12- or 24-hour format, and allows setting of the time and date.

4.432.10 The View Active Alarms screen shows a list of all active alarms including the date and time of each alarm occurrence, and shows all alarms that are silenced.

4.432.11 The System Diagnostics screen allows the user to view system status for each module and its respective inputs and outputs. Viewable data will include the module type and ID number; the module version; and module diagnostics information including input or output number, the circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

4.432.12 Aerial Calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

4.432.13 Button functions and button labels may change with each screen.

4.433 LOWER CONTROL STATION: A lower control station will be located, at the rear of the apparatus, in an easily accessible area. The controls and indication labels will be illuminated, for nighttime operation. The following items will be furnished at the lower control station and will be clearly identified and conveniently located for ease of operation and viewing:

A. Level assist switch

B. Override switch to override interlocks

C. Emergency power unit switch

4.434 AERIAL DEVICE CONTROL STATIONS: There will be two (2) device control stations. One (1) will be referred to as the basket control station and the other as the turntable control station. All elevation, extension and rotation controls will operate from both of these locations. The controls will permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. The controls will be grouped and operate in an identical manner at both stations for similarity of operation. The controls will be clearly marked and lighted for nighttime operation.

4.434.1 Each control will be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the basket controls, even if the ladder is being operated by the basket controls.

4.435 TURNTABLE CONTROL STATION: The turntable control station will be located, on the left side of the turntable, so the operator may easily observe the basket while operating the controls.

4.435.1 The following items will be installed at the turntable control station, clearly identified, lighted for nighttime operation and conveniently located for ease of operation and viewing:

4.435.2 Electric controls for elevation, rotation, extension/retraction

4.435.3 Manual electric controls for basket leveling

4.435.4 Intercom controls

4.435.5 Tip tracking light switch

4.435.6 Emergency power unit switch

4.435.7 Operator's load chart

4.435.8 Three (3) position switch for selecting aerial operational speed

4.436 TURNTABLE WORK LIGHTS: There will be a minimum of two (2) 12-volt work lights installed on the turntable, to illuminate the surrounding area for nighttime operation. The work lights will be activated by the aerial master switch.

4.437 BASKET CONTROL CONSOLE: The basket instrument panel will be located at the front center, of the aerial platform. The following controls will be installed at the console and be clearly identified, illuminated for nighttime operation and conveniently located for ease of operation and viewing:

4.437.1 Intercom controls

4.437.2 Operator's load chart

4.438 AERIAL FUNCTION CONTROLS: The aerial function controls, elevation, rotation, extension/retraction will be mounted in a separate backlit control box, which will be attached to the front of the platform control console, by means of an easily removable slide mechanism. The aerial function control box will have three (3) fixed attachment points in the basket. The electrical connection will be by a strain relieved, coiled cord that is permanently attached to the control box. To reduce the excess cord in the basket, the coiled cord will use a deutsch style bayonet connector style plug and there will be three (3) locations in the basket. The legend for the control lever functions will be illuminated.

4.438.1 HIGH IDLE: The high idle will be controlled by the microprocessor. The microprocessor will automatically adjust the engine rpm, to compensate for the amount of load placed upon the system. The system will include a safety device that allows activation of the high idle, only when the parking brake is set and the transmission is placed in neutral.

4.438.2 STABILIZERS: Two (2) sets of extendible, out and down, "H" type stabilizers will be provided for stability. The stabilizers will have a spread of 16' 6".

4.438.3 The stabilizers will be the double box design, with jack cylinders, that have a 4.25" internal diameter (bore), 3.00" diameter cylinder rod and a 34.88" stroke. The jack cylinders will be equipped with integral holding valves, which will hold the cylinder in either the stowed position or the working position, should a charged line be severed at any point within the hydraulic system. For safety, the integral holding valves will be located in the cylinder base end, NOT in the transfer tube. Vertical jack cylinder rods will be fully enclosed by a telescoping inner box to protect the cylinder rods against damage that may occur.

4.438.4 The extension cylinders will be totally enclosed within the extension beams. The horizontal extension cylinders will be of the trombone type to eliminate wear and potential failure of hydraulic hoses.

4.438.5 The stabilizers will have the capability of 18.00" of ground penetration, for set-up on uneven terrain. Extension of the horizontal beams will be activated by an extension cylinder, which has a 2.25" internal diameter (bore), 1.38" diameter cylinder rod and a 48.25" stroke. The extension cylinders will be totally enclosed within the extension beams. The cylinders will be equipped with internal decelerators. The cross section dimensions will be 13.00" high x 6.81" wide.

4.438.6 Each stabilizer leg will have attached to the end of the leg a 16 gauge polished stainless steel shield. The stainless steel shield will be of the split-pan design and will be a maximum 13.50" wide to allow the extension of the stabilizer between parked cars. This plate will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back for added strength.

4.439 STABILIZER CONTROLS: A portable stabilizer control box will be provided. The control box will be weatherproof and oil resistant. Each function and indicator light will be labeled on a metal photo panel. The control box can be taken as far away as 15 feet from the vehicle with an extension cable. The stabilizer control box will include the following:

4.439.1 One (1) green power indicator light for stabilizer control that will be illuminated when the aerial master and "PTO" switches in the cab are activated.

4.439.2 Four (4) electric joysticks for stabilizers: each toggle switch will control the extend/retract and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.

4.439.3 Leveling assist push button: The outrigger control system will incorporate a computerized self-leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically level the truck. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.

4.439.4 One (1) electric push button for the engaging the emergency power unit

4.439.5 One (1) red "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.

4.439.6 Four (4) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.

4.439.7 Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

4.439.8 Each joystick will activate the engine fast idle automatically.

4.439.9 Manual override will be supplied for each stabilizer control valve.

4.439.10 A "Stabilizers Not Stowed" indicator will be provided in the driver's compartment. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the apparatus if moved. The stabilizer system will also be wired to the "Do Not Move Indicator Light", which will flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.

4.440 STABILIZER PADS: A one (1) position, floating stabilizer pad will be provided on each stabilizer. The pads will require no operator adjustment during set up. The stabilizer pad will have the ability to pivot, in a 360-degree plane, for set up on uneven terrain.

4.441 AUXILIARY STABILIZER PADS: A set of four auxiliary pads with handles will be provided for additional load distribution on soft surfaces. Their size will be 31.00" x 26.00" and they shall be constructed of a lightweight composite material. The ground contact area for each stabilizer will be such that a unit pressure not greater than 75 psi (500 kPa) will be exerted over the ground contact area when the apparatus is loaded to its maximum in-service weight and the aerial device is carrying its rated capacity in every position permitted by the manufacturer. The pads will be stored in a double stacked configuration, two (2) behind each rear tandem axle in a single bracket.

4.442 CRADLE INTERLOCK SYSTEM: A cradle interlock system will be provided, to prevent the lifting of the aerial from the nested position, until the operator has positioned all the stabilizers in a load-supporting configuration. A switch will be installed at the cradle, to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

4.443 STABILIZER PINS: The stabilizer jacks will not have holes for the stabilizer pins.

4.444 STABILIZER CONTROL BOX ALUMINUM DOOR: A vertically hinged smooth aluminum door will be provided over the stabilizer control box. The door will be hinged outboard.

4.445 STABILIZER PANELS: The stabilizer panels will be painted stainless steel in place of polished stainless steel.

4.446 HYDRAULIC SYSTEM: All high-pressure hoses will have an abrasion resistant cover, and have a rating greater than or equal to the working pressure of the circuit in which they are installed. All hydraulic fittings will be plated to minimize corrosion. The fitting will use an O-ring face seal, where possible, to minimize hydraulic leaks. All pressure carrying hydraulic hoses will have a 4:1 safety rating based on burst pressure

4.446.1 An interlock will be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in NFPA standards.

4.446.2 The hydraulic system will be of the load sense design to minimize heat build up and provide smooth control of the aerial ladder. The system will meet the performance requirement in NFPA standards, which requires adequate cooling after less than 2 1/2 hours of operations.

4.446.3 All hydraulic components that are non-sealing, where failure could result in the aerial movement, will comply with NFPA standards and have burst strength of 4:1. Dynamic sealing components, where failure could cause aerial movement, will have a margin of 2:1 on maximum operating pressure per NFPA standards. All hydraulic hoses, tubes, and connections will have minimum burst strength of 3:1 per NFPA standards.

