



CITY OF SAN ANTONIO
Finance Department - Purchasing Division

REQUEST FOR OFFER (“RFO”) NO.: 6100014567

PIERCE VELOCITY HEAVY RESCUE TRUCK (HGAC)

Date Issued: SEPTEMBER 30, 2021

RESPONSES MUST BE RECEIVED NO LATER THAN:
10:00 AM, CENTRAL TIME, OCTOBER 11, 2021

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: Genaro De Leon, Procurement Specialist II, P.O. Box 839966, San Antonio, TX 78283-3966,
Phone: 210-207-7262, Email: Genaro.DeLeon@sanantonio.gov

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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.

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 point of 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 to provide one heavy rescue fire truck. This truck shall contain a 2021 or newer Pierce Velocity chassis, tilt cab, pump module, and body. The vehicle being solicited shall be a replacement for Unit #8915 - a 2010 Pierce Quantum heavy rescue truck serial #4P1CU01H4AA010846. Offers solicited shall be from HGAC Contract #FS12-19 Fire Service Apparatus contract. Additionally, the City of San Antonio is seeking a Trade-In bid price for Unit #8915.
- 4.2 GENERAL CONDITIONS:** The following general conditions will 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 must be year model 2021 or newer.
- 4.2.2** All components shall be installed new, unused, standard production model, and equipment must be serviced in accordance with the manufacturer's recommended pre-delivery check list, 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 in the U.S. Market or in the local area is in doubt.
- 4.3 WARRANTY:** All items bid must include the maximum standard manufacturer's warranty available, including both parts and labor, for all components and attachments.
- 4.3.1** ONE (1) YEAR MATERIAL AND WORKMANSHIP - A Pierce basic apparatus limited warranty certificate, WA0008, is included.
- 4.3.2** THREE (3) YEAR MATERIAL AND WORKMANSHIP - The Pierce custom chassis limited warranty certificate, WA0284, is included.
- 4.3.3** ENGINE WARRANTY - A Detroit Diesel five (5) year limited engine warranty will be provided. A limited warranty certificate, WA0180, is included.
- 4.3.4** STEERING GEAR WARRANTY - A Sheppard three (3) year limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.
- 4.3.5** FIFTY (50) YEAR STRUCTURAL INTEGRITY - The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included.
- 4.3.6** FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY - The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included.
- 4.3.7** REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY - A Meritor axle limited warranty certificate, WA0046, is included.
- 4.3.8** ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY - A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included.
- 4.3.9** TEN (10) YEAR STRUCTURAL INTEGRITY - The Pierce custom cab limited warranty certificate, WA0012, is included.
- 4.3.10** TEN (10) YEAR PRO-RATED PAINT AND CORROSION - A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included.
- 4.3.11** FIVE (5) YEAR MATERIAL AND WORKMANSHIP - The Pierce Command Zone electronics limited warranty certificate, WA0014, is included.
- 4.3.12** CAMERA SYSTEM WARRANTY - A Pierce fifty-four (54) month warranty will be provided for the camera system.
- 4.3.13** COMPARTMENT LIGHT WARRANTY - The Pierce 12-volt DC LED strip lights limited warranty certificate, WA0203, is included.
- 4.3.14** TRANSMISSION WARRANTY - The transmission will have a five (5) year/unlimited mileage warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission. The transmission cooler is excluded and is not covered under any extended warranty.
- 4.3.15** TRANSMISSION COOLER WARRANTY - The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a 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. A copy of the warranty certificate will be submitted with the bid package.
- 4.3.16** FIFTEEN (15) YEAR STRUCTURAL INTEGRITY - The Pierce heavy duty rescue apparatus body limited warranty certificate, WA0010, is included.

- 4.3.17 ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY** - An AMDOR roll-up door limited warranty will be provided. The roll-up door will be warranted against manufacturing defects for a period of ten (10) years. A five (5) year limited warranty will be provided on painted roll up doors. The limited warranty certificate, WA0185, is included.
- 4.3.18 SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY** - A Harrison Hydra-Gen limited warranty certificate, WA0285, is included.
- 4.3.19 TEN (10) YEAR PRO-RATED PAINT AND CORROSION** - A Pierce body limited pro-rated paint warranty certificate, WA0057, is included.
- 4.3.20 ONE (1) YEAR MATERIAL AND WORKMANSHIP** - The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included.
- 4.3.21** All other 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.
- 4.3.22 DELIVERY:** The apparatus will be delivered under its own power to ensure proper break-in of all components while the apparatus is still under warranty. Delivery will be to a location in San Antonio, Texas, specified by City and identified on Purchase Order. The vendor will be responsible for vehicle(s) until accepted by representative at City of San Antonio Facility in San Antonio, TX. Deliveries will be coordinated with Chief of Fire Department Services or their designee. **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.**
- 4.4 EQUIPMENT MANUALS:** Two operator's manuals will be provided per purchase order, which shall include a paper parts and maintenance manual or two USB drives detailing the equipment, accessories, and components as well as construction drawings complete with wiring diagrams.
- 4.5 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 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.
- 4.6 MINIMUM VEHICLE ACCESSORIES:** All units shall 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. All units shall be equipped with steering column mounted gear selector unless otherwise specified. 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 shall be equipped with OEM tinted glass.
- 4.7 SINGLE SOURCE MANUFACTURER:** The chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the specifications listed herein. The electrical system shall either be hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer.
- 4.8 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.
- 4.9 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.

4.10 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. Acceptance will not be made, nor payment initiated on vehicles failing to meet specifications, 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.

4.11 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 the towing company pursuant to this provision.

4.12 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.

4.13 No dealership nameplates, markings or decals are permitted on the vehicles.

4.14 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.

4.15 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.

4.16 SAFETY VIDEO: At the time of delivery Pierce will also provide one (1) professionally produced apparatus safety video, in DVD format; or access to online instruction offered by Pierce Manufacturing with interactive learning modules. This training shall 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.

4.17 PERFORMANCE TESTS: A road test will be conducted by the vendor and city 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. **VENDOR SHALL PROVIDE ALL CERTIFICATIONS AND PERFORMANCE TESTING CERTIFICATES THAT COME STANDARD WITH THE PIERCE VELOCITY CHASSIS.**

4.18 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 execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".

4.18.1 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.

4.18.2 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.

- 4.19 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 customer 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.
- 4.19.1** 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.
- 4.19.2** 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.
- 4.20 INSPECTION CERTIFICATE:** a third-party inspection certificate for the truck provided will be furnished upon delivery. The certificate shall be from the Underwriters Laboratories Inc. To assure the vehicle is built to current NFPA 1901 standards in its entirety. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the truck.
- 4.21 GENERATOR TEST:** If the unit has a generator, the generator will be tested, approved, and certified by underwriters laboratories at the manufacturer's expense. The test results will be provided to the fire department at the time of delivery.
- 4.22 BREATHING AIR TEST:** Vendor shall ensure if the unit has breathing air, pierce manufacturing 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*.
- 4.23 INSPECTION TRIP(S):** the bidder will provide three (3) factory inspection trip(s) for preconstruction, mid-point, and final inspection for 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, lodging and meals will be the responsibility of the bidder.
- 4.24 PRODUCT CHANGES AND IMPROVEMENTS:** Components and processes shall be as accurate as known at the time of bid submission, but may be subject to change for the purpose of product or process improvements, or changes in industry standards. Providing the change does not affect the meaning or definition of the bid specifications.
- 4.25 AFTERMARKET SUPPORT WEBSITE:** pierceparts.com Vendor will provide City with comprehensive information pertaining to the maintenance and service of City's apparatus through its Pierce authorized dealer access to pierceparts.com. This tool will provide the Pierce authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips.
- Pierceparts.com is also accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized Pierce dealer for additional support and service.
- 4.26 APPROVAL DRAWING:** A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The pierce 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.
- A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the City showing any changes made to the approval drawing.
- 4.27 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 by Vendor.

4.28	ITEM	Quantity	Description
1		1	Pierce Velocity Heavy Rescue Truck

4.28.1 VELOCITY CHASSIS- Chassis provided will be a 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. The apparatus under contract shall be designed and built to match the cab similar to 31672, 32239, and 32241 with the understanding that there shall be some variation necessary due to changes in the current production of this chassis make.

4.28.2 WHEELBASE – Minimum 245.50”

4.28.3 GVW RATING – Minimum 72,000 lbs.

4.28.4 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.

4.28.5 FRAME REINFORCEMENT - In addition, a full-length mainframe internal "C" liner will be provided. The liner will be an internal "C" design that steps to a smaller internal "C" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x .25" through the front "C" portion of the liner, stepping to 9.38" x 3.00" x .25" through the rear "C" portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb.

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

4.28.6 FRONT NON DRIVE AXLE - The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 24,000 lb.

4.28.6.1 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.

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

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

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

4.28.6.5 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.

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

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

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

- 4.28.6.9** The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.
- 4.28.6.10** The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.
- 4.28.6.11** 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.
- 4.28.7 FRONT SUSPENSION** - Front Oshkosh TAK-4™, or equivalent brand, independent suspension will be provided with a minimum ground rating of 22,800 lb.
- 4.28.7.1** 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.
- 4.28.7.2** 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.
- 4.28.7.3** 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.
- 4.28.7.4** 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.
- 4.28.7.5** The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.
- 4.28.8 FRONT SHOCK ABSORBERS** – KONI, or equivalent brand, heavy-duty telescoping shock absorbers, or equivalent brand will be provided on the front suspension.
- 4.28.9 FRONT OIL SEALS** - Oil seals with viewing window will be provided on the front axle.
- 4.28.10 FRONT TIRES** - front tires will be Michelin, or equivalent brand, 425/65R22.50 radials, 20 ply XFE wide base tread, rated for 24,400 lb maximum axle load and 65 mph maximum speed. The tires will be mounted on 22.50" x 12.25" steel disc type wheels with a ten (10)-stud, 11.25" bolt circle.
- 4.28.11 REAR AXLE** - The rear axle will be a Meritor™, Model RT-46-160, tandem axle assembly with a capacity of 48,000 lb. An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.
- 4.28.12 TOP SPEED OF VEHICLE** - A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 60 mph.
- 4.28.13 REAR SUSPENSION** - Rear suspension will be Raydan® Air Link™ combination air ride, or equivalent brand, and walking beam with a ground rating of 40,000 pounds.
- 4.28.14 REAR OIL SEALS**- Oil seals will be provided on the rear axle(s).
- 4.28.15 REAR TIRES** - Rear tires will be eight (8) Michelin, or equivalent brand, 12R22.50 radials, 16 ply all position XZE* tread, rated for 54,240 lb maximum axle load and 75 mph maximum speed. The tires will be mounted on Accuride®, or equivalent brand, 22.50" x 8.25" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.
- 4.28.16 TIRE BALANCE** - All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

- 4.28.17 TIRE PRESSURE MANAGEMENT** - There will be a RealWheels LED AirSecure™ tire alert pressure management system, or equivalent, shall be provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of 10 tires.
- 4.28.17.1** The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.
- 4.28.17.2** Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.
- 4.28.18 FRONT HUB COVERS** - Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.
- 4.28.19 REAR HUB COVERS** - Stainless steel, high hat, hub covers will be provided on the rear axle hubs.
- 4.28.20 CHROME LUG NUT COVERS** - Chrome lug nut covers will be supplied on front and rear wheels.
- 4.28.21 MUD FLAPS** - Mud flaps with a Pierce logo will be installed behind the front and rear wheels.
- 4.28.22 WHEEL CHOCKS** - There will be one (1) pair of Ziamatic AC-32, aluminum alloy, Quick-Choc wheel blocks provided.
- 4.28.23 WHEEL CHOCK BRACKETS** - There will be one (1) pair of Ziamatic QCH-32-H horizontal mounting wheel chock brackets provided for the Ziamatic AC-32 wheel chocks. The brackets will be mounted under driver side front compartments using nylon locking nuts to install the brackets.
- 4.28.24 ELECTRONIC STABILITY CONTROL** - A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.
- 4.28.24.1** 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.
- 4.28.24.2** 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.
- 4.28.25 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.
- 4.28.26 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.

4.28.27 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™ Disc Plus, EX225 disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

4.28.28 AIR COMPRESSOR, BRAKE SYSTEM - 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 in the rear seat riser on the right side. The compressor will maintain the air pressure in the chassis air brake system while the vehicle is not in use. A pressure switch will sense when the system pressure drops and automatically start the compressor, which then will run until pressure is restored.

4.28.29 BRAKE SYSTEM - The brake system will include:

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

4.28.29.2 Heated automatic moisture ejector on air dryer.

4.28.29.3 Total air system capacity of 6,653 cubic inches.

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

4.28.29.5 Spring set parking brake system.

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

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

4.28.29.8 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.

4.28.29.9 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.

4.28.29.10 1/4 turn drain valves on each air tank.

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

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

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

4.28.31 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.

4.28.32 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.

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

4.28.32.2 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.

4.28.33 RECESSED BOX FOR AIR FITTING - One (1) air inlet will have a smooth aluminum recessed box provided. The box(es) will allow the air fitting to be recessed inside the stepwell to prevent damage and located on the driver side.

4.28.34 AIR TANK, SPECIAL LOCATION - Due to space constraints, there should not be an air tank located under the def pump/filter., One air tank shall be mounted on the outboard of the frame rail.

4.28.35 U-BOLT GUARD OVER PARKING BRAKE KNOB - There will be one (1) U-bolt type protective guard(s) installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guard will be located on the driver's side.

4.28.36 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.

- 4.28.37 ENGINE** - The chassis will be powered by Detroit, model DD13 diesel, 6-cylinder, displacement 12.8L engine. That is capable of 525 HP at 1625 RPM with torque at 1850 lb-ft at 1075 RPM. Truck shall have a speed governed at 1900 RPM Road and 2080 RPM at parked PTO. Engine shall be a dual cartridge style with check valve, water separator, and water in fuel sensor, with a Delco Remy 39MT 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.
- 4.28.38 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.
- 4.28.38.1** The high idle will be operational only when the parking brake is on, the truck transmission is in neutral, and the engine has been idling for 5 minutes. 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".
- 4.28.38.2** The high idle circuit will be programmed to allow high idle with the parking brake applied, transmission in neutral and pump in gear.
- 4.28.38.3** When the truck transmission is shifted into gear with the high idle on, the high idle will drop out for a safe shift condition.
- 4.28.39 ENGINE BRAKE** - A Jacobs engine brake must be installed with the controls located on the instrument panel within easy reach of the driver.
- 4.28.39.1** The driver will be able to turn the engine brake system on/off and have high, medium and low setting.
- 4.28.39.2** The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.
- 4.28.39.3** The ABS system will automatically disengage the auxiliary braking device, when required.
- 4.28.40 CLUTCH FAN** - A Horton® 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.
- 4.28.41 ROCKER COVER BOLTS** - The rear most bolts on the engine rocker cover will be flat head style. This is in place of the "stud" style provided as standard.
- 4.28.42 HEAVY DUTY OIL LINE** - A heavy duty oil line and fittings will be provided between the engine oil pan and the oil level manifold.
- 4.28.43 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.
- 4.28.44 EXHAUST SYSTEM** - The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter.
- 4.28.44.1** An insulation wrap will be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab.
- 4.28.44.2** The exhaust will terminate horizontally ahead of the right-side rear wheels, flush with the body rubrail. Tailpipe will be angled 35 degrees to the rear. 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.

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

4.28.45.1 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.

4.28.45.2 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.

4.28.45.3 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.

4.28.45.4 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.

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

4.28.46.1 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.

4.28.46.2 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.

4.28.47 INSULATION WRAP - The lower radiator hose will be wrapped with orange heat resistant insulation to prevent damage to electrical harness.

4.28.48 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.

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

4.28.48.2 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."

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

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

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

4.28.49 DIESEL EXHAUST FLUID TANK - A 4.5-gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

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

4.28.49.2 A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the engine fuel inlet behind a door, painted door on the left side of the vehicle. There will be a South Co. C2 non locking latch provided.

4.28.49.3 The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

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

4.28.50 FUEL FILL DOOR – Fuel fill door will be painted job color.

4.28.51 FUEL COOLER - An air to fuel cooler will be installed in the engine fuel return line. The fuel filler cap will have a retaining chain and holder provided on the fuel fill door.

4.28.52 TRANSMISSION -An Allison 5th generation, Model EVS 4500PR, 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.

4.28.52.1 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).

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

4.28.52.3 The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

4.28.52.4 The transmission will have the 1600 ft. lb. torque (medium) spring setting for retardation force.

4.28.52.5 The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

4.28.52.6 The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

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

4.28.53 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.

4.28.53.1 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.

4.28.54 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.

4.28.55 DOWNSHIFT MODE (w/engine brake) - The transmission will be provided with an aggressive downshift mode. This will provide earlier transmission downshifts to 2nd gear from 6th gear, resulting in improved engine braking performance.

4.28.56 DRIVELINE - Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints. The shafts will be dynamically balanced before installation. A splined slip joint will be provided in each driveshaft. The slip joint will be coated with Glidecoat® or equivalent.

4.28.57 UNIVERSAL JOINT GREASE SHIELD – Each universal joint and slip joint in the driveline requires a grease shield to prevent grease from being thrown against the frame wiring harness.

4.28.58 PAINT TRANSMISSION OUTPUT YOKE - The pump transmission output yoke will be brush painted job color.

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

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

4.28.61 LOGO AND CUSTOMER DESIGNATION ON DASH - The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer'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.

4.28.61.1 The first row of text will be: San Antonio

4.28.61.2 The second row of text will be: Fire

4.28.61.3 The third row of text will be: Department

4.28.62 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."

4.28.63 WINCH - A Warn, multi-mount, 9,000 lb portable 12V electric winch will be provided. The winch will mount to the vehicle receiver hitch and be held in place with a locking hardened pin. The winch will be provided with 125 feet of .313" galvanized cable with a replaceable clevis hook. A minimum of a 30' remote control will be provided. A label will be placed on or near the receiver that states the maximum winch load rating and the maximum rope load rating that the receiver can support.

4.28.64 FRONT WINCH - A Warn Series 15, 15,000 pound electric winch will nest below the top aluminum treadplate surface of the front bumper. A 28.00" x 10.00" door for maintenance and access to the winch direction control lever and remote control plug will be provided. The cover will be provided with a pneumatic stay arm on each side hold-open device. Winch will be mounted on a surface that will not flex when the winch is in use, since it could bind working parts of the winch. Winch will be braced by a three (3) point mount, as recommended by the winch manufacturer. The winch will include 90 feet of .437" galvanneal wire rope, with hook prespooled on the drum. Winch will have planetary gearing. Electric motor will have a thermal overload protection switch.

4.28.64.1 Wire cables to battery will be two (2)-gauge or larger. Speed and amperage draw of winch will be variable depending on winch load.

4.28.64.2 Winch will have a minimum of a 30' remote control cable.

4.28.64.3 A chrome four (4)-way roller fairlead will be supplied of sufficient strength to accommodate the winch capacity.

4.28.64.4 A label will be placed on or near the mount that states the maximum winch load rating and the maximum rope load rating that the mount can support.

4.28.64.5 The .437" wire rope does not meet the NFPA 2x factor of safety therefore, NFPA guidelines will be waived by the fire department to use .437"x 90 wire rope giving a factor of safety of 1.5.

4.28.65 BUMPER - A one (1) piece bumper manufactured from 0.25" formed steel with a 0.38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 19.00" from the face of the cab. The bumper will be 102.00" wide with 45-degree corners and side plates. The bumper will be metal finished and painted job color. To provide adequate support strength, the bumper will be mounted directly to the front of the C channel frame. The frame will be a bolted modular extension frame constructed of 50,000 psi tensile steel.

- 4.28.66 GRAVEL PAN** - A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and the cab face. The pan will be properly supported from the underside to prevent flexing and vibration. Documentation will be provided, upon request, to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to, the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge and suction connections.
- 4.28.67 TOOL BOX** - The front bumper extension will have an aluminum tool box installed on the left side. The box will be raised 1.50" above the gravel pan.
- 4.28.68 TOOL BOX COVER** - A bright aluminum treadplate cover will be provided. The cover will be attached with a stainless steel hinge. A single butterfly latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.
- 4.28.69 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.
- 4.28.70 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 job color.
- 4.28.71 TOW HOOKS** - No tow hooks must be provided. This truck will be equipped with a lift and tow package with integral tow eyes.
- 4.28.72 LICENSE PLATE (MOUNTING HOLES)** - Four (4) mounting holes will be provided in the center of the front bumper for the customer to mount a license plate.
- 4.28.73 FRONT BUMPER PROTECTIVE COATING** - Protective black Pierce polyurea texture coating will be provided on the outside exterior of the top front bumper flange. It will not be applied on the underside of the flange.

4.28.74 CAB - The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

- 4.28.74.1** To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.
- 4.28.74.2** For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy-duty design, constructed to the following minimal standards.
- 4.28.74.3** 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.
- 4.28.74.4** 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.
- 4.28.74.5** 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.
- 4.28.74.6** 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.
- 4.28.74.7** The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.
- 4.28.74.8** 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 20.00" raised roof, with an overall cab height of approximately 122.00". 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.
- 4.28.74.9** 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.
- 4.28.74.10** To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab of will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 72.95" in the center position and 78.75" in the outboard positions.
- 4.28.74.11** The crew cab will measure a minimum of 71.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

4.28.75 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.

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

4.28.77 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.

- 4.28.78 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.
- 4.28.79 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 Pierce 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).
- 4.28.80 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. The back of the engine tunnel will be no higher than 16.25" off the crew cab floor. The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel 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.
- 4.28.81 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.
- 4.28.82 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.
- 4.28.83** 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).
- 4.28.83.1** 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.
- 4.28.83.2** 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.
- 4.28.83.3** 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.
- 4.28.84 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.
- 4.28.85 SPIRAL LOOM** - Spiral loom, 1.00" in diameter, will be provided on the hydraulic cab lift lines that run on each side of the cab. The loom will be supplied on each line starting at the cab lock release to the point at which the lines enter the frame rails.
- 4.28.86 CAB LIFT STAY ARM** - DuraSurf™ on the cab lift stay arm will be held in place with #10 flush mount screws.
- 4.28.87 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.

- 4.28.88 SCUFFPLATE** - A bright aluminum treadplate scuff plate will be provided on the entire rear vertical surface of the engine tunnel.
- 4.28.89 SCUFFPLATE** - A treadplate scuff plate will be installed on the top edge of both rear facing seat risers. The scuff plate will be flanged to the front to protect the painted edge of the seat riser.
- 4.28.90 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.
- 4.28.91 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. The flat glass in each mirror will be heated and adjustable with remote controls that are convenient to the driver. The convex section in each mirror will be heated and adjustable with remote controls.
- 4.28.92 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.
- 4.28.93 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. Mirror head will be K-10, EB50S-S, 8.00" stainless steel housing with three (3) arms. A 6.00" riser will be provided between the mirror body and support arm on the right side only.
- 4.28.94 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.
- 4.28.94.1** 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.
- 4.28.94.2** The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.
- 4.28.94.3** 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.
- 4.28.94.4** The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. 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.
- 4.28.94.5** 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.
- 4.28.94.6** A chrome grab handle will be provided on the inside of each cab and crew cab door.
- 4.28.94.7** 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.
- 4.28.95 CAB DOOR PANELS** - The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

- 4.28.96 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.
- 4.28.97 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.
- 4.28.98 ELECTRIC CAB DOOR LOCKS** - The front driver, officer and crew cab doors will have a door lock master switch. The switches will control all cab door locks. Each door will have a keyed exterior lock mechanism built into the door handle assembly.
- 4.28.98.1** 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.
- 4.28.98.2** 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.
- 4.28.99 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 9.00" 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". The first step will be lit by a white 12-volt DC LED light provided on the step.
- 4.28.100 CAB EXTERIOR HANDRAILS** - A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.
- 4.28.101 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. 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. The lights will be activated when the adjacent door is opened.
- 4.28.102 FENDER CROWNS** - Rubber fender crowns will be provided around the cab wheel openings. Crowns will be black.
- 4.28.103 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.
- 4.28.104 WINDOWS INTERIOR TRIM** - For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.
- 4.28.105 UPPER REAR WINDOWS ON SIDES OF CREW CAB** - Two (2) windows will be provided above the crew cab door, along the sides of the raised roof section of the cab, one (1) on each side of the cab. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive. The visibility through each window will measure 35.25" wide x 7.12" high. The windows will be tinted a privacy, dark gray automotive tint.

- 4.28.106 STORAGE COMPARTMENTS** - Provided at the forward facing left and right-side crew cab positions behind the crew cab door will be a full height compartment with internal and external access. The compartments will be open from top to bottom with no dividers:
- 4.28.106.1** The upper section will be 21.50" wide x 78.75" high x 27.00" deep. The lower section will be 21.50" wide x 15.50" high x 26.25" deep (left side) and 24.00" deep (right side).
 - 4.28.106.2** The top of the compartments will be notched around the wire raceways and extend to the ceiling.
 - 4.28.106.3** The compartments will be sealed off from the inside of the cab.
 - 4.28.106.4** There will be interior access provided with two (2) Amdor rollup doors with anodized finish, non-locking, one (1) for each compartment. The interior clear door opening for each compartment will be approximately 15.50" wide x 62.12" high.
 - 4.28.106.5** There will be exterior access provided with two (2) Amdor rollup doors painted to match the primary color of the cab exterior, non-locking, one (1) on each side of the cab. The exterior clear door opening for each compartment will be approximately 19.25" wide x 70.00" high.
 - 4.28.106.6** The compartment interior will be painted spatter gray.
- 4.28.107 COMPARTMENT LIGHT** - There will be four (4) white LED strip lights, one (1) each side of exterior compartment door opening. The lights will be controlled by an automatic door switch.
- 4.28.108 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.
- 4.28.109 CAB DOORS** - All cab doors to open 90 degrees.
- 4.28.110 CAB ROOF DRIP RAIL** - For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be constructed of bright polished extruded aluminum, and be bonded to the sides of the cab. The drip rail will extend the full length of the cab roof. The drip rails will also be located under the light brackets welded on the cab roof.
- 4.28.111 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. An additional reinforcement support will be provided on the right side of the plate at the center bend. 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.
- 4.28.112 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.
- 4.28.112.1** 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.
 - 4.28.112.2** 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.
 - 4.28.112.3** To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.
 - 4.28.112.4** 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.

- 4.28.112.5** 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.
- 4.28.112.6** 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.
- 4.28.112.7** 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.
- 4.28.113 CAB INTERIOR UPHOLSTERY** - The cab interior upholstery will be dark silver gray. All cab interior materials will meet FMVSS 302 (flammability of interior materials).
- 4.28.114 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.
- 4.28.115 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.
- 4.28.116 CAB DEFROSTER** - To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable metal cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. 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.
- 4.28.116.1** The panels for the crew cab heaters under the rear facing crew cab seats will be provided with louvers in the top portion in front of the heater core to protect it from damage. The lower portion of the panel will remain standard with cut-outs to allow for proper ventilation.
- 4.28.116.2** The performance rating is no longer valid as the air intake has been reduced with the incorporation of louvers to replace the knock outs.
- 4.28.116.3** The heater/defroster and crew cab heaters will be controlled by an integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear independently. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature.
- 4.28.117 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.
- 4.28.117.1** 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.
- 4.28.117.2** A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs shall be painted white as provided by the A/C manufacturer.