4.446.4 A hydraulic oil pressure gauge will be supplied at the base control location per NFPA standards.

4.446.5 The aerial hydraulic system will be designed in such a manner that a hydraulic pump failure or line rupture will not allow the aerial or outriggers to lose position. Hydraulic holding valves will be mounted directly into cylinders. To insure reliable performance of holding valves, no hoses or tubing will be permitted between a holding valve and cylinder. The aerial will incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks. Hydraulic power to the ladder will be transferred from the pedestal by a hydraulic swivel.

4.447 HYDRAULIC RESERVOIR: The hydraulic system will consist of an oil reservoir mounted to the torque box and plumbed to the hydraulic pump. There will be plumbing for a supply and return line and a tank drain on the reservoir.

4.447.1 The hydraulic pump suction line will have a shut-off ball valve for pump servicing.

4.447.2 The hydraulic oil reservoir fill will be labeled per NFPA standards. The hydraulic system will use multi-weight, SAE grade oil. ISO grade will be based on geographical location. The manufacturer will certify that the oil meets or exceeds the hydraulic cleanliness rating of 18/15/13 per ISO 4406:1999 before delivery.

4.448 HYDRAULIC FILTERS: The system will incorporate the following filters to provide dependable service:

- **4.448.1** Separate magnet (not on strainer)
- **4.448.2** Reservoir suction strainer: 125 mesh
- **4.448.3** Pressure filter with dirt alarm: Nominal 5 micron filter with a rating of 6.5 micron @ Beta 200 (99.5% efficiency); 7.5 micron @ Beta 1000 (99.9% efficiency)
- **4.448.4** Return filter with dirt alarm: Nominal 5 micron filter with a rating of 6.5 micron @ Beta 200 (99.5% efficiency); 7.5 micron @ Beta 1000 (99.9% efficiency)
- **4.448.5** Desiccant breather filter: Water capacity 4 fluid oz, 5 micron rating

4.449 HYDRAULIC CYLINDERS: All hydraulic cylinders used on the aerial device will be produced by a manufacturer that specializes in the production of hydraulic cylinders.

4.450 POWER TAKEOFF / HYDRAULIC PUMP: The apparatus will be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift located inside the cab. The power takeoff, which drives the hydraulic pump, will meet all the requirements for the aerial unit operations. The hydraulic pump will be a variable displacement piston pump, for consistent and rapid response, and be capable of supplying hydraulic oil at a nominal 50gpm flow at pressures up to 3000 psi. The system will operate up to 3000 psi with flow controls to protect hydraulic components and incorporate a relief valve set at 3150 psi to prevent over pressurization. The hydraulic pump will be solely dedicated to aerial operations. An amber indicator light will be installed on the cab instrument panel to notify the operator that the power takeoff is engaged.

- **4.450.1** An interlock will be provided that allows operation of the aerial power takeoff shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle.

4.451 EMERGENCY PUMP: The hydraulic system will be designed with an auxiliary power unit meeting the guidelines of NFPA standards. The auxiliary power unit will be a 12-volt pump connected to the chassis electrical system. The pump will provide operation at reduced speeds to store the aerial device and outriggers for road transportation.

- **4.451.1** Self-centering switches will be provided at the turntable and stabilizer control station to activate the system. The system will be designed to provide a minimum of 30 minutes of hydraulic power to operate functions.

4.452 HYDRAULIC SWIVEL: The aerial ladder will be equipped with a three (3) port, high-pressure hydraulic swivel that will connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel will allow for 360 degree continuous rotation of the aerial.

4.453 ELECTRIC SWIVEL: The ladder will be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 36 collector rings will be provided that are capable of supplying 20 amp continuous service. All collector rings will be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone will be used.

4.454 WATER SWIVEL: Water will be transferred to the aerial waterway by means of a 5.00" internal diameter waterway, through the swivel, permitting 360 degree continuous rotation.

4.455 13-BIT ABSOLUTE ENCODER: The aerial ladder will be equipped with a 13-Bit Absolute Encoder, CAN-based, which provides 8192 counts per shaft turn for position and direction reference.

- **4.455.1** The 13-Bit Absolute Encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.
- **4.455.2** If the power is interrupted for any reason, the 13-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.
- **4.455.3** The 13-Bit Absolute Encoder will be an integral part of a microprocessor based control system.

4.456 ELECTRICAL SYSTEM: The 100' platform will utilize the Pierce Command ZoneTM System. The system will consist of the following components:

4.456.1 A tethered, CAN-based, stabilizer control will be provided. The tethered control will be weatherproof and oil resistant. The stabilizer control will be illuminated with a LED strip light in the face of the unit. The electrical connection at the tethered control will be permanently attached by a strained relieved coil cord that will allow the operator to move at least 14 feet away from the electrical connection for operation.

4.456.2 Remote Stabilizer Controls

4.456.3 Brightness control

4.456.4 Weatherproof and oil resistant

4.456.5 One (1) green "power" indicator light

4.456.6 One (1) red "stabilizer not stowed" indicator light

4.456.7 One (1) electric push button for level assist

4.456.8 One (1) electric push button for the emergency power unit

4.456.9 One (1) electric joystick for each stabilizer control:

a. Extend/retract function

b. Raise/lower function

4.456.10 One (1) green "stabilizer fully extended" indicator light for each stabilizer

4.456.11 One (1) green "firm on ground" indicator light for each stabilizer

4.456.12 Control System Modules

4.456.13 Each of the control system modules will be configured as follows:

a. Sealed to a NEMA 4X rating

b. Operating range from -40 degrees F to 156 degrees F (-40 degrees C to 70 degrees C)

c. Communicate using J1939 data link

4.456.14 Two (2) diagnostic LED lights

4.456.15 One (1) green light that illuminates when module has power (B+) and ground

4.456.16 One (1) red light that flashes to indicate the module is capable ofcommunicating via the data link

4.456.17 Up to 16 diagnostic LEDs on each module

4.456.18 Ground matrix identification system

4.456.19 The following control system modules will be used:

4.456.20 Control Module

a. Main controller for the system

b. USB connection allows for computer diagnostics

4.456.21 Power Module

a. Built-in fault sensing

b. Eight (8) digital outputs

c. Pulse width modulating (PWM) capable

d. 10A continuous per output

4.456.22 Circuit protection based on actual current draw (not affected by heat)
4.456.23 Current Control Module
4.456.24 Built-in fault sensing
4.456.25 Three (3) analog inputs
4.456.26 Eight (8) digital outputs
4.456.27 Pulse width modulating (PWM) capable
4.456.28 3A continuous per output
4.456.29 Closed Loop System
4.456.30 Circuit protection based on actual current draw (not affected by heat)
4.456.31 Input Module
4.456.32 16 software selectable (digital or analog) inputs
4.456.33 Output Module
4.456.34 16 digital outputs
4.456.35 Input/Output Module
4.456.36 Eight (8) software selectable (digital or analog) inputs
4.456.37 Eight (8) digital outputs

4.457 AERIAL LIGHTS: There will be two (2) Fire Research SoBrite, SRA110-07A*, 12 volt DC LED lights provided as tracking lights:

4.457.1 One (1) light will be mounted on the driver's side of the base section of the ladder
4.457.2 One (1) light will be mounted on the passenger's side of the base section of the ladder
4.457.3 Power to the tracking lights will be controlled by a switch at the turntable operators platform and the basket.
4.457.4 There will be one (1) Fire Research Spectra, Model SPA100-Q15*, 12 volt DC LED floodlight provided at the front of the basket.
4.457.5 The tip lights will be controlled by platform/tip, turntable, driver side cab switch panel, and passenger side cab switch panel.
4.457.6 The painted parts of this light assembly to be black.
4.457.7 The lights will be mounted below the handrail height so as not to increase the overall height of the unit.

4.458 AERIAL LOCATOR LIGHT: There will be two (2) beacons installed at the aerial tip for the purpose of locating the aerial device while in operation.

4.458.1 The beacons will be Whelen Model L31H*F, LED.
4.458.2 Both beacons will be activated whenever the aerial is raised from the cradle.
4.458.3 The color of the locator light will be amber.
4.458.4 The lens color will be the same color as the LED's.
4.458.5 The lights may be load managed when the parking brake is applied.

4.459 STABILIZER WARNING LIGHTS: There will be our (4) Whelen®, Model M6*C, LED flashing warning lights with Whelen, Model M6FC, chrome flanges installed, one (1) on each stabilizer cover panel.

4.459.1 The front stabilizer pan lights will be red LED with a clear lens
4.459.2 The rear stabilizer pan lights will be red LED with a clear lens
4.459.3 These warning lights will be activated by the same switch as the side warning lights.

4.460 STABILIZER BEAM WARNING LIGHTS: Two (2) 4.00" diameter red LED flashing lights will be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. The lights will be Grote Supernova 40 series LED lights. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.

4.461 STABILIZER SCENE LIGHTS: There will be one (1) Amdor®, Model AY-LB-12HW012, 190 lumen, 12" long, white LED strip light installed under each stabilizer beam to illuminate the surrounding area. A total of four (4) lights will be installed. The lights will be activated by the aerial master switch.

4.462 PLATFORM 120-VOLT ELECTRIC SYSTEM: Two (2) Fire Power 120-volt 20 amp three (3)-wire type with weather resisting cover receptacles with weatherproof covers will be provided in the aerial platform.

4.462.1 The receptacles will be located at the rear of the basket.

4.462.2 Each receptacle will be supplied from individual branch circuits protected by dedicated 20 amp/120-volt circuit breakers. All wiring will be sized to and conform to the latest edition of NEC standards.

4.462.3 The circuit will be labeled "Aerial Ckt #1"

4.463 120 VOLT SIDE PLATFORM LIGHTING: There will be one (1) Fire Research Spectra, Model SPA260-K20, 20,000 lumens 120 volt AC surface mount LED light(s) with black bezel(s) provided passenger side only. Due to the light optics the lights will be installed so the light is directed downward.

4.463.1 These light(s) will be switched at the platform/tip, turntable, and driver side and passenger side cab.

4.464 COMMUNICATION SYSTEM: An Atkinson three (3)-way communications system will be provided. The communication system will be furnished between the platform, the pump operator's panel and the turntable operator's position. The master control located at the turntable control console will have the transmitting and receiving volume controls along with the push to talk button. A self-contained "hands-off" speaker microphone will be located in the platform which will require no operator attention to transmit or receive.

4.465 BREATHING AIR: Breathing air will be supplied to the aerial platform. The air system will incorporate one (1), 437 cubic foot, 4500-psi cylinder. To allow the turntable operator an unobstructed view of the platform the cylinder will be mounted on the right side of the ladder. The air cylinder will be interconnected through a pressure regulator located at the air cylinder. A shutoff valve with guard will be provided on the cylinder. At the platform, the breathing air will be accessible via two (2) quick couplings for air masks. These will have a Hansen brass 3000 series coupling. One (1) coupling will be located at the front of the basket on the right side and one (1) coupling will be located at the rear of the basket on the left hand side. There will be a Breathing Air Mask Box. A 100' recharge hose will be provided for refilling the air cylinder without having to remove the tank from its mounting.

4.465.1 The breathing air cylinder will be designed and constructed to conform to the requirements of the United Nations (UN) on the transportation of dangerous goods.

4.466 BREATHING AIR LEVEL AND WARNING SYSTEM: The level of breathing air remaining will be visible on the LCD display at all operating positions. The display will incorporate a low-pressure warning circuit that activates an audible alarm when 20% of maximum air cylinder capacity remains. A second, louder audible alarm will activate when the remaining air level drops to 10% of maximum air cylinder capacity.

4.467 AIR BOTTLE LETTERING: The cylinder for the breathing air mounted on the aerial device will have white colored lettering for the graphics.

4.468 RAISED AERIAL PEDESTAL: The aerial pedestal will be raised to accommodate the height of the cab.

4.469 LYFECOMBO™BRACKETS: One (1) set of brackets will be supplied and mounted to the front of the platform basket. The brackets have been designed to increase firefighter safety and add to the functionality of the aerial device. The brackets will have three (3) functions that include: securing the roof ladder to the basket to allow firefighter access below the basket, two (2) rappelling arms to serve as an anchor point which allow rappelling from the basket, and mounting bars to allow the secure mounting of a rescue basket for transporting patients using the aerial. Each bracket will be easily removable using two (2) positively latched, 1.00" diameter aluminum pins.

4.469.1 LyfeLadder™ support brackets will be incorporated into the design of the 3-in-1 option brackets. The brackets will be designed to mount an 875A Duo-Safety roof ladder up to 20 feet long securely in place. The ladder will be secured through its beams and one (1) rung, by a 1.00" diameter aluminum rod capable of being positively latched in place and able to withstand a minimum of a 500lb load while maintaining a minimum of a two to one (2:1) safety factor. There will also be a latch to keep the ladder in a vertical position at all times that will attach to a rung 28.00" below the primary attachment point. Strain gauging and testing will have been completed on the system (ladder and complete holding device) providing the above criteria has been met. A set of nylon guides will be provided to aid in positioning the roof ladder on the mounting brackets.

4.469.2 LyfeEye™ rappelling brackets will be provided. The LyfeEye brackets will be incorporated into the design of the 3-in-1 option brackets. Each bracket in the set will have a forged stainless steel eyebolt with a 1.38" inside diameter for use as a rappel line anchor. Each bracket will have a capacity of 300 lbs.

4.469.3 LyfeSupport™ rescue basket support bars will be provided. The bars will be incorporated into the design of the 3-in-1 option brackets. The bars will be easily removable from the 3-in-1 bracket to allow for individual storage of these bars when they are not needed. Two (2) quick clip basket straps will be used to secure the rescue basket to the brackets.

4.470 **AERIAL MOTION HOURMETER**: There will be an aerial in motion hour meter provided under the turntable console. The hour meter will be activated when the dead man switch is activated.

4.471 **SWITCH**: There will be a switch installed that will activate the Do Not Move Truck Indicator circuit when the battery switch is on, the turntable console cover is opened and the parking brake is released.

4.472 **AERIAL TURNTABLE MANSAVER™ BARS**: ManSaver™ bars will be installed at the aerial turntable.

4.473 **AERIAL WATERWAY**: The aerial waterway will be capable of being supplied by either a midship mounted pump or an external water source through a 5.00" intake at the rear of the apparatus.

4.473.1 A 5.00" water swivel will be installed below the aerial turntable permitting the ladder to rotate 360 degrees continuously.

4.473.2 A 5.00" water swivel will be installed at the aerial heel pivot pin that will permit water tower operations of -11.5 degrees to 76 degrees. The heel pivot pin will not be integral with the waterway swivel at any point. The waterway design will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

4.473.3 A telescoping aluminum waterway will be installed on the side of the aerial ladder sections. The waterway will consist of a 5.00" diameter tube for the base section, 4.50" diameter tube for the mid-section and 4.00" diameter tube for the fly section.

4.473.4 A 1.50" drain will be provided for the waterway with the control at the rear of the unit.

4.474 **WATERWAY SEALS**: The waterway seals will be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal will be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals will be internally lubricated.

4.474.1 The waterway seals will have automatic centering guides constructed of synthetic thermal polymer. The guides will provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

4.475 **PLATFORM WATER SYSTEM**: A 4.00" (internal diameter) water swivel will connect the fly section waterway to the platform waterway. The water swivel will permit water tower operations from -11.5 degrees to 76 degrees. The water will be routed from the swivel to a 4.00" gear operated butterfly valve on the front of the platform using a 4.00" 6061 pipe. The deluge gun will be bolted onto the butterfly valve.

4.475.1 A 2.50" preset pressure relief valve will be provided in the waterway system. It will be designed to protect the aerial waterway from excess pressure. It will dump water to the ground when operating.

4.475.2 A shower nozzle rated at 75 gpm will be provided beneath the platform for heat protection for the platform personnel. A direct linkage control for the shower nozzle will be provided.

4.475.3 One (1) - 2.50" preconnect will be provided at the front of the platform. The preconnect will be gated at the platform. The preconnect will be furnished with 2.50" NST threads and chrome plated cap.

4.476 AERIAL MONITOR: There will be two (2) Task Force Tips monitors provided at the platform.

4.476.1 One (1) will be a Y4-M21A-P double hand wheel controlled monitor with a TFT YST-4NN stacked tips.

4.476.2 One (1) will be Y4-E21A-P electric monitor with a TFT 2000 gpm Model M-ERP2000 electric nozzle.

4.476.3 The controls for the electronic monitor will be located at the platform and the turntable control console.

4.477 WATERWAY FLOWMETER: Waterway flow, including total water flowed, will be monitored by the microprocessor. An LCD display will be located at the upper and lower control stations.

4.478 REAR INLET: A 5.00" NST inlet to the aerial waterway will be provided at the rear of the apparatus, on the driver's side. It will be furnished with a 5.00" chrome plated adapter and a 5.00" rocker lug chrome plated cap.

4.479 AERIAL FLOW TEST WITH PITOT GAUGE: The end user will witness their aerial flow water while here for their final inspection. A Pitot gauge will also be utilized during the flow test as requested by the City.