- 4.28.117.3** The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.
- 4.28.117.4** The evaporator unit will have a 49,000 BTU (4.08 tons) rating that meets and exceeds the performance specifications.
- 4.28.117.5** There will be a hinge on the forward edge of the filter cover and two (2) quarter turn fasteners with a knob on the rear edge to allow easy access. The filters will be HEPA style filters.
- 4.28.117.6** Adjustable air outlets will be strategically located on the evaporator cover per the following:
- 4.28.117.6.1** Four (4) will be directed towards the driver's location
 - 4.28.117.6.2** Four (4) will be directed towards the officer's location
 - 4.28.117.6.3** Eight (8) will be directed towards crew cab area
- 4.28.117.7** The air conditioner refrigerant will be R-134A and will be installed by a certified technician.
- 4.28.117.8** The air conditioner will be controlled by dual zone integral electronic control panels for the heater, defroster and air conditioner. The cab control panel will be located in the center console. For ease of operation, the control panels will include variable adjustment for temperature and fan control.
- 4.28.118 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.
- 4.28.118.1** 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.
- 4.28.119 FOAM GASKET BEHIND HEATER GRILLE** - A foam gasket will be provided around the edges of the heater grilles in the left and right-side rear facing seat risers.
- 4.28.120 SPECIAL 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.
- 4.28.121 AIR CONDITIONING WARRANTY** - The manufacturer will warrant the air conditioning compressor shall be free of defects in material and workmanship for a period of three (3) years. All conditions of our standard chassis warranty (included with bid) will apply except the warranty period on the air conditioning compressor will be for three (3) years. The warranty covers material and labor for the air conditioning system compressor.
- 4.28.122 SUN VISORS** - Two (2) smoked 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 no retention bracket provided to help secure each sun visor in the stowed position.
- 4.28.123 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.
- 4.28.124 ENGINE COMPARTMENT LIGHTS** - There will be one (1) Whelen®, Model 3SC0CD CR, 12 volt DC, 3.00" white LED light(s) with Model 3FLANG EC, chrome flange kit(s) installed under the cab shall be used as engine compartment illumination. These light(s) will be activated automatically when the cab is raised or when the dip stick door is opened.

4.28.125 ACCESS TO ENGINE DIPSTICKS - For access to the engine oil and transmission fluid dipsticks, there will be an access panel on the engine tunnel, inside the crew cab. The access panel will be on the rear wall of the engine tunnel, on the vertical surface. The panel will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel. The panel will have a rubber seal for thermal and acoustic insulation. Two (2) flush latch will be provided on the access panel.

4.28.125.1 Service access will be impeded when seats or EMS cabinets are mounted in the center rear facing position of the crew cab and may require the cab be tilted to access the dipstick and fill tubes.

4.28.125.2 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.

4.28.126 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. The map box will be constructed of .125" aluminum and will be painted to match the cab interior. There will be a quantity of three (3). The map box will be mounted on forward wall of center EMS cabinet between driver and officer above engine tunnel. Locate the top of the map box 3" down from the top of the cabinet, centered L/R.

4.28.127 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:

4.28.127.1 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.

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

4.28.127.3 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.

4.28.127.4 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.

4.28.127.5 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.

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

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

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

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

4.28.128.1 Driver side front air bag.

4.28.128.2 Passenger side knee bolster air bag.

4.28.128.3 Air curtains mounted in the outboard bolster of outboard seat backs.

4.28.128.4 Suspension seats will be retracted to the lowest travel position.

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

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

- 4.28.129.1** Air curtains mounted in the outboard bolster of outboard seat backs.
- 4.28.129.2** Suspension seats will be retracted to the lowest travel position.
- 4.28.129.3** Seat belts will be pre-tensioned to firmly hold the occupant in place.

4.28.130 SEATING CAPACITY - The seating capacity in the cab will be six (6).

4.28.131 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 (1.75" travel) and horizontal (7.00" 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). The seat will include the following features incorporated into the side roll protection system:

- 4.28.131.1** 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.
- 4.28.131.2** 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.
- 4.28.131.3** 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.

4.28.132 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:

- 4.28.132.1** 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.
- 4.28.132.2** A suspension seat safety system will be included. When activated this system will pretension the seat belt and retract the seat to its lowest travel position.
- 4.28.132.3** 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.

4.28.133 REAR FACING DRIVER SIDE OUTBOARD SEAT - There will be one (1) rear facing, Pierce PS6® seat provided at the driver 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:

- 4.28.133.1** 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.
- 4.28.133.2** 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.
- 4.28.133.3** 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.
- 4.28.134 REAR FACING CENTER SEATS** - There will be two (2) rear facing, Pierce PS6® seats provided at the center position in the crew cab. The seat backs 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 seats will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats 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 seats will include the following feature incorporated into the side roll protection system:
- 4.28.134.1** A seat safety system will be included. When activated, this system will pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.
- 4.28.134.2** The seats will be furnished with a lap type seat belt. The seat belts will be furnished with automatic retractors.
- 4.28.135 REAR FACING PASSENGER SIDE OUTBOARD SEAT** - There will be one (1) rear facing, Pierce PS6® seat provided at the passenger 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:
- 4.28.135.1** 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.
- 4.28.135.2** 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.
- 4.28.135.3** 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.
- 4.28.136 FORWARD FACING CENTER CABINET** - A forward facing cabinet will be provided in the crew cab at the center position. The cabinet will be 42.00" wide x 58.00" high x 24.00" deep with one (1) Amdor rollup door with white finish, locking with #1250 key. The cabinet will be provided with no false floor. The frame to frame opening of the cabinet will be 39.50" wide x 52.75" high. The minimum clear door opening will be 36.75" wide x 46.87" high. The cabinet will include three (3) infinitely adjustable shelves with a 1.25" up-turned lip painted to match the cab interior. The cabinet will include no louvers. The cabinet will be constructed of smooth aluminum and painted to match the cab interior.
- 4.28.137 FORWARD FACING CABINET LIGHT** - There will be one (1) white LED strip light installed on the left side of the interior cabinet door opening and one (1) white LED strip light installed on the right side of the interior cabinet door opening. The lighting will be controlled by an automatic door switch.
- 4.28.138 FOWARD FACING OVERHEAD STORAGE CABINET** - There will be an overhead storage cabinet installed above the forward facing crew cab center seats. The cabinet will be 51.50" wide x 20.00" high x 14.00" deep. The cabinet will include one (1) lift up cabinet doors. Non-locking latch and gas operated stay arms will be provided on each door. The cabinet will be provided with a divider between each door opening. Covers will be incorporated in the interior of the cabinet to provide access to the wire raceways. The cabinet will be constructed of smooth aluminum and painted to match the cab interior.
- 4.28.139 FOWARD FACING OVERHEAD STORAGE CABINET LIGHT** - There will be one (1) white LED strip light installed horizontally above each compartment door opening. The lights will be controlled by an automatic door switch.

- 4.28.140 GUARD** - There will be one (1) stainless steel guard, designed to protect the roll-up door from damage when in the retracted position, provided on each EMS compartment located both sides, both doors and the center forward facing. There will be a total of five (5) guard(s) provided.
- 4.28.141 SHELVING** - There will be eight (8) shelves provided in the EMS compartment. Each shelf will be constructed of .090" aluminum with a 0.75" lip flanged down. Shelving will be infinitely adjustable by means of a threaded tightener sliding in a track. The location will be 3 each side, and 2 in the center.
- 4.28.142 REAR FACING OVERHEAD STORAGE COMPARTMENT** - There will be two (2) overhead rear facing storage compartments installed at the raised roof within the crew cab, on each side of the air conditioner. The compartments will be approximately 22.00" wide x 20.00" high x 34.00" deep at the bottom.
- 4.28.142.1** Each compartment will include one (1) lift up compartment door. Locking latch, paddle handle, and gas operated stay arms will be provided.
- 4.28.142.2** The compartment will be constructed of smooth aluminum and painted to match the cab interior.
- 4.28.143 COMPARTMENT LIGHT** - The storage compartment lighting will consist of one (1) white LED strip light installed horizontally above each compartment door opening.
- 4.28.144 SEAT UPHOLSTERY** - All seat upholstery will be gray Turnout Tuff material.
- 4.28.145 AIR BOTTLE HOLDERS** - All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G. There will be a quantity of five (5) SCBA brackets.
- 4.28.146 SEAT BELTS** - All seating positions in the cab, crew cab and tiller cab (if applicable) 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. 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.
- 4.28.147 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. A total of six (6) seating positions will have the adjustable shoulder harness.
- 4.28.148 HELMET STORAGE** - Helmet storage will be located in a fully enclosed and latched cab compartment.
- 4.28.149 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. The color of the LED's will be red and white. The white LED's will be controlled by the lens switch. The color LED's will be controlled by the door switches and the lens switch.
- 4.28.150 ADDITIONAL DOME LIGHTS** - There will be two (2) 6.00" round Whelen, Model 60CREGCS white and red LED dome light installed in the cab located center.
- 4.28.150.1** The red light will be controlled by the door switch and a switch on the light.
- 4.28.150.2** The white light will be controlled by the switch on the light.

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

- 4.28.151.1** One (1) overhead in front of the driving position.
- 4.28.151.2** One (1) overhead in front of the passenger's position.
- 4.28.151.3** Each light will include a switch on the light housing.
- 4.28.151.4** The light switches will be energized when the spare wire cut off switch is on.

4.28.152 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 and two in the rear crew cab area on the wire cover at the ceiling, match 29756 and 29674.

4.28.153 POWER TO HAND HELD SPOTLIGHT - The 12-volt DC power to recharge the hand lights will be from the spare wire fuse panel located Front lights mount on the angled section toward the rear door frame each side DS and PS front. Rear lights hanging from the ceiling.

4.28.154 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.

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

- 4.28.155.1** - Voltmeter gauge (Volts)
- 4.28.155.2** Low volts (11.8 VDC)
- 4.28.155.3** Amber indicator on gauge assembly with alarm
- 4.28.155.4** High volts (15 VDC)
- 4.28.155.5** Amber indicator on gauge assembly with alarm
- 4.28.155.6** Very low volts (11.3 VDC)
- 4.28.155.7** Amber indicator on gauge assembly with alarm
- 4.28.155.8** Very high volts (16 VDC)
- 4.28.155.9** Amber indicator on gauge assembly with alarm
- 4.28.155.10** - Tachometer (RPM)
- 4.28.155.11** - Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- 4.28.155.12** - Fuel level gauge (Empty - Full in fractions)
- 4.28.155.13** Low fuel (1/8 full)
- 4.28.155.14** Amber indicator on gauge assembly with alarm
- 4.28.155.15** Very low fuel (1/32) fuel
- 4.28.155.16** Amber indicator on gauge assembly with alarm
- 4.28.155.17** - Engine oil pressure gauge (PSI)
- 4.28.155.18** Low oil pressure to activate engine warning lights and alarms
- 4.28.155.19** Red indicator on gauge assembly with alarm
- 4.28.155.20** - Front air pressure gauge (PSI)
- 4.28.155.21** Low air pressure to activate warning lights and alarm
- 4.28.155.22** Red indicator on gauge assembly with alarm
- 4.28.155.23** - Rear air pressure gauge (PSI)
- 4.28.155.24** Low air pressure to activate warning lights and alarm
- 4.28.155.25** Red indicator on gauge assembly with alarm
- 4.28.155.26** - Transmission oil temperature gauge (Fahrenheit)
- 4.28.155.27** High transmission oil temperature activates warning lights and alarm
- 4.28.155.28** Amber indicator on gauge assembly with alarm
- 4.28.155.29** - Engine coolant temperature gauge (Fahrenheit)
- 4.28.155.30** High engine temperature activates an engine warning light and alarm
- 4.28.155.31** Red indicator on gauge assembly with alarm
- 4.28.155.32** - Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

- 4.28.155.33 Low fluid (1/8 full)
- 4.28.155.34 Amber indicator on gauge assembly with alarm
- 4.28.155.35 All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

4.28.156 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.

- 4.28.156.1 The following amber telltale lamps will be present:
- 4.28.156.2 Low coolant
- 4.28.156.3 Trac cntl (traction control) (where applicable)
- 4.28.156.4 Check engine
- 4.28.156.5 Check trans (check transmission)
- 4.28.156.6 Aux brake overheat (Auxiliary brake overheat)
- 4.28.156.7 Air rest (air restriction)
- 4.28.156.8 Caution (triangle symbol)
- 4.28.156.9 Water in fuel
- 4.28.156.10 DPF (engine diesel particulate filter regeneration)
- 4.28.156.11 Trailer ABS (where applicable)
- 4.28.156.12 Wait to start (where applicable)
- 4.28.156.13 HET (engine high exhaust temperature) (where applicable)
- 4.28.156.14 ABS (antilock brake system)
- 4.28.156.15 MIL (engine emissions system malfunction indicator lamp) (where applicable)
- 4.28.156.16 SRS (supplemental restraint system) fault (where applicable)
- 4.28.156.17 DEF (low diesel exhaust fluid level)
- 4.28.156.18 The following red telltale lamps will be present: Warning (stop sign symbol), seat belt, Parking brake, Stop engine, and Rack down.
- 4.28.156.19 The following green telltale lamps will be provided: Left turn, Right turn, and Battery On.
- 4.28.156.20 The following blue telltale lamp will be provided: High beam

4.28.157 ALARMS –

- 4.28.157.1 Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.
- 4.28.157.2 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.
- 4.28.157.3 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.

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

4.28.159 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.

- 4.28.159.1 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.

- 4.28.159.2 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.
- 4.28.159.3 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.
- 4.28.159.4 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.
- 4.28.159.5 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.
- 4.28.159.6 "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.
- 4.28.159.7 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.
- 4.28.159.8 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.
- 4.28.159.9 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.
- 4.28.159.10 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.
- 4.28.159.11 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.
- 4.28.159.12 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.
- 4.28.159.13 Parking brake control: An air actuated push/pull park brake control valve will be provided.
- 4.28.159.14 Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

4.28.160 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.

4.28.161 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.