4.480 MANUALS: The aerial manufacturer will provide two (2) operator maintenance manuals pertaining to the aerial device.

4.481 INITIAL INSTRUCTION: On initial delivery of the fire apparatus, the contractor will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period of three (3) consecutive days.

4.482 MAINTENANCE EDUCATION - Education will be provided to the City of San Antonio Fire Department services personnel at the Fire Department services facility. This education will cover items such as but not limited to Engine, transmission, suspension or aerial device maintenance or repair. The instructor(s) will be fully knowledgeable and have the full support of bidder Manufacturing to teach such education.

4.483 LOOSE EQUIPMENT - One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit will be provided at delivery.

4.484 PAINT - The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

4.484.1 Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.

4.484.2 Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.

4.484.3 Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.

4.484.4 Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.

4.484.5 Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when top coated.

4.484.6 Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.

4.484.7 Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacture.

4.484.8 Each batch of basecoat color is checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment is used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading is used to determine a good color match within each family color.

4.484.9 All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

4.484.10 Bidder paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) must meet or exceed the Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels meet or exceed the #6 A.C.T. standard in critical areas. These requirements are met in order for the exterior paint finish to be considered acceptable. The bidder written paint standards will be available upon request.

4.484.11 The cab will be two-tone, with the upper section painted #10 white along with a shield design on the cab face and lower section of the cab and body painted #90 red.

4.485 PAINT - ENVIRONMENTAL IMPACT - Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

4.485.1 Topcoats and primers will be chrome and lead free.

4.485.2 Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.

4.485.3 Particulate emission collection from sanding operations will have a 99.99% efficiency factor.

4.485.4 Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient

4.485.5 Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.

4.485.6 Paint wastes are disposed of in an environmentally safe manner.

4.485.7 Empty metal paint containers will be to recover the metal.

4.485.8 Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

4.485.9 Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

4.486 PAINT CHASSIS FRAME ASSEMBLY - The chassis frame assembly will be painted to match the lower job color before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that will be painted are:

4.486.1	Frame rails
4.486.2	Frame liners
4.486.3	Cross members
4.486.4	Axles
4.486.5	Suspensions
4.486.6	Steering gear
4.486.7	Battery boxes
4.486.8	Bumper extension weldment
4.486.9	Frame extensions
4.486.10	Body mounting angles
4.486.11	Rear Body support substructure (front and rear)
4.486.12	Pump house substructure
4.486.13	Air tanks
4.486.14	Fuel tank
4.486.15	Castings
4.486.16	Individual piece parts used in chassis and body assembly
4.486.17	Components treated with epoxy E-coat protection prior to paint:
4.486.18	Two (2) C-channel frame rails
4.486.19	Two (2) frame liners
4.486.20	The E-coat process will meet the technical properties shown.

4.487 PAINT, FRONT WHEELS - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red.

4.488 PAINT, REAR WHEELS - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red.

4.489 AERIAL DEVICE BOOM SUPPORT PAINT - The aerial device boom support will be painted job color to match lower body paint color.

4.490 FUEL TANK LABEL - The manufacturer's label on the fuel tank will be taped off so that it does not get painted.

4.491 COMPARTMENT INTERIOR PAINT - The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

4.492 AERIAL TURNTABLE PAINT COLOR - All aerial device ladder components above the rotation point that are not chrome plated or stainless steel will have a natural swirl finish. All buy out components, such as monitor, nozzle, gauges, etc. will be supplied as received from the vendor. Turntable, console, lift cylinders, and extension cylinders will be sanded to remove any metal flakes and smooth any rough surfaces. These components will be prime painted with an epoxy primer and finished painted with a durable white 10 high quality paint (manufacturer's standard brand). The support structure, rotation motor, components below the rotation point, and the stabilizers will be painted high gloss black. The tip of the ladder will be painted a contrasting color for high visibility.

4.493 REFLECTIVE STRIPES - Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

4.494 CHEVRON STRIPING ON THE FRONT BUMPER - There will be alternating chevron striping located on the front bumper. The colors will be red and fluorescent yellow green diamond grade. The size of the striping will be 6.00".

4.495 REAR CHEVRON STRIPING - There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the rear wall, aluminum doors, and rear bumper. Rear compartment doors and stainless steel access doors will not be covered.

- **4.495.1** The colors will be red and fluorescent yellow green diamond grade.
- **4.495.2** Each stripe will be 6.00" in width.
- **4.495.3** This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

4.496 REFLECTIVE STRIPE ON STABILIZERS -There will be 4.00" wide alternating red diamond grade and fluorescent yellow green diamond grade reflective chevron stripes provided on the forward and rear facing sides of all four (4) aerial stabilizers. The stripes will be angled at a 45 degree angle.

4.497 JOG(S) IN REFLECTIVE BAND - The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

4.498 REFLECTIVE STRIPE INSIDE RUBRAILS - A reflective stripe will be provided inside the extruded aluminum rub rails. The reflective material will be red (tomato red). There will be a quantity of ten (10) rub rails striped.

4.499 INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS - There will be alternating chevron striping located on the inside of each cab and crew cab door. The striping will consist of the following colors:

- **4.499.1** The first color will be red diamond grade
- **4.499.2** The second color will be fluorescent yellow green diamond grade
- **4.499.3** The size of the striping will be 4.00".

4.500 LETTERING - Twenty-one (21) to forty (40) reflective lettering, 3.00" high, with [Outline, Lettering] will be provided.

4.501 LETTERING/NUMERALS ON CAB GRILLE - Up to six (6) painted letters/numerals with outline, as determined by the fire department, will be provided on the cab grille.

4.502 LETTERING/NUMERALS ON CAB GRILLE - Three (3) painted letters/numerals with outline, as determined by the fire department, will be provided on the cab grille.

4.503 LETTERING/NUMERALS ON CAB GRILLE - Up to six (6) painted letters/numerals with outline, as determined by the fire department, will be provided on the cab grille.

4.504 FIRE APPARATUS PARTS USB MANUAL - There will be two (2) custom parts manuals for the complete fire apparatus provided in USB format with the completed unit. The manuals will contain the following:

- **4.504.1** Job number
- **4.504.2** Part numbers with full descriptions
- **4.504.3** Table of contents
- **4.504.4** Parts section sorted in functional groups reflecting a major system, component, or assembly
- **4.504.5** Parts section sorted in alphabetical order
- **4.504.6** Instructions on how to locate parts
- **4.504.7** The manuals will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

4.505 SERVICE PARTS INTERNET SITE - The service parts information included in these manuals are also available on the factory website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

4.506 CHASSIS SERVICE USB MANUALS - There will be two (2) USB format chassis service manuals containing parts and service information on major components provided with the completed unit.

4.506.1 The manual will contain the following sections:
4.506.2 Job number
4.506.3 Table of contents
4.506.4 Troubleshooting
4.506.5 Front Axle/Suspension
4.506.6 Brakes
4.506.7 EngineTires
4.506.8 Wheels
4.506.9 Cab
4.506.10 Electrical, DC
4.506.11 Air Systems
4.506.12 Plumbing
4.506.13 Appendix
4.506.14 The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

4.507 CHASSIS OPERATION USB MANUALS - There will be two (2) USB format chassis operation manuals provided.

4.507.1 Software - Software to maintain the apparatus will be included in purchase. This will include items such as (but not limited to) software for Detroit Diesel, Allison Transmission and Wabco systems.

4.508 VEHICLE STABILITY CERTIFICATION - The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

4.509 ENGINE INSTALLATION CERTIFICATION - The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of bid.

4.510 POWER STEERING CERTIFICATION - The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

4.511 CAB INTEGRITY CERTIFICATION - The fire apparatus manufacturer will provide a cab integrity certification with this proposal. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

4.511.1 European Occupant Protection Standard ECE Regulation No.29.

4.511.2 SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

4.511.3 SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

4.511.4 Roof Crush

4.511.5 The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

4.511.6 Additional Roof Crush

4.511.7 The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

4.511.8 Side Impact - The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

4.511.9 Frontal Impact - The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

4.511.10 Additional Frontal Impact - The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420). The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

4.512 CAB DOOR DURABILITY CERTIFICATION - Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

4.513 WINDSHIELD WIPER DURABILITY CERTIFICATION -Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

4.514 ELECTRIC WINDOW DURABILITY CERTIFICATION - Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

4.515 SEAT BELT ANCHOR STRENGTH - Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

4.516 SEAT MOUNTING STRENGTH - Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

4.517 CAB DEFROSTER CERTIFICATION - Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure and Performance Requirements - Trucks, Buses, and Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

4.518 CAB AIR CONDITIONING PERFORMANCE CERTIFICATION - Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 67 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar air conditioning system has been tested and has met these criteria. The certification will be available at the time of delivery.

4.519 AMP DRAW REPORT - The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system. The manufacturer of the apparatus will provide the following:

4.519.1 Documentation of the electrical system performance tests.

4.519.2 A written load analysis, which will include the following:

- **a.** The nameplate rating of the alternator per applicable NFPA 1901 or 1906 (Current Edition).
- **b.** The minimum continuous load of each component that is specified per applicable NFPA 1901 or 1906 (Current Edition).
- **c.** Additional loads that, when added to the minimum continuous load, determine the total connected load.
- **d.** Each individual intermittent load.
- **e.** All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

4.520 EMS COMPARTMENTS – The rear facing EMS compartments will be stacked side by side by side, secured to each other with bolts to prevent rattling. The center compartment and driver's side compartment will be moved off center towards the passenger's side to allow them to all be tight together.

4.521 ELECTRICAL REQUIREMENTS – All electrical components will be mounted above the frame rails. Nothing should be hanging below the frame rails.

4.522 There will be an aluminum cover installed around the components to help deflect water and steam.

4.523 PUMP HOUSE PERIMETER LIGHTS - There will be one (1) Amdor LumaBar H2O™, Model AY-9500-012, 12.00" LED weatherproof strip lights with brackets provided under the passenger's side pump panel running boards. The lights will be controlled by the same means as the body perimeter lights.

4.524 ADDITIONAL LOOSE EQUIPMENT – In addition to aerial ladder with platform the bidder will provide the following equipment to meet SAFD specifications.

4.524.1 Zoll brand x series 12 lead monitor with attachments
4.524.2 Four (4) 3M Scott SCBA X3 Air Pack with bottle
4.524.3 Paratech brand Vehicle Stabilization Kit
4.524.4 Two (2) Rescue positive pressure ventilation fans
4.524.5 Milwaukee Brand 16 inch Rescue Saw
4.524.6 Milwaukee Brand K2 Saw
4.524.7 Bullard Thermal Imaging Camera Truck Series TIC
4.524.8 Hurst jaws of life s 799 e3 connect cutter
4.524.9 Hurst jaws of life sp 777 e3 connect spreader
4.524.10 Hurst jaws of life r 522 e3 connect ram

4.525 LOOSE EQUIPMENT DELIVERY – all additional loose equipment will be shipped to Fire Department Facilities to arrive simultaneously with the new apparatus.

005 - SUPPLEMENTAL TERMS & CONDITIONS

Original Contract Term.

This contract shall begin upon the effective date of the ordinance awarding the contract, or date specified in the award letter if this contract does not exceed $50,000.00. This contract shall terminate upon completion of all work described herein or delivery of all goods ordered, as applicable

Cooperative Contract Provisions.

Term Consistent with Cooperative Contract. Notwithstanding anything to the contrary herein, no new orders may be placed hereunder after the expiration or termination of the underlying cooperative contract. Renewals cannot extend beyond the term of the underlying cooperative contract. Extensions cannot extend beyond the term of the underlying cooperative contract.

Contract Documents. The terms and conditions for performance and payment of compensation for this contract are set forth in the following contract documents, true and correct copies of which are attached hereto and fully incorporated herein for all purposes:

This Request for Offer, including any attachments identified herein and addenda issued by City prior to acceptance of an offer from Offeror;

Any Purchase Orders Issued hereunder by City of San Antonio ("City"); and

Exhibit I – All applicable terms and conditions of the Cooperative Purchasing Contract number FS12-19 through Houston-Galveston Area Council (H-GAC) Cooperative Program.

Order of Priority of Contract Documents. Should a conflict arise among the provisions of the contract documents, this RFO and any Purchase Order issued hereunder shall govern over Exhibit I, unless otherwise specifically provided herein.

This RFO includes the following: Instructions to Offerors, General Terms and Conditions, Supplemental Terms and Conditions, Product Specifications and Description of Services, Definitions, Price Schedule, any Attachments identified herein.

Warranty.

The warranty specified in Exhibit 1, if any, a minimum of 90-days product guarantee or the manufacturer's standard commercial warranty, whichever is greater, shall apply to all products and/or services purchased under this RFO, unless otherwise specified in the Specifications/Scope of Services section of this RFO. This warranty shall provide for replacement of defective merchandise, parts, and labor, and shall include pick-up of the defective merchandise from City and delivery of the replacement(s) to the same location. The warranty shall be effective from the date of acceptance of the merchandise, or completion of the service, as applicable.

Rejection of Disclaimers of Warranties & Limitations Of Liability.

ANY TERM OR CONDITION IN EXHIBIT I, OR IN ANY DOCUMENT FURNISHED BY VENDOR, DISCLAIMING THE IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR ATTEMPTING TO LIMIT VENDOR'S LIABILITY SHALL BE OF NO FORCE OR EFFECT, AND SHALL BE STRICKEN FROM THE CONTRACT DOCUMENTS AS IF NEVER CONTAINED THEREIN.

Insurance.

Vendor must provide a completed Certificate(s) of Insurance to CITY's Finance Department. The certificate must be:

- clearly labeled with the legal name of the event in the Description of Operations block;
- completed by an agent and signed by a person authorized by the insurer to bind coverage on its behalf (CITY will not accept Memorandum of Insurance or Binders as proof of insurance); and
- properly endorsed and have the agent's signature, and phone number.

Certificates may be mailed or sent via email, directly from the insurer's authorized representative. CITY shall have no duty to pay or perform under this Agreement until such certificate and endorsements have been received and approved by CITY'S Finance Department. No officer or employee, other than CITY'S Risk Manager, shall have authority to waive this requirement.

If the City does not receive copies of insurance endorsement, then by executing this Agreement, Vendor certifies and represents that its endorsements do not materially alter or diminish the insurance coverage for the Event.
The City's Risk Manager reserves the right to modify the insurance coverages, their limits, and deductibles prior to the scheduled event or during the effective period of this Agreement based on changes in statutory law, court decisions, and changes in the insurance market which presents an increased risk exposure.
Vendor shall obtain and maintain in full force and effect for the duration of this Agreement, at Vendor's sole expense, insurance coverage written on an occurrence basis, by companies authorized and admitted to do business in the State of Texas and with an A.M. Best's rating of no less than A- (VII), in the following types and for an amount not less than the amount listed below. If the Vendor claims to be self-insured, they must provide a copy of their declaration page so the CITY can review their deductibles:

TYPE	AMOUNTS
1. Workers' Compensation 2. Employers' Liability	Statutory $1,000,000/$1,000,000/$1,000,000
3. Commercial General Liability Insurance to include coverage for the following: a. Premises/Operations b. Products/Completed Operations c. Personal/Advertising Injury d. Contractual Liability e. Independent Contractors f. Damage to property rented by you	For Bodily Injury and Property Damage of $1,000,000 per occurrence; $2,000,000 General Aggregate, or its equivalent in Umbrella or Excess Liability Coverage
4. Business Automobile Liability a. Owned/leased vehicles b. Non-owned vehicles c. Hired Vehicles	Combined Single Limit for Bodily Injury and Property Damage of $1,000,000 per occurrence
*5.Products liability	$1,000,000 per occurrence; $2,000,000 general aggregate, or its equivalent in Umbrella or Excess Liability Coverage.
*If Applicable	

Vendor must require, by written contract, that all subcontractors providing goods or services under this Agreement obtain the same insurance coverages required of Vendor and provide a certificate of insurance and endorsement that names Vendor and CITY as additional insureds. Vendor shall provide CITY with subcontractor certificates and endorsements before the subcontractor starts work.

If a loss results in litigation, then the CITY is entitled, upon request and without expense to the City, to receive copies of the policies, declaration page and all endorsements. Vendor must comply with such requests within 10 days by submitting the requested insurance documents to the CITY at the following address:

City of San Antonio
Attn: Finance Department-Purchasing Division
P.O. Box 839966
San Antonio, Texas 78283-3966

Vendor's insurance policies must contain or be endorsed to contain the following provisions:

- Name CITY and its officers, officials, employees, volunteers, and elected representatives as additional insureds by endorsement, as respects operations and activities of, or on behalf of, the named insured performed under contract with CITY. The endorsement requirement is not applicable for workers' compensation and professional liability policies.

- Endorsement that the "other insurance" clause shall not apply to CITY where CITY is an additional insured shown on the policy. CITY's insurance is not applicable in the event of a claim.