- 4.28.161.1 The diagnostic panel will include the following:
- 4.28.161.2 Engine diagnostic port
- 4.28.161.3 Transmission diagnostic port

- 4.28.161.4 ABS diagnostic port
- 4.28.161.5 SRS diagnostic port (where applicable)
- 4.28.161.6 Command Zone USB diagnostic port
- 4.28.161.7 ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- 4.28.161.8 Diesel particulate filter regeneration switch (where applicable)
- 4.28.161.9 Diesel particulate filter regeneration inhibit switch (where applicable)

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

- 4.28.162.1 Odometer
- 4.28.162.2 Trip mileage
- 4.28.162.3 PTO hours
- 4.28.162.4 Fuel consumption
- 4.28.162.5 Engine hours
- 4.28.162.6 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.

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

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

4.28.165 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). The following messages will be displayed (where applicable):

- 4.28.165.1 Do Not Move Truck
- 4.28.165.2 DS Cab Door Open (Driver Side Cab Door Open)
- 4.28.165.3 PS Cab Door Open (Passenger's Side Cab Door Open)
- 4.28.165.4 DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- 4.28.165.5 PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- 4.28.165.6 DS Body Door Open (Driver Side Body Door Open)
- 4.28.165.7 PS Body Door Open (Passenger's Side Body Door Open)
- 4.28.165.8 Rear Body Door Open
- 4.28.165.9 DS Ladder Rack Down (Driver Side Ladder Rack Down)
- 4.28.165.10 PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- 4.28.165.11 Deck Gun Not Stowed
- 4.28.165.12 Lt Tower Not Stowed (Light Tower Not Stowed)
- 4.28.165.13 Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- 4.28.165.14 Aerial Not Stowed (Aerial Device Not Stowed)
- 4.28.165.15 Stabilizer Not Stowed
- 4.28.165.16 Steps Not Stowed
- 4.28.165.17 Handrail Not Stowed
- 4.28.165.18 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.

4.28.166 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 appliques. 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.

4.28.166.1 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.

4.28.166.2 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.

4.28.167 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.

4.28.168 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:

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

4.28.168.2 The negative wire will be connected to ground.

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

4.28.168.4 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.

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

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

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

4.28.169 SPARE CIRCUIT - There will be one (1) dual USB fast charge socket mounts installed on the apparatus. The above wires will have the following features:

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

4.28.169.2 The negative wire will be connected to ground.

4.28.169.3 Wires will be protected to 4.8 amps at 12 volts DC.

4.28.169.4 The USB socket mount will be location 9.

4.28.169.5 Termination will be a Blue Sea Systems part number 1045 dual USB charger socket.

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

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

4.28.170 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:

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

4.28.170.2 The negative wire will be connected to ground.

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

4.28.170.4 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 shall be mounted PS rear shelf track. All must be wired to the in/out service switch thru the blue sea junction box.

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

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

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

4.28.171 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 blue sea junction boxes in the PS rear facing upper cabinet. The label and switch will be installed in the panel below the dash where the back up camera speaker would fit., match 30782.

4.28.172 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:

- 4.28.172.1** The positive wire will be connected to the auxiliary switch located on the instrument panel to the right of the steering wheel, option 614250.
- 4.28.172.2** The negative wire will be connected to ground.
- 4.28.172.3** Wires will be protected to 60 amps at 12 volts DC.
- 4.28.172.4** Power and ground will terminate in the passenger side radio compartment in the crew cab, all flashlights, power points, radios and charger, rocket modem shall be connected to these terminal strips.
- 4.28.172.5** 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.
- 4.28.172.6** Wires to the fuse block will be sized to 125% of the protection.
- 4.28.172.7** This circuit(s) may be load managed when the parking brake is applied.

4.28.173 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:

- 4.28.173.1** The positive wire will be connected directly to the battery power
- 4.28.173.2** The negative wire will be connected to ground
- 4.28.173.3** Wires will be protected to 15 amps at 12 volts DC
- 4.28.173.4** Power and ground will terminate switch panel #9. All must be wired to the in/out service switch thru the blue sea junction box
- 4.28.173.5** Termination will be with 15 amp, power point plug with rubber cover
- 4.28.173.6** Wires will be sized to 125 percent of the protection
- 4.28.173.7** The circuit(s) may be load managed when the parking brake is set.

4.28.174 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:

- 4.28.174.1** The positive wire will be connected directly to the battery power.
- 4.28.174.2** The negative wire will be connected to ground.
- 4.28.174.3** Wires will be protected to 15 amps at 12 volts DC.
- 4.28.174.4** Power and ground will terminate in the overhead switch panel centered above officer, wiring shall be connected to the in service / out of service switch.
- 4.28.174.5** Termination will be with heat shrinkable butt splicing.
- 4.28.174.6** Wires will be sized to 125 percent of the protection.
- 4.28.174.7** This circuit(s) may be load managed when the parking brake is set.

4.28.175 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:

- 4.28.175.1** The positive wire will be connected directly to the battery power.
- 4.28.175.2** The negative wire will be connected to ground.
- 4.28.175.3** Wires will be protected to 40 amps at 12 volts DC.
- 4.28.175.4** Power and ground will terminate PS radio box.
- 4.28.175.5** Termination will be with 3/8" studs and plastic covers.
- 4.28.175.6** Wires will be sized to 125% of the protection.
- 4.28.175.7** This circuit(s) may be load managed when the parking brake is set.

4.28.176 SPARE CIRCUIT - There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus. The above wires will have the following features:

- 4.28.176.1** The positive wire will be connected directly to the battery power
- 4.28.176.2** The negative wire will be connected to ground
- 4.28.176.3** Wires will be protected to 20 amps at 12 volts DC
- 4.28.176.4** Power and ground will terminate one (1) each in D4 / P4, D3 / P3 up high, to one side of the compartment
- 4.28.176.5** Termination will be with 3/8" studs and plastic covers
- 4.28.176.6** Wires will be sized to 125% of the protection
- 4.28.176.7** This circuit(s) may be load managed when the parking brake is set.

4.28.177 EMERGENCY LIGHT SWITCHES - The emergency light switching will work as follows: The emergency master switch must be activated for all emergency lighting to function. 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. All emergency lighting will be turned on whenever the emergency master switch is turned on. Individual emergency light switches may be deactivated and/or reactivated after the emergency master switch is turned on. 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.

4.28.178 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:

- 4.28.178.1** CD Player with Electronic Skip Protection (ESP)
- 4.28.178.2** Full 7-Channel NOAA Weatherband Tuner with SAME technology
- 4.28.178.3** Built-in Clock
- 4.28.178.4** Audio CD, CD-R, R/W, MP3 CD compatible
- 4.28.178.5** Radio Broadcast Data System Text Display
- 4.28.178.6** Front panel USB input
- 4.28.178.7** Front and Rear Auxiliary Audio Input
- 4.28.178.8** Receives audio (A2DP/AVRCP) from Bluetooth enabled device
- 4.28.178.9** Supports Bluetooth HFP to receive phone calls from BT-enabled phones
- 4.28.178.10** Low battery alert
- 4.28.178.11** Heavy Duty design with Conformal Coated Circuit Boards for maximum durability under all conditions

4.28.179 SWITCH, MASTER, AM/FM RADIO - There will be a remote switch provided inside the cab to control the AM/FM radio. The switch will be installed driver side switch panel. The radio will automatically turn on with when the battery switch is turned on.

4.28.180 PUSH BUTTON MOUNTING BRACKET - A mounting bracket will be provided chrome buttons will be in the wedge bracket near the officer. Match to job 29765 and 29674, 30782, see pictures. They will locate near edge 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.

4.28.181 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:

- 4.28.181.1 Operate in temperatures from -40 to 185 degrees Fahrenheit
- 4.28.181.2 An Optical Gel will be placed between the LCD and protective lens
- 4.28.181.3 Five weather resistant user interface switches
- 4.28.181.4 Grey with black accents
- 4.28.181.5 Sunlight Readable
- 4.28.181.6 Linux operating system
- 4.28.181.7 Minimum of 1000nits rated display
- 4.28.181.8 Display can be changed to an available foreign language
- 4.28.181.9 A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- 4.28.181.10 Programmed to read US Customary

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

- 4.28.182.1 An amber background/text color will indicate a caution condition
- 4.28.182.2 A red background/text color will indicate a warning condition
- 4.28.182.3 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.
- 4.28.182.4 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.

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

- 4.28.183.1 Vehicle Mitigation (if equipped)
- 4.28.183.2 Water Level (if the water level system includes compatible communications to the information center)
- 4.28.183.3 Foam Level (if the foam level system includes compatible communications to the information center)
- 4.28.183.4 Seat Belt Monitoring Screen
- 4.28.183.5 Tire Pressure Monitoring (if equipped)
- 4.28.183.6 Digital Speedometer
- 4.28.183.7 Active Alarms

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

- 4.28.184.1 Battery Voltage
- 4.28.184.2 Fuel
- 4.28.184.3 Oil Pressure
- 4.28.184.4 Coolant Temperature
- 4.28.184.5 RPM
- 4.28.184.6 Water Level (if equipped)
- 4.28.184.7 Foam Level (if equipped)
- 4.28.184.8 Foam Concentration (if equipped)
- 4.28.184.9 Water Flow Rate (if equipped)
- 4.28.184.10 Water Used (if equipped)
- 4.28.184.11 Active Alarms

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

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

- 4.28.186.1** Diagnostics
- 4.28.186.2** Faults
- 4.28.186.3** Load Manager - A list of items shall 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.
- 4.28.186.4** Systems: Command Zone, Foam (if equipped), Pressure Controller (if equipped), Generator Frequency (if equipped), Live Data - General Truck Data, Maintenance, Setup, Open Door Indicators, and alarms.

4.28.187 VEHICLE DATA RECORDER – Vehicle shall be equipped with the standard 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. The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- 4.28.187.1** Vehicle Speed - MPH
- 4.28.187.2** Acceleration - MPH/sec
- 4.28.187.3** Deceleration - MPH/sec
- 4.28.187.4** Engine Speed - RPM
- 4.28.187.5** Engine Throttle Position - % of Full Throttle
- 4.28.187.6** ABS Event - On/Off
- 4.28.187.7** Seat Occupied Status - Yes/No by Position
- 4.28.187.8** Seat Belt Buckled Status - Yes/No by Position
- 4.28.187.9** Master Optical Warning Device Switch - On/Off
- 4.28.187.10** Time - 24 Hour Time
- 4.28.187.11** Date - Year/Month/Day

4.28.188 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:

- 4.28.188.1** Seat Occupied & Buckled = Green LED indicator illuminated
- 4.28.188.2** Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- 4.28.188.3** No Occupant & Buckled = Red LED indicator with audible alarm
- 4.28.188.4** No Occupant & Unbuckled = No indicator and no alarm
- 4.28.188.5** The seat belt monitoring screen will become active on the Command Zone color display when the home screen is active, and there is any occupant seated but not buckled or any belt buckled with an occupant, and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.
- 4.28.188.6** 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.

4.28.189 INTERCOM SYSTEM

- 4.28.189.1** 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.
- 4.28.189.2** 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.
- 4.28.189.3** There will be one (1) wireless base station for up to five (1-5) headset users provided.

- 4.28.189.4** The wireless base station will have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range.
- 4.28.189.5** The following Firecom components will be provided: (1) 5200D Intercom and (1) WB505R wireless base station (1-5 wireless positions); including all necessary power and station cabling.
- 4.28.190 WIRELESS UNDER HELMET, RADIO TRANSMIT ONLY HEADSET** - There will be six (6) 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 rear facing seat, driver's side inboard rear facing seat, passenger's side inboard rear facing seat and passenger's side outboard rear facing seat. Each headset will feature:
- 4.28.190.1** Noise cancelling electric microphone
 - 4.28.190.2** Flexible microphone boom
 - 4.28.190.3** Ear seals with 20 dB noise reduction
 - 4.28.190.4** Stereo Listen-Through Ear dome microphones
 - 4.28.190.5** Radio Push To Transmit button (Left or Right Side)
 - 4.28.190.6** Rechargeable battery operates for 24 hours on a full charge
 - 4.28.190.7** IP-66 when worn
- 4.28.191 MOBILE 2-WAY RADIO** - There will be one (1) Harris, Model Unity XG-200M mid power mobile radio(s) provided cab. The following will be provided for each:
- 4.28.191.1** P25 Trunking and EDACS software
 - 4.28.191.2** Remote Control head CH721
 - 4.28.191.3** Palm microphone
 - 4.28.191.4** Auxiliary speaker
- 4.28.192 MDT SYSTEM** - There will be one (1) Data 911, Model M7 mobile data terminal provided ps radio compt.
- 4.28.193 HEADSET HANGERS** - There will be six (6) headset hanger(s) installed driver's seat, officer's seat, driver's side inboard rear facing seat, driver's side outboard rear facing seat, passenger's side inboard rear facing seat and passenger's side outboard rear facing seat. The hanger(s) will meet NFPA 1901, Section 14.1.11, requirement for equipment mounting.
- 4.28.194 CRADLE POINT MULTI-BAND ROUTER** - A cradle point multiband router for AT&T, model IBR1100LPE-AT will be provided and mounted ps radio compt. A multi-band N-MIMO Cell and GPS antenna, white will be included.
- 4.28.195 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.
- 4.28.196 COMPLETE MDT INSTALLATION** - There will be one (1) Mobile Data Terminal (MDT), Docking station, Mounting bracket, power supply, antenna, GPS, modem, and all cabling sent to the apparatus manufacturers preferred installer shall be installed cab. Specific shipping requirements will be followed.
- 4.28.197 TWO WAY RADIO INSTALLATION** - There shall be one (2) two-way radio(s) installed cab by EVS in Houston TX. This labor allowance option does not include any radio equipment, antenna mounts, whips, mounting bracketry, etc. that may be required to complete the installation.
- 4.28.198 PORTABLE RADIO CHARGER INSTALLATION** - There will be six (6) customer supplied portable two-way radio chargers(s) sent to the apparatus manufacturers preferred radio installer shall be installed cab and crew cab. Specific shipping requirements will be followed.
- 4.28.199 GPS / MULTIMODE ANTENNA INSTALLATION** - There will be one (2) GPS / Multimode antenna(s) with stud mount for thick roof material shall be installed on the roof. The antenna coax cable(s) will be run per the packing list / instructions provided to the third party installer. Specific shipping requirements will be followed. The GPS / Multimode antenna will be sent to the apparatus manufacturers preferred installer prior to cab fabrication.

4.28.200 SPECIAL WIFI ANTENNA MOUNT LOCATION - The Command Zone advanced electronics WiFi-GPS antenna will be relocated from its standard right crewcab roof location forward on the cab roof on the right side. When relocating this antenna, it must be located a minimum of nine (9) inches away from any other metallic object.

4.28.201 RADIO ANTENNA MOUNT - There will be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed One to the rear of the driver and officer side a/c routed to the radio box behind the officer. Make sure there is at least 2' of cable to get outside the box if needed 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.

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

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

4.28.202.2 One (1) camera located on the body to view the light tower when it is stowed on the rear of the recess passenger side, manually activated.

4.28.202.3 The camera images will be displayed on the driver's vehicle information center display.

4.28.202.4 Audio from the microphone on the rear camera will be not provided. The following components will be included:

4.28.202.4.1 Two (2) SV-CW134639CAI Cameras

4.28.202.4.2 One (1) Amplified speaker (if applicable)

4.28.202.4.3 All necessary cables

4.28.203 CAMERA SWITCH - There will be one (1) Front camera manual activation multiplexed hardwired switch located in the cab Panel 8 to trigger the front camera view on the vehicle information center display.

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

4.28.205 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.

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

4.28.205.2 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.

4.28.206 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.

4.28.207 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.

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

- 4.28.208.1** Green LED indicator light for module power
- 4.28.208.2** Red LED indicator light for network communication stability status
- 4.28.208.3** Control system self-test at activation and continually throughout vehicle operation
- 4.28.208.4** No moving parts due to transistor logic
- 4.28.208.5** Software logic control for NFPA mandated safety interlocks and indicators
- 4.28.208.6** Integrated electrical system load management without additional components
- 4.28.208.7** Integrated electrical load sequencing system without additional components
- 4.28.208.8** Customized control software to the vehicle's configuration
- 4.28.208.9** Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- 4.28.208.10** Complete operating and troubleshooting manuals
- 4.28.208.11** USB connection to the main control module for advanced troubleshooting
- 4.28.208.12** To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:
 - 4.28.208.13** Module circuit board will meet SAE J771 specifications
 - 4.28.208.14** Operating temperature from -40C to +70C
 - 4.28.208.15** Storage temperature from -40C to +70C
 - 4.28.208.16** Vibration to 50g
 - 4.28.208.17** IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
 - 4.28.208.18** Operating voltage from eight (8) volts to 16 volts DC
 - 4.28.208.19** The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

4.28.209 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.

4.28.210 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:

- 4.28.210.1** Text description of active warning or caution alarms
- 4.28.210.2** Simplified warning indicators
- 4.28.210.3** Amber caution indication with intermittent alarm
- 4.28.210.4** Red warning indication with steady tone alarm

4.28.211 TECH MODULE WITH WIFI - An in-cab module will provide WiFi wireless interface and data logging capability. 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.

- 4.28.211.1** 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.
- 4.28.211.2** 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.
- 4.28.211.3** 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.

- 4.28.212 PROGNOSTICS** - A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events. 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:
- 4.28.213** Engine oil and filter
 - 4.28.214** Transmission oil and filter
 - 4.28.215** Pump oil (if equipped)
 - 4.28.216** Foam oil (if equipped)
 - 4.28.217** Aerial oil and filter (if equipped)
- 4.28.218 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.
- 4.28.219 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.
- 4.28.220 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.
- 4.28.221 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:
- 4.28.221.1** 12-volt 40-amp battery switched power
 - 4.28.221.2** 12-volt 60-amp ignition switched power
 - 4.28.221.3** 12-volt 60-amp direct battery power
 - 4.28.221.4** There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.
- 4.28.222 ENHANCED SOFTWARE** - The solid-state control system will include the following software enhancements:
- 4.28.222.1** All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.
 - 4.28.222.2** 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.
 - 4.28.222.3** 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.
- 4.28.223 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.
- 4.28.223.1** 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.

4.28.223.2 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.

4.28.224 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:

4.28.224.1 All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

4.28.224.2 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.

4.28.224.3 Electrical components designed shall 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.

4.28.224.4 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).

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

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

4.28.224.7 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.

4.28.224.8 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.

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

4.28.225 BATTERY SYSTEM - There will be six (6) 12-volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

4.28.225.1 950 CCA, cold cranking amps

4.28.225.2 190-amp reserve capacity

4.28.225.3 High cycle

4.28.225.4 Group 31

4.28.225.5 Rating of 5700 CCA at 0 degrees Fahrenheit

4.28.225.6 140 minutes of reserve capacity

4.28.225.7 Threaded stainless steel studs

4.28.225.8 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.

4.28.225.9 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.

4.28.226 BATTERY SYSTEM - A single starting system will be provided. An ignition switch and starter button will be located on the instrument panel.

- 4.28.227 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. An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.
- 4.28.228 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.
- 4.28.229 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.
- 4.28.230 BATTERY CHARGER** - There will be a Kussmaul™ 1200, Model 091-187-12-Remote, 40-amp battery charger provided with Model 091-199-001 remote bar graph display. The Model 091-199-001 display will be shipped to the customer with the loose equipment. There will be a Kussmaul Model 091-198-12-PP remote display installed on the apparatus red. The display will be connected to the 12-volt DC electrical system and the air pressure will be connected to the apparatus air brake system. The battery charger will be wired to the AC shoreline inlet. Battery charger/compressor will be located behind the driver's seat. The battery charger indicator will be located behind the driver's door on the outside of the cab.
- 4.28.231 SHORELINE INLET** - 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. The shoreline will be connected to battery charger and air compressor. The shoreline inlet cover color shall be red. The connector body will be released from the inlet when the apparatus engine start button is activated. There will be a mating connector body supplied with the loose equipment. There will be a label installed near the inlet(s) that state the following:
- 4.28.231.1** Line Voltage
 - 4.28.231.2** Current Rating (amps)
 - 4.28.231.3** Phase
 - 4.28.231.4** Frequency
 - 4.28.231.5** The shoreline receptacle will be located on the driver side of cab, above wheel.
- 4.28.232 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.
- 4.28.233 ELECTRICAL STUD COVERS** - There will be five (5) 3.46" radius black plastic covers with 3/8 NC threads installed on the electrical studs located all power studs in frame rail.
- 4.28.234 POWER DISTRIBUTION RELOCATE** - The relays/solenoids and fuses located in the frame rail will be located in between the frame rails, on the driver side, as high as possible. There will be an aluminum cover installed around the components to help deflect water and steam.
- 4.28.235 SPECIAL LOCATED JUNCTION BOX** - The junction box normally located behind the DS front cab door step for the shoreline will be relocated to inside the cab.
- 4.28.236 RELOCATE, REAR COMMAND ZONE POWER DISTRIBUTION** - The command zone modules at the rear of the truck will be relocated to behind the fuel tank. The module will be mounted vertical and as high as possible.
- 4.28.237 GUARD** - There will be an aluminum cover installed around the relays/solenoids and fuses located in the frame rail to help deflect water and steam.
- 4.28.238 SPECIAL LOCATION POWER & GROUND STUDS** - All of the chassis power and ground studs will be mounted to the bottom of the chassis frame for easy accessibility.

4.28.239 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. 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:

- 4.28.239.1** System voltage monitoring.
- 4.28.239.2** A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- 4.28.239.3** Sixteen available electronic load shedding levels.
- 4.28.239.4** Priority levels can be set for individual outputs.
- 4.28.239.5** High Idle to activate before any electric loads are shed and deactivate with the service brake.
- 4.28.239.6** If enabled:
 - 4.28.239.6.1** "Load Man Hi-Idle On" will display on the information center.
 - 4.28.239.6.2** Hi-Idle will not activate until 30 seconds after engine start up.
- 4.28.239.7** Individual switch "on" indicator to flash when the particular load has been shed.
- 4.28.239.8** The information center indicates system voltage.
- 4.28.239.9** The information center, where applicable, includes a "Load Manager" screen indicating the following:
 - 4.28.239.9.1** Load managed items list, with priority levels and item condition.
 - 4.28.239.9.2** Individual load managed item condition:
 - 4.28.239.9.3** ON = not shed
 - 4.28.239.9.4** SHED = shed

4.28.240 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.

- 4.28.240.1** 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.
- 4.28.240.2** 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.
- 4.28.240.3** When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.
- 4.28.240.4** Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:
 - 4.28.240.4.1** Cab Heater and Air Conditioning
 - 4.28.240.4.2** Crew Cab Heater (if applicable)
 - 4.28.240.4.3** Crew Cab Air Conditioning (if applicable)
 - 4.28.240.4.4** Exhaust Fans (if applicable)
 - 4.28.240.4.5** Third Evaporator (if applicable)

4.28.241 HEADLIGHTS - There will be four (4) HiViz FT-575RD-MOUNT-4KIT

- 4.28.241.1** The LEDs included in the outer section of the headlights will be controlled per the following:
 - 4.28.241.1.1** Activated when the battery switch is on, the ignition switch is on and the parking brake is released.
 - 4.28.241.1.2** Deactivated when the headlight switch is on or the high-beam flash is on or when the parking brake is applied.

- 4.28.242 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.
- 4.28.243 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.
- 4.28.244 CAB CLEARANCE/MARKER/ID LIGHTS** - There will be seven (7) Whelen, Model 0SA00MCR, amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:
- 4.28.244.1** Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
 - 4.28.244.2** Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
 - 4.28.244.2.1** Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.
- 4.28.245 REAR CLEARANCE/MARKER/ID LIGHTING** - There will be three (3) Whelen®, Model 0SR00MCR, LED lights with a chrome flange used as identification lights located at the rear of the apparatus per the following:
- 4.28.245.1** As close as practical to the vertical centerline
 - 4.28.245.2** Centers spaced not less than 6.00" or more than 12.00" apart
 - 4.28.245.3** Red in color
 - 4.28.245.4** All at the same height
- 4.28.246** There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:
- 4.28.246.1** To indicate the overall width of the vehicle
 - 4.28.246.2** One (1) each side of the vertical centerline
 - 4.28.246.3** As near the top as practical
 - 4.28.246.4** Red in color
 - 4.28.246.5** Shall be visible from the rear
 - 4.28.246.6** All at the same height
- 4.28.247** There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed on the side of the apparatus as marker lights as close to the rear as practical per the following:
- 4.28.247.1** To indicate the overall length of the vehicle
 - 4.28.247.2** One (1) each side of the vertical centerline
 - 4.28.247.3** As near the top as practical
 - 4.28.247.4** Red in color
 - 4.28.247.5** Shall be visible from the side
 - 4.28.247.6** All at the same height
- 4.28.248** 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.
- 4.28.249** 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.
- 4.28.250 REAR FMVSS LIGHTING** - The rear stop/tail and directional LED lighting will consist of the following: Two (2) Whelen®, Model M6BTT, red LED stop/tail lights; Two (2) Whelen, Model M6T, amber LED arrow turn lights. The lights shall be provided with clear lenses. The lights will be mounted in a polished combination housing. There will be two (2) Whelen Model M6BUW, LED backup lights provided in the tail light housing.

- 4.28.251 LICENSE PLATE BRACKET** - One (1) license plate bracket constructed of stainless steel will be provided at the rear of the apparatus. One (1) white LED light will be provided to 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.
- 4.28.252 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.
- 4.28.253 TAIL LIGHT MOUNTING INFORMATION** - The following lights shall be installed in the following order from the top down:
- 4.28.253.1** The top lights shall be brake tail lights.
 - 4.28.253.2** The second lights from the top shall be the directional lights.
 - 4.28.253.3** The third lights from the top shall be back-up lights.
 - 4.28.253.4** The bottom light shall be the warning lights.
- 4.28.254 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.
- 4.28.255 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 then a clear voice tells the operator the countdown of the remaining distance in feet as the vehicle reverses.
- 4.28.256 MARKER LIGHTS** - There will be one (1) pair of amber and red Britax, Model L427.203.L12, LED marker lights with rubber arm, located on the side rear corner body each side in standard location, seal the hole in the arm so it does not collect water. The amber lens will face the front and the red lens will face the rear of the truck and be the most rearward marker light. These lights will be activated with the running lights of the vehicle and when the respective directional lights are activated.
- 4.28.257 DEUTSCH CONNECTIONS** - All external 12V electrical light connections will be installed with Deutsch connectors.
- 4.28.258 CAB PERIMETER SCENE LIGHTS** - There will be four (4) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" white LED strip lights provided. 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.
- 4.28.258.1** One (1) under the driver's side cab access step.
 - 4.28.258.2** One (1) under the passenger's side cab access step.
 - 4.28.258.3** One (1) under the passenger's side crew cab access step.
 - 4.28.258.4** One (1) under the driver's side crew cab access step.
- 4.28.259 BODY PERIMETER SCENE LIGHTS** - There will be two (2) Amdor, Model AY-LB-12HW020, 350 lumens, 20.00" long, white LED's, 12-volt DC lights provided at the rear step area of the body, one (1) each side shining to the rear. The perimeter scene lights will be activated when the parking brake is applied, either directional light is activated, activating all side facing perimeter lights and the reverse signal activated, activating all the side facing perimeter lights.
- 4.28.260 ADDITIONAL PERIMETER LIGHTS** - There will be ten (10) lights - Amdor® Model AY-LB-12HW020, 350 lumens, 20.00" long, with white LED's installed with 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 compartment D4, one (1) light under compartment P4, one (1) light under compartment D5, one (1) light under compartment P5, one (1) light under compartment D6 and one (1) light under compartment P6. With the chassis battery switch energized, the lights will be activated by the same means as the body perimeter lights.

4.28.261 STEP LIGHTS - Step lights will be provided both at the rear of the body and in the recessed walkway on the roof of the body. All step lights will be white LED lights. There will be one (1) step light provided on each side of the tailboard at the rear of the body. There will be one (1) chrome plated hooded step light provided every 4' in the recessed walkway. Additional step lights will be installed, if a roof access ladder is installed on the rear of the apparatus, there will be one (1) step light installed at the top of each roof access ladder.