- Contractor shall submit a waiver of subrogation to include, workers' compensation, employers' liability, general liability and auto liability policies in favor of CITY; and

- Provide 30 days advance written notice directly to CITY of any suspension, cancellation, non-renewal or materials change in coverage, and not less than ten (10) calendar days advance written notice for nonpayment of premium.

Within five (5) calendar days of a suspension, cancellation, material change in coverage, or non-renewal of coverage, Vendor shall provide a replacement Certificate of Insurance and applicable endorsements to CITY. CITY shall have the option to suspend Vendor's performance should there be a lapse in coverage at any time during this Agreement. Failure to provide and to maintain the required insurance shall constitute a material breach of this Agreement.

In addition to any other remedies CITY may have upon Vendor's failure to provide and maintain any insurance or policy endorsements to the extent and within the time required, CITY may order Vendor to stop work and/or withhold any payment(s) which become due to Vendor under this Agreement until Vendor demonstrates compliance with requirements.

Nothing contained in this Agreement shall be construed as limiting the extent to which Vendor may be held responsible for payments of damages to persons or property resulting from Vendor's or its subcontractors' performance of the work covered under this Agreement.

Vendor's insurance shall be deemed primary and non-contributory with respect to any insurance or self - insurance carried by City for liability arising out of operations under this Agreement.

The insurance required is in addition to and separate from any other obligation contained in this Agreement and no claim or action by or on behalf of City shall be limited to insurance coverage provided.

Vendor and any subcontractor are responsible for all damage to their own equipment and/or property result from their own negligence.

Incorporation of Attachments.

Each of the attachments listed below is an essential part of this contract, which governs the rights and duties of the parties, incorporated herein by reference, and shall be interpreted in the order of priority as appears below, with this document taking priority over all attachments:

Attachment A – Price Schedule
Attachment B – Veteran-Owned Small Business Preference Program Tracking Form
Exhibit I – H-GAC Coop Contract # FS 12-19

Electronic Offer Equals Original. If Vendor is submitting an electronic offer, City and Vendor each agree that this transaction may be conducted by electronic means, as authorized by Chapter 322, Texas Business & Commerce Code, known as the Electronic Transactions Act.

Delivery of Goods/Services.

Destination Contract. Vendor shall deliver all goods and materials F.O.B., City of San Antonio's designated facility, inside delivery, freight prepaid, to the address provided in this RFO or, if different, in the Purchase Order. Vendor shall bear the risk of loss until delivery. Freight charges will be paid only when expedited delivery is requested and approved in writing by City. Vendor shall be responsible for furnishing necessary personnel or equipment and/or making necessary arrangements to off load at City of San Antonio facility, unless otherwise noted herein.

Failure to Deliver. When delivery is not met as provided for in the contract, City may make the purchase on the open market, with any cost in excess of the contract price paid by Vendor, in addition to any other direct, indirect, consequential or incidental damages incurred by City as a result thereof. In addition, Vendor may be removed from City's list of eligible bidders.

Purchase Orders. Each time a City department wishes to place an order against this contract, it will issue Vendor a purchase order. Vendor must have the purchase order before making any delivery.

Acceptance by City. City shall have a reasonable time (but not less than 30 days) after receipt to inspect the goods and services tendered by Vendor. City at its option may reject all or any portion of such goods or services which do not, in City's sole discretion, comply in every respect with all terms and conditions of the contract. City may elect to reject the entire goods and services tendered even if only a portion thereof is nonconforming. If City elects to accept nonconforming goods and services, City, in addition to its other remedies, shall be entitled to deduct a reasonable amount from the price thereof to compensate City for the nonconformity. Any acceptance by City, even if non-conditional, shall not be deemed a waiver or settlement of any defect in such goods and services.

Testing. After award of contract, City may, at its sole option, test the product delivered to ensure it meets specifications. Initial testing shall be at City's expense. However, if the product does not to meet specifications, Vendor shall reimburse City for the costs of testing. City may withhold the cost of testing from any amounts owed to Vendor under this or any other contract, or invoice Vendor for same. If invoiced, Vendor shall pay City within 30 calendar days' of the invoice.

Invoicing and Payment.

Invoice Submissions. City requires all original first time invoices to be submitted directly to the Accounts Payable section of the Finance Department. The preferred method of delivery is electronically to the following e-mail address:

accounts.payable@sanantonio.gov

Invoices submitted electronically to the e-mail address above must be in separate .pdf format file. Multiple invoices cannot be submitted in a single .pdf file; however, Vendor may submit multiple, separate invoice files in a single e-mail. Any required documentation in support of the invoice should be compiled directly behind the invoice in the same .pdf file. Each electronically submitted file must have a unique identifying name that is not the same as any other file name.

Invoices submitted by electronic submission are only considered "original" when the submission comes directly from the Vendor to Accounts Payable using this e-mail address. Vendor may courtesy copy the ordering City department personnel on the e-mail.

Vendors not able to submit invoices with the required file formatting above may mail original invoices, on white paper only, to: City of San Antonio, Attn: Accounts Payable, P.O. Box 839976, San Antonio, Texas 78283-3976.

Information Required On Invoice.

All invoices must be in a form and content approved by the City. City may require modification of invoices if necessary in order to satisfy City that all billing is proper and pursuant to the terms of the contract. Invoices are required to show each City Purchase Order Number. Invoices must be legible. Items billed on invoices must be specific as to applicable stock, manufacturer, catalog or part number (if any). All invoices must show unit prices for each item being billed, the quantity of items being billed and the total for each item, as well as the total for all items on the invoice. If prices are based on list prices basis, then the list prices, the percentage discount or percentage surcharge, net unit prices, extensions and net total prices must be shown. Prompt payment discounts offered shall be shown separately on the invoice.

Payment by City.

In accordance with the Texas Prompt Payment Act, City shall have not less than 30 days to pay for goods or services. Time for payment, including payment under discount terms, will be computed from the later of: (1) the date City receives conforming goods under the contract; (2) the date performance of the service under the contract is completed; or (3) the date City receives a correct and valid invoice for the goods or services. Payment is deemed to be made on the date of mailing of the check. Payment is made in US dollars only.

This provision shall not apply where there is a bona fide dispute between City and Vendor about the goods delivered or the service performed that causes the payment to be late, or where the invoice is not mailed to the address provided herein.

The payment amount due on invoices may not be manually altered by City personnel. Once disputed items are reconciled, Vendor must submit a corrected invoice or a credit memorandum for the disputed amount.

NECESSITY OF TIMELY INVOICE / WAIVER OF PAYMENT. NOTWITHSTANDING THE FORGOING, CITY CANNOT PAY FOR ANY GOODS OR SERVICES WITHOUT AN INVOICE. VENDOR MUST INVOICE CITY NO LATER THAN 90 CALENDAR DAYS FROM THE DATE GOODS ARE DELIVERED OR SERVICES RENDERED. FAILURE TO SUBMIT AN INVOICE WITHIN SAID 90 DAY SHALL NEGATE ANY LIABILITY ON THE PART OF CITY AND CONSTITUTE A **WAIVER** BY VENDOR OF ANY AND ALL RIGHT OR CLAIMS TO COLLECT MONEYS THAT VENDOR MAY RIGHTFULLY BE OTHERWISE ENTITLED TO FOR GOODS OR SERVICES PERFORMED.

The total price for all goods and/or services is shown on the Price Schedule. No additional fees or expenses of Vendor shall be charged by Vendor nor be payable by City. The parties hereby agree that all compensable expenses of Vendor are shown on the Price Schedule. If there is a discrepancy on the Price Schedule between the unit price for an item, and the extended price, the unit price shall govern.

Amendments. Except where the terms of this contract expressly provide otherwise, any alterations, additions, or deletions to the terms hereof, shall be effected by amendment, in writing, executed by both City and Vendor. The Director of the Purchasing and General Services Department, or Director's designee, shall have authority to execute amendments on behalf of City without further action by the San Antonio City Council, subject to and contingent upon appropriation of funds for any increase in expenditures by City.

Termination.

Termination-Breach. Should vendor fail to fulfill in a timely and proper manner, as determined solely by the Director, its material obligations under this contract, or violate any of the material terms of this contract, City shall have the right to immediately terminate the contract in whole or in part. Notice of termination shall be provided in writing to the Vendor, effective upon the date set forth in the notice. City may, in City's sole discretion, provide an opportunity for Vendor to cure the default. If City elects to offer an opportunity to cure, City shall provide notice to Vendor specifying the matters in default and the cure period. If Vendor fails to cure the default within the cure period, City shall have the right, without further notice, to terminate the contract in whole or in part. Such termination shall not relieve Vendor of any liability to the City for damages sustained by virtue of any breach by Vendor.