4.28.261.1 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.

4.28.261.2 The step lights will be controlled by a switch installed at the rear of the unit in an easily accessible area.

4.28.261.3 All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

4.28.262 ADDITIONAL STEP LIGHT - Additional lighting will be provided by white LED step lights. The step lights will be installed center of the rear fender, below the winch door, connect to the step light circuit. The quantity of additional step lights will be two (2) lights. 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 additional step lights will be activated by the same means as the standard step lights.

4.28.263 12 VOLT LIGHTING - There will be two (2) Fire Research Spectra Max, Model SPA260-Q20, 12-volt LED surface mounted scene light(s) with white bezel(s) provided rear of the body. The light(s) will be controlled in the following way:

4.28.263.1 A switch at the driver's side switch panel

4.28.263.2 A switch at the passenger's side switch panel

4.28.263.3 No additional switch location

4.28.263.4 A switch in a stainless steel cup located at the rear no more than 62.00" from the ground

4.28.263.5 The light(s) may be load managed when the parking brake is applied.

4.28.264 12 VOLT LIGHTING - There will be three (3) Fire Research Spectra Max, Model SPA260-Q20, 12-volt LED surface mounted scene light(s) with white bezel(s) provided front and rear corners of the body and side of cab above the crew cab window, DS. The light(s) will be controlled in the following way:

4.28.264.1 A switch at the driver's side switch panel

4.28.264.2 A switch at the passenger's side switch panel

4.28.264.3 No additional switch location

4.28.264.4 No additional switch location

4.28.264.5 The light(s) may be load managed when the parking brake is applied.

4.28.265 12 VOLT LIGHTING - There will be three (3) Fire Research Spectra Max, Model SPA260-Q20, 12 volt LED surface mounted scene light(s) with white bezel(s) provided front and rear corners of the body and side of cab above the crew cab window, PS. The light(s) will be controlled in the following way:

4.28.265.1 A switch at the driver's side switch panel

4.28.265.2 A switch at the passenger's side switch panel

4.28.265.3 No additional switch location

4.28.265.4 No additional switch location

4.28.265.5 The light(s) may be load managed when the parking brake is applied.

4.28.266 12 VOLT LIGHTING - There will be two (2) Fire Research Spectra MAX-S, Model SPA851-A28-*, 12-volt DC LED combination spot/flood light(s) provided on the front visor, one (1) on the driver's side and one (1) on the passenger's side. The painted parts of this light assembly shall be white with a white bezel. The light(s) will be steady burning with the selected switch features. The light(s) will be controlled by the following:

- 4.28.266.1** A switch at the driver's side switch panel
- 4.28.266.2** A switch at the passenger's side switch panel
- 4.28.266.3** No additional switch location
- 4.28.266.4** No additional switch location
- 4.28.266.5** These light(s) may be load managed when the parking brake is applied.

4.28.267 WALKING SURFACE LIGHT - There will be three (3) Model P25 12-volt DC LED lights provided, in lieu of the standard lights, to illuminate the entire cargo area. These LED lights will be located on the surface of the front body side sheet to illuminate the cargo area. These lights will be activated when the body step lights are on. NOTE: These lights are used in lieu of the standard lights, due to an overall height restriction, with the body side sheets being the highest point of the apparatus.

4.28.268 HEAVY DUTY RESCUE BODY CONSTRUCTION - The body will be built as a separate module prior to being mounted onto the substructure. The rescue body will be constructed of 5052 aluminum. The structural support framing and the gussets used will be of 2.00" (51 mm) square 0.125" (3 mm) wall 6061 aluminum alloy tubing. All exterior body corners will be 3.00" (76 mm) radius aluminum, corrosion resistant alloy 6061 extrusions. Spacing of the 2.00" (51 mm) vertical supports will not exceed 14.00" (356 mm) on center. The roof and corner extrusions will be reinforced with interconnecting gusset supports at all stress points. The body will be properly welded into a unitized construction. Proper reinforcing and supports will be utilized throughout the entire construction process to ensure strength and rigidity.

- 4.28.268.1** The body will be supported by 2.00" (51 mm) x 2.00" (51 mm) x 0.25" (6 mm) wall aluminum tubing. The cross sill tubes will be spaced approximately 15.00" (381 mm) on center and interconnected to the body from front to rear.
- 4.28.268.2** A 1.00" (25 mm) x 3.00" (76 mm) aluminum bar will be used as a stringer and will be welded to the cross sills. The stringer will be used to mount the body to the chassis frame rails.

4.28.269 ROOF CONSTRUCTION - The roof will be integral with the body construction. The roof will be constructed of 0.125" (3 mm) bright aluminum treadplate and supported by 2.00" (51 mm) square 0.125" (3 mm) wall tubing welded in place approximately 12.00" (305 mm) on center. The roof will be further reinforced with 2.00" (51 mm) square gussets welded approximately every 48.00" (1219 mm). The roof perimeters will be constructed of a 3.00" (76 mm) radius extrusion with an integral drip molding. The roof extrusion will also have an inset allowing the roof panel shall be recessed into the extrusion giving further support and sealing effect at the outside edge. The roof panel will be welded to the roof extrusions and supports. All roof seams will be continuously welded.

4.28.270 BODY AND COMPARTMENT SUPPORT - The substructure for the body will not be integral with the body but will be a separate assembly. The bottom of each lower compartment floor will be supported by an under slung steel angle grid that will be bolted to the chassis frame rails with grade 8 bolts in order to transfer major stress to the chassis frame and not through the body. The under slung support will be constructed of 0.50" (13 mm) x 2.50" (64 mm) x 2.50" (64 mm) steel angle vertical supports. Horizontal members will be 0.38" (10 mm) x 2.00" (51 mm) x 3.00" (76 mm) and 0.38" (10 mm) x 2.50" (64 mm) x 3.50" (89 mm) steel angle.

- 4.28.270.1** The complete substructure will be washed, primed and finish painted before being bolted to the chassis frame. A rubber coating will be applied over the painted under slung support structure for an additional corrosion barrier.
- 4.28.270.2** A 3.00" (76 mm) x 0.75" (19 mm) rubber liner will be placed on top of the chassis frame rails. The liner will be used to prevent metal to metal contact where the body stringer rests on the chassis frame rails.
- 4.28.270.3** The compartment floors will be bolted to the under slung substructure and the body will be secured to the chassis frame by a minimum of four (4) tie-down assemblies. Each tie-down assembly will consist of two (2) 2.00" (51 mm) x 6.25" (159 mm) x 0.75" (19 mm) steel plates and two (2) 14.00" (356 mm) long, 0.50" (13 mm) diameter steel rods. The tie-downs will be easily accessible so that the body may be removed.

4.28.271 BODY LENGTH - The length of the body will be 282.00" (7,163 mm).

4.28.272 BODY WIDTH - The width of the body will be 100.00" (2,540 mm).

4.28.272.1 Standard Compartment Depth - All standard depth body compartments will measure 28.00" (711 mm) deep from the outside of the body to the rear compartment wall. The usable depth inside each side body compartment will be 26.00" (660 mm) deep.

4.28.272.2 Transverse Compartment - All transverse side body compartments will have a usable depth of 26.00" (660 mm) at the floor level. These compartments will extend over the frame rails through to the other side of the body.

4.28.273 BODY HEIGHT - The height of the body will be 106.25" (2,699 mm) without any roof mounted options.

4.28.274 ROOF CONFIGURATION - The roof of the body will be configured with side hatch compartments, a recessed walkway, and a recessed area for mounting equipment. The recessed area will be located at the front of the body. The side hatch compartments and the recessed walkway will be located rearward of the recessed area. The side hatch compartments will run the length of the body on both sides from the rear up to the recessed area. The side hatch compartments will be provided in the following configuration:

4.28.274.1 There will be two (2) hatch compartments of equal size on each side of the roof.

4.28.274.2 The recessed walkway will be centered between the hatch compartments, running the length of the body up to the recessed area.

4.28.275 RECESSED AREA - The recessed area will be constructed of 0.125" (3 mm) aluminum treadplate and will have two (2) 1.00" (25 mm) diameter drain holes. The drains will be routed to drain below the body. The recessed area will be sized appropriately in order to allow proper mounting space and clearance for all roof mounted equipment where the designated mounting location is the recess on the roof of the body. The maximum allowable depth of the recessed area will be equal to the depth of the recessed walkway. The recess will be configured so that whenever possible, items mounted in the recess will stow below the roof line of the body. If a piece of equipment is taller than the maximum depth of the recess, that item may protrude above the roof line.

4.28.276 HATCH COMPARTMENTS - All compartment doors will be designed to hinge on the outboard side and will be held open with gas cylinder struts. Each compartment door will be provided with a slam style latch with lever handle to hold the door in the closed position. The outside walls of the compartments will be a double wall design to prevent equipment from denting the outside painted surface. A 1.00" (25 mm) diameter drain will be provided on the floor of each compartment. The drains will be routed to drain below the body.

4.28.277 SIZE OF HATCH COMPARTMENTS - The clear width of the side hatch compartments differs depending on the width of the body. All hatch compartments on the roof of the body will have the same clear depth inside the compartment unless listed otherwise. The inside depth can differ depending on the height of the body. The clear depth inside each hatch compartment will be as follows:

BODY HEIGHT	INSIDE DEPTH OF HATCH COMPARTMENTS
90.00"	16.50"
98.00"	24.50"
100.00"	26.50
103.25"	29.50"
106.25	32.50"
Body height not listed here.	Consult factor for depth of hatch compartment.

4.28.278 RECESSED WALKWAY - The recessed walkway will not be less than 30.00" (762 mm) wide. The depth of the walkway will be equal to the depth of the hatch compartments. The walkway will be constructed of aluminum treadplate and reinforced with 0.125" (3 mm) thick, 2.00" (51 mm) square aluminum tubing on 12.00" (305 mm) centers. The treadplate in the walkway will be formed up 90 degrees at least 2.00" (51 mm) on each side to form a double 0.125" (3 mm) vertical wall for a water tight seal. There will be two (2) 1.00" (25 mm) diameter drain holes provided in the walkway. The drains will be routed to drain below the body.

4.28.279 ROLL-UP/SWING DOWN LAP DOOR, SIDE COMPARTMENTS - There will be ten (10) compartment doors installed on the side compartment(s) that will be a combination roll-up/swing down lap door where the lower section of the door is a swing down lap door and the upper section is a roll door. The combination roll-up/swing down lap door style compartment door(s) will be provided all full height doors, including the 2 exteriors on the cab. Any compartment door opening that is not specified as having a roll-up/swing down lap door will be provided with a full height roll-up door unless specified otherwise.

4.28.279.1 The lower swing down lap door will function as a space saving work platform. The platform will be as wide as the compartment door opening and approximately 18.00" (457 mm) deep. The external surface of the platform will be covered in smooth aluminum and painted job color. When folded down, the platform will provide an aluminum treadplate covered stepping surface with a rated capacity of 500 lb (227 kg). A handrail will be provided on one (1) side of the compartment for safe access to the platform. A D-Ring latch will be provided to secure the lower section of the door in the stored position.

4.28.279.2 The roll-up door section will be double faced, aluminum construction, painted one (1) color to match the lower portion of the body. The door will be manufactured by AMDOR™ brand roll-up doors.

4.28.279.3 Doors will be constructed using 1.00" (25 mm) 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 structurally 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.

4.28.279.4 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 fin will serve as a wiping seal which will also allow for compression to prevent water ingress.

4.28.279.5 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 the bottom panel will be manufactured utilizing non-marring materials.

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

4.28.279.7 A stainless-steel lift bar shall 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 shall 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.

4.28.279.8 All injection molded roll-up door wear components will be constructed of Type 6 Nylon.

4.28.279.9 Each roll-up door will have a 3.00" (76 mm) diameter ballancer/tensioner drum to assist in lifting the door (garage door style will not acceptable).

4.28.279.10 The header for the roll-up door assembly will not exceed 4.00" (102 mm).

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

4.28.280 EXTERIOR COMPARTMENTS - The exterior compartment layout, dimensions and requirements will be minimum specifications. The doors will be able to withstand years of rugged service and wear. For this reason, the compartment door design, metal thickness and attachments will be strictly adhered to. The compartment will be constructed of .125" (3 mm)-corrosion resistant aluminum alloy, including all interior panels, floor and sides. The assemblies will be held inside fixtures while being welded. Compartment flooring will be of the sweep out design with the floor higher than the compartment door frame. All compartments will be supported on top, rear and bottom. The rear wall of each exterior compartment will be welded to the cross sills. Drip protection will be provided over all door openings with an integral roof extrusion or aluminum extrusion.

4.28.281 WHEEL WELLS - The rear fenders will be an integral part of the body sides and compartments. The inside of the fender will be fitted with a full circular inner fender liner. All screws and bolts, which protrude into a compartment, will have acorn nuts attached.

4.28.282 LEFT FORWARD COMPARTMENTS:

- 4.28.282.1 First Compartment** - The first compartment will be located directly behind the cab. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.50" (1,283 mm) wide x 74.88" (1,902 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.50" (1,283 mm) wide x 57.25" (1,454 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 72.00" (1,829 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 66.00" (1,676 mm) high.
- 4.28.282.2 Second Compartment** - The second compartment will be located behind the first compartment and directly ahead of the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.88" (1,292 mm) wide x 74.88" (1,902 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1,292 mm) wide x 57.25" (1,454 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 72.00" (1,829 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 66.00" (1,676 mm) high.
- 4.28.282.3 Compartment Loading** - Each compartment will be capable of holding 1,100 lb (499 kg). The area over the frame rails in each compartment will be capable of holding an additional 1,000 lb (454 kg).