Termination-Notice. City may terminate this contract, in whole or in part, without cause. City shall be required to give Vendor notice ten days prior to the date of termination of the contract without cause.

Termination-Funding. City retains the right to terminate this contract at the expiration of each of City's budget periods. This contract is conditioned on a best efforts attempt by City to obtain and appropriate funds for payment of any debt due by City herein.

Termination by City may be effected by Director, without further action by the San Antonio City Council.

Independent Contractor. Vendor covenants and agrees that it is an independent contractor and not an officer, agent, servant or employee of City. City shall not be liable for any claims which may be asserted by any third party occurring in connection with the services to be performed by Vendor under this contract and that Vendor has no authority to bind City. The doctrine of respondeat superior shall not apply as between City and Vendor.

INDEMNIFICATION.

VENDOR covenants and agrees to FULLY INDEMNIFY, DEFEND and HOLD HARMLESS, CITY and the elected officials, employees, officers, directors, volunteers and representatives of CITY, individually and collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death and property damage, made upon CITY directly or indirectly arising out of, resulting from or related to VENDOR'S activities under this Agreement, including any acts or omissions of VENDOR, any agent, officer, director, representative, employee, consultant or subcontractor of VENDOR, and their respective officers, agents employees, directors and representatives while in the exercise of the rights or performance of the duties under this Agreement. The indemnity provided for in this paragraph shall not apply to any liability resulting from the negligence of CITY, its officers or employees, in instances where such negligence causes personal injury, death, or property damage. IN THE EVENT VENDOR AND CITY ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY SHALL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS FOR THE STATE OF TEXAS, WITHOUT, HOWEVER, WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. In addition, Vendor agrees to indemnify, defend, and hold City harmless from any claim involving patent infringement, trademarks, trade secrets, and copyrights on goods supplied.

The provisions of this INDEMNITY are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity. VENDOR shall advise CITY in writing within 24 hours of any claim or demand against CITY or VENDOR known to VENDOR related to or arising out of VENDOR's activities under this AGREEMENT and shall see to the investigation and defense of such claim or demand at VENDOR's cost. CITY shall have the right, at its option and at its own expense, to participate in such defense without relieving VENDOR of any of its obligations under this paragraph.

Assignment. Except as otherwise stated herein, Vendor may not sell, assign, pledge, transfer or convey any interest in this contract, nor delegate the performance of any duties hereunder, by transfer, by subcontracting or any other means, without the consent of Director. As a condition of such consent, if such consent is granted, Vendor shall remain liable for completion of the services and provision of goods outlined in this contract in the event of default by the successor vendor, assignee, transferee or subcontractor. Any attempt to transfer, pledge or otherwise assign this Contract without said written approval, shall be void ab initio and shall confer no rights upon any third person.

Ownership of Documents. Pursuant to Texas Local Government Code Chapter 201, any and all Records produced by Vendor pursuant to the provisions of this contract are the exclusive property of City; and no such Record shall be the subject of any copyright or proprietary claim by Vendor. The term "Record" as used herein shall mean any document, paper, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or characteristic. Vendor understands and acknowledges that as the exclusive owner of any and all such Records, City has the right to use all such Records as City desires, without restriction.

Records Retention.

Vendor and its subcontractors, if any, shall properly, accurately and completely maintain all documents, papers, and records, and other evidence pertaining to the services rendered hereunder ("Documents"), and shall make such Documents available to City at their respective offices, at all reasonable times and as often as City may deem necessary during the contract period, including any extension or renewal hereof, and the record retention period established herein, for purposes of audit, inspection, examination, and making excerpts or copies of same by City and any of its authorized representatives.

Vendor shall retain any and all Documents produced as a result of services provided hereunder for a period of four years ("Retention Period") from the date of termination of the contract. If, at the end of the Retention Period, there is litigation or other questions arising from, involving or concerning these Documents or the services provided hereunder, Vendor shall retain the records until the resolution of such litigation or other such questions. Vendor acknowledges and agrees that City shall have access to any and all such Documents at any and all times, as deemed necessary by City, during said Retention Period. City may, at its election, require Vendor to return the documents to City at Vendor's expense prior to or at the conclusion of the Retention Period. In such event, Vendor may retain a copy of the documents.

Vendor shall notify City, immediately, in the event Vendor receives any requests for information from a third party, which pertain to the Documents referenced herein. Vendor understands and agrees that City will process and handle all such requests.

S.B. 943 – Disclosure Requirements for Certain Government Contracts. For contracts (1) with a stated expenditure of at least $1 million in public funds for the purchase of goods or services by the City, or (2) that result in the expenditure of at least $1 million in public funds for the purchase of goods or services by the City in a given fiscal year, Vendor acknowledges that the requirements of the Texas Public Information Act, Government Code, Chapter 552, Subchapter J, pertaining to the preservation and disclosure of Contracting Information maintained by the City or sent between the City and a vendor, contractor, potential vendor, or potential contractor, may apply to this offer and any resulting contract. Vendor agrees that the contract can be terminated if Vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

By submitting an Offer, Offeror warrants and certifies, and a contract awarded pursuant to this RFO is made in reliance thereon, that it, has not knowingly or intentionally failed to comply with this subchapter in a previous offer or contract. City hereby relies on Vendor's certification, and if found to be false, City may reject the offer or terminate the Contract for material breach.

Severability. If any clause or provision of this contract is held invalid, illegal or unenforceable under present or future federal, state or local laws, including but not limited to the City Charter, City Code, or ordinances of the City of San Antonio, Texas, then and in that event it is the intention of the parties hereto that such invalidity, illegality or unenforceability shall not affect any other clause or provision hereof and that the remainder of this contract shall be construed as if such invalid, illegal or unenforceable clause or provision was never contained herein. It is also the intention of the parties hereto that in lieu of each clause or provision of this contract that is invalid, illegal, or unenforceable, there be added as a part of the contract a clause or provision as similar in terms to such invalid, illegal or unenforceable clause or provision as may be possible, legal, valid and enforceable.

Compliance with Law. Vendor shall provide and perform all services required under this Agreement in compliance with all applicable federal, state and local laws, rules and regulations.

Certifications. Vendor warrants and certifies that Vendor and any other person designated to provide services hereunder has the requisite training, license and/or certification to provide said services, and meets all competence standards promulgated by all other authoritative bodies, as applicable to the services provided herein.

Non-waiver of Performance. Unless otherwise specifically provided for in this Agreement, a waiver by either Party of a breach of any of the terms, conditions, covenants or guarantees of this Agreement shall not be construed or held to be a waiver of any succeeding or preceding breach of the same or any other term, condition, covenant or guarantee herein contained. Further, any failure of either Party to insist in any one or more cases upon the strict performance of any of the covenants of this Agreement, or to exercise any option herein contained, shall in no event be construed as a waiver or relinquishment for the future of such covenant or option. In fact, no waiver, change, modification or discharge by either party hereto of any provision of this Agreement shall be deemed to have been made or shall be effective unless expressed in writing and signed by the party to be charged. No act or omission by a Party shall in any manner impair or prejudice any right, power, privilege, or remedy available to that Party hereunder or by law or in equity, such rights, powers, privileges, or remedies to be always specifically preserved hereby.

Venue. Venue of any court action brought directly or indirectly by reason of this contract shall be in Bexar County, Texas. This contract is made and is to be performed in Bexar County, Texas, and is governed by the laws of the State of Texas.

Non-discrimination. As a condition of entering into this agreement, Vendor represents and warrants that it will comply with City's Commercial Nondiscrimination Policy, as described under Section III.C.1 of the SBEDA Ordinance. As part of such compliance, Vendor shall not discriminate on the basis of race, color, religion, ancestry or national origin, sex, age, marital status, sexual orientation, or on the basis of disability or other unlawful forms of discrimination in the solicitation, selection, hiring or commercial treatment of subcontractors, vendors, suppliers, or commercial customers, nor shall Vendor retaliate against any person for reporting instances of such discrimination. Vendor shall provide equal opportunity for subcontractors, vendors and suppliers to participate in all of its public sector and private sector subcontracting and supply opportunities, provided that nothing contained in this clause shall prohibit or limit otherwise lawful efforts to remedy the effects of marketplace discrimination that have occurred or are occurring in the City's Relevant Marketplace. Vendor understands and agrees that a material violation of this clause shall be considered a material breach of this agreement and may result in termination of this agreement, disqualification of Vendor from participating in City contracts, or other sanctions. This clause is not enforceable by or for the benefit of, and creates no obligation to, any third party. Vendor shall include this nondiscrimination clause in all subcontracts for the performance of this contract.

As a party to this contract, Vendor understands and agrees to comply with the *Non-Discrimination Policy* of the City of San Antonio contained in Chapter 2, Article X of the City Code and further, shall not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, veteran status, age or disability, unless exempted by state or federal law, or as otherwise established herein.

Attorney's Fees. The Parties hereto expressly agree that, in the event of litigation, each party hereby waives its right to payment of attorneys' fees.

State Prohibitions on Contracts:

This section only applies to a contract that:

(1) is between a governmental entity and a company with 10 or more full-time employees; and

(2) has a value of $100,000 or more that is to be paid wholly or partly from public funds of the governmental entity.

"Company" means a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit. This term does not include a sole proprietorship.

Prohibition on Contracts with Companies Boycotting Israel.

Texas Government Code §2271.002 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract.

"Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not boycott Israel, and will not boycott Israel during the term of the contract. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

Prohibition on Contracts with Companies Boycotting Certain Energy Companies.

In accordance with SB 13, effective September 1, 2021, Texas Government Code §2274 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract.

"Boycott energy company" means, without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (A) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (B) does business with a company described in (A).

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not boycott energy companies and will not boycott energy companies during the term of the contract. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

Prohibition on Contracts with Companies that Discriminate Against Firearm and Ammunition Industries.

In accordance with SB 19, effective September 1, 2021, Texas Government Code §2274 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association.

"Discriminate against a firearm entity or firearm trade association": (A) means, with respect to the entity or association, to: (i) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (ii) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (iii) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association.

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and will not discriminate during the term of the contract against a firearm entity or firearm trade association. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

CONTRACTS WITH COMPANIES ENGAGED IN BUSINESS WITH IRAN, SUDAN, OR FOREIGN TERRORIST ORGANIZATIONS PROHIBITED. Texas Government Code §2252.152 provides that a governmental entity may not enter into a governmental contract with a company that is identified on a list prepared and maintained under Texas Government Code §§2270.0201 or 2252.153. Vendor hereby certifies that it is not identified on such a list. City hereby relies on Vendor's certification. If found to be false, or if Vendor is identified on said list during the course of its contract with City, City may terminate the Contract for material breach.

Delinquent Taxes. In the event that Vendor is or subsequently becomes delinquent in the payment of taxes owed to the City of San Antonio, City reserves the right to deduct any delinquent taxes from payments that City may owe to the delinquent Vendor as a result of this contract.

Binding Contract. This contract shall be binding on and inure to the benefit of the parties hereto and their respective heirs, executors, administrators, legal representatives, and successors and assigns, except as otherwise expressly provided for herein.

Entire Agreement. This contract, including City's final electronically posted online version, together with its authorizing ordinance, and its price schedule(s), addendums, attachments, purchase orders, and exhibits, if any, constitutes the final and entire agreement between the parties hereto and contains all of the terms and conditions agreed upon. No other agreements, oral or otherwise, regarding the subject matter of this contract shall be deemed to exist or to bind the parties hereto, unless same be in writing, dated subsequent to the date hereof, and be duly executed by the parties, in accordance with the Amendment provision herein. **Parties agree that City's final electronically posted online version of this solicitation contains the agreed upon specifications, scope of services, and terms and conditions of this contract, and shall control in the event of a conflict with any printed version signed and submitted by Vendor.**

007 - SIGNATURE PAGE

By submitting an offer, Offeror represents that:

(s)he is authorized to bind Offeror to fully comply with the terms and conditions of City's Request for Offer for the prices stated therein;

(s)he has read the entire document, including the final version issued by City, and agreed to the terms therein;

Offeror is in good standing with the Texas State Comptroller's Office; and

to the best of his/her knowledge, all information is true and correct.

Complete the following and sign on the signature line below. Failure to sign and submit this Signature Page will result in rejection of your offer.

Offeror Information:

Please Print or Type:

Vendor ID No.:	COS Supplier Number 10027925
Signer's Name:	Travis Walden
Name of Business:	Siddons-Martin Emergency Group
Street Address:	1362 E. Richey Rd
City, State, Zip Code:	Houston, TX 77073
Email Address:	travis.walden@siddons-martin.com
Telephone No.:	512-848-5847
Fax No.:	281-442-9026
City's Solicitation No.:	6100016339

Signature of Person Authorized to Sign Offer

008 - STANDARD DEFINITIONS

Whenever a term defined by the Uniform Commercial Code ("UCC"), as enacted by the State of Texas, is used in the Contract, the UCC definition shall control, unless otherwise defined in the Contract.

All-or-None Offer - an RFO in which City will award the entire contract to one offeror only.

Alternate Offer - two or more offers with substantive variations in the item or service offered from the same offeror in response to a solicitation.

Assignment - a transfer of claims, rights or interests in goods, services or property.

Bid Bond - security to ensure that Offeror (a) will not withdraw the offer within the period specified for acceptance, and (b) will furnish any required bonds and any necessary insurance within the time specified in the solicitation.

City - the City of San Antonio, a Texas home-rule municipal corporation.

Contractor - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

Director – the Director of City's Finance Department, Purchasing Division, or Director's designee.

Line Item - a listing of items in an offer for which an offeror is expected to provide separate pricing.

Offer - a complete, signed response to an RFO that, if accepted, would bind Offeror to perform the resultant contract.

Offeror - a person, firm or entity that submits an offer in response to a solicitation. The offeror whose offer is accepted by City may also be referred to herein as Contractor, Vendor or Supplier.

Payment Bond - a particular form of security provided by the contractor to protect City against loss due to the contractor's failure to pay suppliers and subcontractors.

Performance Bond - a particular form of security provided by the contractor to protect City against loss due to the contractor's inability or unwillingness to complete the contract as agreed.

Performance Deposit - security provided by the contractor to protect City against loss due to the contractor's inability or unwillingness to complete the contract as agreed.

Pre-Submittal Conference - a meeting conducted by City, held in order to allow offerors to ask questions about the proposed contract and particularly, the contract specifications.

Purchase Order - a validly issued order placed by an authorized City department for the purchase of goods or services, written on City's standard purchase order form, and which is the vendor's authority to deliver to and invoice City for the goods or services specified in an RFO for the price stated in vendor's offer.

Specifications - a description of what City requires and what Offeror must offer; a description of the physical or functional characteristics of a product or material, or the nature of a service or construction item.

Subcontractor - a person, firm or entity providing goods or services to a vendor to be used in the performance of the vendor's obligations under the contract with City.

Supplier - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

Vendor - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

009 – ATTACHMENTS

ATTACHMENT A – PRICE SCHEDULE

ITEM	QUANTITY	DESCRIPTION
1	1	Pierce Velocity Platform Ladder

PRICE EACH: $ 1,993,819.00

TOTAL: $ 1,993,819.00

YEAR, MAKE & MODEL OFFERED:

2025 or 2026 Pierce Velocity Aerial (whatever is current at the time of build)

SPECIFIC MAKE & MODEL OF MOTOR OFFERED (INCLUDE SAE NET HP):

Paccar MX13 - 510 HP

TRANSMISSION OFFERED:

Allison EVS 4500

VEHICLE WARRANTY:

1 Year

WARRANTY SERVICE PROVIDER FACILITY NAME:

'Siddons-Martin Emergency Group - Kirby

WARRANTY SERVICE PROVIDER FACILITY ADDRESS:

5511 Binz-Engleman Rd

San Antonio, TX 78219

DELIVERY WILL BE MADE WITHIN 1095 CALENDER DAYS AFTER ISSUANCE OF PURCHASE ORDER.

MONTH OF PRODUCTION CUT-OFF DATE: January 2023

INDICATE THE LAST MONTH THAT THE CITY CAN PLACE ORDERS UNDER THIS CONTRACT WITHOUT MISSING THE PRODUCTION CUT OFF DATE: January 2023 .

BID PRICES SHALL REMAIN FIRM FOR ALL ORDERS PLACED PRIOR TO THIS CUT OFF DATE. IN THE EVENT THAT CITY DOES NOT AWARD A CONTRACT PRIOR TO PRODUCTION CUT OFF DATE, CAN BIDDER PROVIDE BID ITEMS, AT THE BID PRICE SUBMITTED, AFTER THE PRODUCTION CUT OFF DATE? (YES/NO) 1 unit only .

ITEM	QUANTITY	DESCRIPTION
2	1	Cooperative Fee

PRICE EACH: $ 2000.00

TOTAL: $ 2000.00

Prompt Payment Discount: 0 % 10 **days. (If no discount is offered, Net 30 days)**

***** Please include HGAC worksheet with your bid submission. *****