4.28.283 LEFT OVER WHEEL COMPARTMENTS:

- 4.28.283.1 Forward Compartment** - A compartment will be provided above the forward tandem wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 54.38" (1,381 mm) wide x 46.13" (1,172 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 43.25" (1,099 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 38.25" (972 mm) high.
- 4.28.283.2 Rear Compartment** - A compartment will be provided above the rear tandem wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 57.00" (1,448 mm) wide x 46.13" (1,172 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 43.25" (1,099 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 38.25" (972 mm) high.
- 4.28.283.3 Compartment Loading** - Each compartment will be capable of holding 1,200 lb (545 kg).

- 4.28.284 LEFT REAR SIDE COMPARTMENT** - The left rear side compartment will be located directly behind the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 62.50" (1,588 mm) wide x 74.88" (1,902 mm) high. The compartment door frame opening will be 60.00" (1,524 mm) wide x 72.00" (1,829 mm) high. The compartment clear door opening will be 57.50" (1,461 mm) wide x 66.00" (1,676 mm) high. The compartment will be capable of holding 1,400 lb (636 kg).

4.28.285 RIGHT FORWARD COMPARTMENTS:

- 4.28.285.1 First Compartment** - The first compartment will be located directly behind the cab. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.50" (1,283 mm) wide x 74.88" (1,902 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.50" (1,283 mm) wide x 57.25" (1,454 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 72.00" (1,829 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 66.00" (1,676 mm) high.
- 4.28.285.2 Second Compartment** - The second compartment will be located behind the first compartment and directly ahead of the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 50.88" (1,292 mm) wide x 74.88" (1,902 mm) high. The compartment will be transverse, extending through to the other side of the body. The area over the frame rails will be 50.88" (1,292 mm) wide x 57.25" (1,454 mm) high. The compartment door frame opening will be 48.00" (1,219 mm) wide x 72.00" (1,829 mm) high. The compartment clear door opening will be 45.50" (1,156 mm) wide x 66.00" (1,676 mm) high.
- 4.28.285.3 Compartment Loading** - Each compartment will be capable of holding 1,100 lb (499 kg). The area over the frame rails in each compartment will be capable of holding an additional 1,000 lb (454 kg).

4.28.286 RIGHT OVER WHEEL COMPARTMENTS:

- 4.28.286.1 Forward Compartment** - A compartment will be provided above the forward tandem wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 54.38" (1,381 mm) wide x 46.13" (1,172 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 43.25" (1,099 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 38.25" (972 mm) high.
- 4.28.286.2 Rear Compartment** - A compartment will be provided above the rear tandem wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 57.00" (1,448 mm) wide x 46.13" (1,172 mm) high. The compartment door frame opening will be 51.50" (1,308 mm) wide x 43.25" (1,099 mm) high. The compartment clear door opening will be 49.00" (1,245 mm) wide x 38.25" (972 mm) high.
- 4.28.286.3 Compartment Loading** - Each compartment will be capable of holding 1,200 lb (545 kg).
- 4.28.287 RIGHT REAR SIDE COMPARTMENT** - The right rear side compartment will be located directly behind the rear wheels. The compartment will be provided with a full-height roll-up door. The compartment dimensions will be 62.50" (1588 mm) wide x 74.88" (1902 mm) high. The compartment door frame opening will be 60.00" (1524 mm) wide x 72.00" (1829 mm) high. The compartment clear door opening will be 57.50" (1461 mm) wide x 66.00" (1676 mm) high. The compartment will be capable of holding 1,400 lb (636 kg).

4.28.288 REAR COMPARTMENT ROLL-UP DOOR –

- 4.28.288.1** A roll-up door will be installed on the rear compartment. The door will be double faced, aluminum construction manufactured by AMDOR™ brand roll-up doors. The door will be painted one (1) color to match the lower portion of the body.
- 4.28.288.2** The door will be constructed using 1.00" (25 mm) 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.
- 4.28.288.3** Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The other fin will serve as a wiping seal which will also allow for compression to prevent water ingress.
- 4.28.288.4** The door 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 must be manufactured utilizing non-marring materials.
- 4.28.288.5** The bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.
- 4.28.288.6** A stainless-steel lift bar shall 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 shall 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.
- 4.28.288.7** All injection molded roll-up door wear components will be constructed of Type 6 Nylon.
- 4.28.288.8** The door will have a 3.00" (76 mm) diameter ballancer/tensioner drum to assist in lifting the door (garage door style).
- 4.28.288.9** The header for the roll-up door assembly will not exceed 4.00" (102 mm).
- 4.28.288.10** A heavy-duty magnetic switch will be used for control of "open compartment door" warning lights.
- 4.28.288.11** **Dimensions of Roll-Up Door –** The door frame opening shall be 44.00" W x 72.00" H. The clear door opening shall be 41.75" x 65.13". The interior rear compartment shall have a body width of 100.00" with willow compts. The interior width of compartment shall be 44.00".
- 4.28.288.12** **Interior Height of Rear Compartment -** The frame rails will extend part of the way into the rear compartment at the floor level creating two (2) different values for the height and depth of the compartment. Both the height and depth of the compartment will be different when measured behind the frame rails as compared to when measured above the frame rails.

Interior Height of Rear Compartment		
	Full Height (Behind Frame Rails)	Height Above Frame Rails
Any Body with Recessed Walkway on Roof of Body	75.00" (1,905 mm)	57.37" (1,457 mm)
90.00" (2,286 mm) High Body without Recessed Walkway	82.75" (2,102 mm)	65.12" (1,654 mm)
98.00" (2,489 mm) High Body without Recessed Walkway	90.75" (2,305 mm)	73.12" (1,857 mm)
Non-Standard Body Height without Recessed Walkway	Dimension available upon request	Dimension available upon request

4.28.289 DEPTH OF REAR COMPARTMENT - The rear compartment will be 26.00" (660 mm) deep at the floor level behind the frame rails. The depth of the rear compartment above the frame rails can vary according to the configuration of the body. This dimension is dependent upon both the width and depth of the following compartments: Left Rear Side Compartment, Right Rear Side Compartment, Tandem Left Over the Wheel Compartments, and Tandem Right Over the Wheel Compartments:

Depth of Rear Compartment Over the Frame				
	48.00" Rear Side Compts	60.00" Rear Side Compts	Rear Side Compts: Width Not Listed Here	Rear Side Compts: Transverse (Any Width)
Standard Over Wheel Compts	165.25" (4,197 mm)	177.25" (4,502 mm)	Width of Side Rear Compts + 117.25" (2,978 mm)	No rear compartment. Door only.
Forward Compt Transverse/Rearward Compt Standard	110.75" (2,813 mm)	122.75" (3,118 mm)	Width of Side Rear Compts + 60.50" (1,537 mm)	No rear compartment. Door only.
Both Over Wheel Compts Transverse	51.88" (1,318 mm)	63.88" (1,623 mm)	Width of side Rear Compts + 5.88" (149 mm)	No rear compartment. Door only.
Over Wheel Compts: Non-Standard Width and/or	Dimension available upon	Dimension available upon	Dimension available upon	No rear compartment.

4.28.290 COMPARTMENT LOADING - The compartment will be capable of holding 1,000 lb (454 kg). The area over the frame rails will be capable of holding an additional 2,000 lb (908 kg).

4.28.291 AWNING MOUNT RECESS - There will be a recess provided in the side of the body to mount an awning. The awning housing will mount inside the recess and will not protrude past the side of the body. Recessing the awning will not interfere with the operation of the awning. The addition of the recess will create a 4.00" protrusion into the adjacent roof area, thereby reducing the amount of space on the roof in the immediate vicinity of the recess. If the recess is adjacent to a hatch compartment, the interior of the hatch compartment will be reduced by 4.00". If the recess is adjacent to a recessed area such as a light tower recess, the amount of space available in the recessed area will be reduced by 4.00". If the recess for the awning protrudes into an interior section, it will reduce the amount of interior space available in the immediate vicinity of the recess. There will be a recess for a total of one (1) awning(s) located passenger side.

4.28.292 STAINLESS STEEL ON BODY CORNERS - There will be two (2) pairs of scuffplate provided, covering the corners of the body located rear corners. The scuffplate will be made of brushed stainless steel. Each section of scuffplate will span the full height of the body from the bottom of the body up to the corner at the top of the body.

4.28.293 ELECTRIC AWNING - An electrically opening and closing awning with 12 VDC electric motor will be supplied. The awning will be stored in a metal enclosure on the side of the body with end fairings for blending into the side of the body when not in use. The awning enclosure will be painted 90 red. A switch will be provided for easy push button convenience inside an adjacent forward compartment. A sensor will be provided to retract the awning automatically in high wind conditions. A manual crank will be provided in the event of a power failure. The awning will be as long as possible with a minimum length of 12' and a maximum length of 17' 11.00". The awning projection will be 9' 9.00" from the body. When fully extended, the awning will be self supported without the use of poles extending to the ground. The awning will activate the Do Not Move Truck indicator circuit to alert the cab occupant(s) that the awning is not in the stowed position when the parking brake is released. **The awning will be red. A total of one (1) will be supplied. The awning will be installed passenger side.**

4.28.294 REAR BUMPER - A bumper will be provided at the rear of the body. The rear bumper will be constructed as an integral part of the rear body substructure with an aluminum treadplate deck mounted to the frame to provide a stepping surface. A 3.00" high kick plate constructed of aluminum treadplate will be provided on the bulkhead surfaces above the bumper. The bumper will be approximately 13.00" deep and as wide as possible. A 3.00" radius will be provided on each corner.

4.28.295 REAR HITCH RECEIVER - A class IV hitch receiver will be installed under the body at the rear of the apparatus. The hitch receiver will be properly reinforced to provide a maximum rating of 10,000 lb no-yield condition with a straight line pull (towing capacity) and a 1,000 lb tongue weight when used with a weight distributing hitch assembly. The hitch receiver will be tested to provide a 2:1 straight line pull no-yield safety factor over the maximum load rating of the hitch receiver. A heavy-duty slide-in tube and ball assembly with retaining pin will be included with the rear hitch receiver.

4.28.295.1 Trailer Wiring - The trailer connection for the rear hitch receiver will be a seven (7)-way flat blade recreational vehicle connector for trailer wiring compatible with electric brake systems, and a second connector with inverted ground meeting SAE J560 standards providing an auxiliary connection for warning devices.

4.28.296 SIDE HITCH RECEIVERS - There will be one (1) hitch receiver installed through the body fender panel between the tandem rear wheels on each side of the body. The hitch receivers will be constructed of heavy steel tubing and reinforced to the apparatus framework. Each hitch receiver will be tested to provide a 2:1 straight line pull no-yield safety factor over a maximum load rating of 10,000 lb.

4.28.296.1 As a result, each of these hitch receivers will be capable of retaining a portable winch with a rating of no more than 10,000 lb. Each hitch receiver will also be capable of being used for rope operations when used with properly rated equipment.

4.28.296.2 A spring loaded stainless steel door will be provided in the fender on each side of the body to cover the ends of receivers. Each door will have a flush latch provided to prevent the door from opening while not in use. A stainless-steel trim ring will be provided to prevent damage to the exterior finish around the opening.

4.28.296.3 A cutout will be provided in the wheel well openings that are adjacent to each hitch receiver to provide access to the receiver pins. A hinged stainless-steel door will be provided in each wheel well opening to cover the cutouts.

4.28.297 SIDE HITCH RECEIVERS - There will be one (1) hitch receiver installed under the body behind the rear wheels on each side of the body. The hitch receivers will be constructed of heavy steel tubing and reinforced to the truck framework. Each hitch receiver will be tested to provide a 2:1 straight line pull no-yield safety factor over a maximum load rating of 10,000 lb. As a result, each of these hitch receivers will be capable of retaining a portable winch with a rating of no more than 10,000 lb. Each hitch receiver will also be capable of being used for rope operations when used with properly rated equipment. The exact position of the receivers rearward of the axle will be under D1 and P1.

4.28.298 ROOF ACCESS LADDER - A Zico model RL-2-6 Quic-Ladder will be provided at the rear of the body. The ladder handrails will be constructed out of 1.25" (3 mm) heavy-walled aluminum tubing that is covered with a black, heat-resistant, powder coated finish. Each step will have a flat non-skid surface that is 3.00" (76 mm) deep x 18.00" (457 mm) wide. A swing-out and down extension section at the bottom of the ladder will be provided. The ladder will be mounted on the right side at the rear of the body.

4.28.299 TIE DOWN - A chrome plated tie down eye rated at 9,000 pound straight pull will be provided for use with any equally rated 2.00" receiver tube on the vehicle. The tie down will be pinned to the receiver tube, allowing the tie down to be used in multiple locations. A total of four (4) will be provided.

4.28.300 ROPE ANCHORS - There will be three (3) pairs of chrome plated steel eyebolts installed on the body to serve as rope anchor points. Each anchor will have an inside diameter of 2.00" (51 mm) and will be supported to provide a maximum of 9,000 lb (4,082 kg) no-yield condition with a straight line pull. Each pair of anchors will be installed in the following locations:

4.28.300.1 One (1) on each side of the body facing the rear just above the tops of the compartments

4.28.300.2 One (1) on each side of the body in the upper corners at the front of the body

4.28.300.3 One (1) on each side of the body in the upper corners at the rear of the body

4.28.300.4 Stainless steel scuff plates will be provided behind each anchor point.

- 4.28.301 TRIM BODY SEAMS** - All body seams will be trimmed with the same material as the body construction and painted to match the body paint.
- 4.28.302 ADJUSTABLE VERTICAL DIVIDER** - An adjustable vertical compartment divider will be provided. The divider will be constructed of 0.12" aluminum. The divider will be fastened to aluminum tracks on the top and bottom to allow side to side adjustment. A total of two (2) divider(s) will be provided P2.
- 4.28.303 ADJUSTABLE HATCH COMPARTMENT DIVIDER** - An adjustable hatch divider made of .12" aluminum will be provided. The divider will be fastened to aluminum tracks on both sides of the hatch interior to allow front to back adjustment. A total of two (2) will be provided one each side.
- 4.28.304 COMPARTMENT DIVIDER** - A .12" thick aluminum vertical compartment divider will be provided in in the rear compartment to separate the plywood rack from the slide out trays and tripod / stokes storage. The divider will be secured in place with #10 self-tapping screws. A total of two (2) divider(s) will be provided.
- 4.28.305 VERTICAL COMPARTMENT DIVIDER** - There will be a total of two (2) vertical compartment divider(s) provided. Each divider will be located 13" from the forward wall of D4 / P4. Each divider will be constructed of 0.12" thick aluminum and secured in place with self tapping screws.
- 4.28.306 FLOOR EXTENSION** - There will be a floor extension from the transversed area over the frame to the compartment door. The extension will have a 1.50" vertical lip and a return bend. The extension will be support by angles off the side partitions of the compartment. A total of nine (9) will be provided and located D1, D3, D4, D5, P1, P3, P4, P5, R1.
- 4.28.307 FLOOR EXTENSION** - The compartment floor will have an additional sheet of 0.18" aluminum formed to provide a 5 degree pitch to the rear. The formed sheet will allow cribbing material to be stored in the compartment without sliding against the door. The pitched floor will be provided in a total of one (1) compartment(s) located P2.
- 4.28.308 RETENTION NETTING** - Retention netting will be provided in a body compartment. The netting will consist of a heavy black nylon webbing made of 2.00" nylon strap with a 2.00" box pattern. The nylon webbing will be fastened to one (1) side of the compartment in a fixed manner. The remaining sides will be provided with quick release style buckles to hold the web closed. Retention netting will be provided for a total of one (1) compartment(s) located P2.
- 4.28.309 STOKES/STRETCHER BASKET RACK** - A rack constructed of one (1) storage trough for Stokes/Stretcher Basket(s) will be installed in a horizontal orientation in compartment rear compartment, above the tripod storage. The clear rack trough dimensions will be 24" wide by 10" high. The rack will be fabricated of .125" aluminum with the exterior finished to match the compartment interior. The interior of the trough(s) will not be finished. There will be no restraint provided to hold the stokes basket(s) in place.
- 4.28.310 PLYWOOD STORAGE RACK** - There will be a rack configured with one (1) storage trough for storing sheets of plywood or fin form board. The storage troughs will be constructed of "U" shaped 16 gauge stainless steel material. The individual troughs will be framed with .13 x 1.50 stainless steel bar. The trough dimensions will be match 22766. The rack will be provided with a single aluminum treadplate door with lift and turn pawl latch to secure the equipment while the apparatus is in motion. The rack will be located rear compartment, next to the slide out trays and tripod / stokes rack.
- 4.28.311 STORAGE MODULE** - A storage module constructed of .12 aluminum will be provided for storage of a tripod in the folded position. The clear dimensions of each storage slot will be 12" w x 12" h x 8 ft. There will be a total of two (2) storage module(s) located Rear compartment. The storage configuration will be provided with no restraint to secure the equipment. This option is for the storage module only. The equipment described is not included in this option.
- 4.28.312 CABLE TRAY LATCH** - A cable release will be provided to allow single handed operation of the latches for tilt trays. A cable will connect the two (2) pull knobs so when you pull the cable from the center, it triggers the dual knobs and releases the tray. The cable will be plastic coated. A total of six (6) will be provided slide tilt trays.

- 4.28.313 PIKE POLE STORAGE** – Aluminum tubing will be used for the storage of four (4) pike pole(s). If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided. The make and model of the pike pole(s) will be: nupla NY hook. The pike pole storage tube(s) will be located very top of R1.
- 4.28.314 REAR BUMPER** - A bumper will be provided at the rear of the body. The rear bumper will be constructed as an integral part of the rear body substructure with an aluminum treadplate deck mounted to the frame to provide a stepping surface. A vertical kick plate constructed of aluminum treadplate will be provided on the body behind the bumper. The kick plate will extend to approximately 3.00" above the surface of the bumper. The bumper will be approximately 13.00" deep and as wide as possible. A 45 degree angle will be provided on each outside corner.
- 4.28.315 REAR WALL, BODY MATERIAL** - The rear wall will be smooth and the same material as the body.
- 4.28.316 TOW EYES** - Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes will have a radius.
- 4.28.317 COMPARTMENT LIGHTING** - There will be eleven (11) compartments with Pierce LED compartment light strips. The strips will be centered vertically along each side of the door framing. Any remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384 light in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb. Opening the compartment door will automatically turn the compartment lighting on.
- 4.28.318 ADDITIONAL COMPARTMENT LIGHTING** - There will be 16 12-volt DC LED strip light(s) provided in the compartment(s) located front and rear of the transverse compartments. Each light will be 42.00" in length. Opening the compartment door(s) will automatically turn the compartment lighting on.
- 4.28.319 HATCH COMPARTMENT LIGHTING** - There will be an LED strip light mounted on the hinged side of the interior in each hatch compartment. Each light will be wired to an automatic door switch and to the "open door" indicator inside the cab.
- 4.28.320 CARGO/DUNNAGE AREA LIGHTING** - There will be two (2), 12 volt DC strips lights with white LEDs and stainless steel protective cover, provided to illuminate the cargo area. One (1) light strip will be installed the entire length of the left side of the cargo area. One (1) light strip will be installed the entire length of the right side of the cargo area. The light(s) will be activated when the battery switch is on and the body step lights are activated.
- 4.28.321 STANDARD DEPTH ADJUSTABLE SHELF** - An adjustable shelf will be provided. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides. The shelf will be as deep as possible for a standard depth compartment, and as wide as possible for the specified mounting location. The shelf will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment. The shelf will have a load capacity of 500 lb. A total of two (2) shelves will be provided P1 below the slide tilt tray.
- 4.28.322 HALF DEPTH ADJUSTABLE SHELF** - An adjustable shelf will be provided for use in a transverse side body compartment. The shelf will be constructed of 0.188" thick aluminum with 2.00" high sides. The shelf will be half depth of the transverse compartment and as wide as possible for the specified mounting location. The shelf will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment. The shelf will have a load capacity of 500 lb. A total of four (4) shelves will be provided to be determined.
- 4.28.323 SINGLE HANDED CABLE LATCH** - A cable will be provided to tie together the two (2) spring loaded locks that are provided as standard at the front of a slide-out/tilt tray in order to provide single hand operation of the tray. The single hand operation cable will be provided on a total of ten (10) slide-out trays located all slide tilt and the adjustable slide out without multistop.

- 4.28.324 STANDARD DEPTH SLIDE-OUT ADJUSTABLE HEIGHT TRAY** - There will be three (3) slide-out trays provided. Each tray will have 2.00" high sides and a capacity rating of up to 500 lb in the extended position. Each tray will be as deep as possible for a standard depth compartment and as wide as possible for the specified mounting location. Each tray will be mounted on a pair of side mounted slides. The slide mechanisms will have ball bearings for ease of operation and years of dependable service. The slides will be mounted to shelf tracks to allow the tray to be adjustable up and down within the designated mounting location. An automatic lock will be provided for both the in and out tray positions. The lock trip mechanism will be located at the front of the tray and will be easily operated with a gloved hand. The tray(s) will be located (2) D1, (1) P1.
- 4.28.325 122.00" DEEP SLIDE-OUT UTILITY TRAY** - There will be two (2) slide-out trays provided for use in the rear compartment. 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. Each tray will have 3.00" high sides, will be 122.00" deep and will be as wide as possible for the designated mounting location. 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 in one (1) direction only. 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 each tray for ease of use with a gloved hand. The vertical location of each tray within the compartment will be adjustable. The tray(s) will be located above the floor mounted.
- 4.28.326 TRANSVERSE TWO (2) WAY SLIDE-OUT MULTI-STOP UTILITY TRAY** - There will be two (2) slide-out trays provided for use in the transverse side body compartment(s). 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. 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. 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. 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. The vertical location of each tray within the compartment will be adjustable. The tray(s) will be located (1) each D3 / P3, D4 / P4, upper locations.
- 4.28.327 STANDARD DEPTH SLIDE-OUT/TILT-DOWN TRAY** - There will be six (6) slide-out trays provided. The bottom of each tray will be constructed of 0.188" thick aluminum while special aluminum extrusions will be utilized for the tray sides, ends, and tracks. The corners will be welded to form a rigid unit. The tray will have 3.00" high sides, will be full depth for a standard depth compartment and will be as wide as possible for the specified mounting location. A spring loaded lock will be provided on each side at the front of the tray. Releasing the locks will allow the tray to slide out approximately two-thirds (2/3) of its length from the stowed position and tip 30 degrees down from horizontal. The tray will be equipped with ball bearing rollers for smooth operation. Rubber padded stops will be provided for the tray in the extended position. The capacity rating of the tray will be a minimum of 200 lb in the extended position. The vertical position of the tray within the compartment will be adjustable. The tray(s) will be located upper portion of D1 front and rear of partition, D2, D5, P1, P5.
- 4.28.328 TWO (2) WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY** - There will be two (2) floor mounted utility slide-out tray(s) provided (1) each D3 / P3, D4 / P4, above the floor extensions. 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 special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be painted to match compartment interior. The tray will be 4.00" high x full depth of the transverse compartment x as wide as possible for the compartment. The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length to either side of the apparatus. The tray will lock in the stowed, half-way, and fully extended positions. 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.

4.28.329 ONE WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY - There will be a floor mounted utility slide-out tray(s) provided in the rear compartment. The tray will be rated for up to 500lb in the extended position. The tray will be constructed of .19" thick aluminum for the tray bottom and special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be painted to match compartment interior. The interior tray dimensions will be approximately 122.00" deep x 3.00" high. The tray will slide out one (1) direction only, two-thirds of its length. The tray will be supported with a minimum of six (6) ball bearing rollers. 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.

4.28.330 ONE WAY UTILITY SLIDE-OUT FLOOR MOUNTED TRAY - There will be two (2) floor mounted utility slide-out tray(s) provided D4 and P4 for the tool boards. 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 special aluminum extrusions for the tray sides, ends and tracks. The corners will be welded. The finish will be painted to match compartment interior. The tray will be 3.00" high x half the depth of the transverse compartment x as wide as possible for the compartment. The tray will be supported with a minimum of six (6) ball bearing rollers. The tray will slide out two thirds (2/3) of its length in one direction. 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.

4.28.331 SLIDE-OUT FLOOR MOUNTED TRAY - There will be ten (10) floor mounted slide-out tray(s) provided (1) D1 full width, (1) D1 each side of partition, (1) D3, (1) D4 rear of reel, (1) D5, (1) P1, (1) P3, (1) P4 rear of reel, (1) R1. Each tray will be constructed of 0.19" aluminum. The finish will be painted to match compartment interior. Each tray will be rated for up to 500 lb in the extended position. The height of each side of the tray will be as follows:

4.28.331.1 Left side: 3.00" high

4.28.331.2 Right side: 3.00" high

4.28.331.3 Front: 2.00" high

4.28.331.4 Rear: 3.00" high

4.28.331.5 The tray will be equipped with slides that are located on the sides of the tray so that the tray can be located as close to the compartment floor as possible. The slides will be equipped with ball bearings for ease of operation and years of dependable service.

4.28.331.6 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.

4.28.332 TOOLBOARD 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. 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. The tool board will be mounted on aluminum tracks to allow for side to side adjustment within the tray. 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). A total of Two (2) tool board(s) will be provided and mounted in the slide-out tray(s) located D4 and P4.

4.28.333 RETENTION WEBBING - Webbing will be provided to retain compartment equipment from laying against the compartment door. The webbing will be located P2. 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. A total of one (1) will be provided.

4.28.334 PARTITION, VERTICAL COMPARTMENT - One (1) partition shall be bolted in D1, 40" from rear door opening. Each partition shall be the full vertical height of the compartment.

4.28.335 LOCKING NUTS - The SCBA and hatch compartment doors will have nuts with star washers and blue Loctite®. Locking nuts will be provided for the following areas:

- 4.28.335.1 DEF tank support mounting bracket-to-body.
- 4.28.335.2 Fuel access door hinges.
- 4.28.335.3 SCBA doors over rear tandem axle.
- 4.28.335.4 Outrigger jack plate storage bracket-to-body.
- 4.28.335.5 Mud flaps-to-wheel wells.
- 4.28.335.6 Engine coolant recovery tank under hood mounting bolts.
- 4.28.335.7 Pump side panel access doors.
- 4.28.335.8 Rear DS compartment and ladder door hinges.
- 4.28.335.9 Stream light Survivor and Box light chargers-to-compartment.
- 4.28.335.10 Relay cover shield for electric components at DS frame rail at transmission.
- 4.28.335.11 Clamp for step light wires at each crew compartment step.
- 4.28.335.12 Aerial device hose box.
- 4.28.335.13 Aerial device mask storage box.
- 4.28.335.14 PS glove box hinge.
- 4.28.335.15 Interior cab ceiling mounted air conditioning filter and pump access door hinge.
- 4.28.335.16 Interior cab access door hinge under rear seat transverse compartment.
- 4.28.335.17 Interior cab access door hinge for engine and transmission oils.
- 4.28.335.18 Exterior cab transverse compartment access door hinges.
- 4.28.335.19 Cab mirrors attachment screws-add locking nuts inside under hood after screws are tightened.
- 4.28.335.20 Angled brackets on each side of the shelves that attach to the shelf and shelf track.
- 4.28.335.21 Rear wall framework around turntable at rear of body.
- 4.28.335.22 All hardware on divider in front body compartment.
- 4.28.335.23 Bell mounting bolts.
- 4.28.335.24 Bolts protruding through the compartment floors or floor tray brackets.

4.28.336 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.

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

4.28.338 HANDRAILS: - Eight (8) handrails, 36.00" long, will be provided mounted between LS1 / LS2; LS2 / LS3; LS3 / LS4; LS4 / LS5 and RS1 / RS2; RS2 / RS3; RS3 / RS4; RS4 / RS5.

4.28.339 SINGLE AIR BOTTLE STORAGE IN FENDER PANEL WITH COMMON DEF FILL DOOR - An air bottle storage compartment will be provided in the body fender panel in the space adjacent to the DEF tank fill in the corner of the fender panel. The compartment will have sufficient capacity for storage of one (1) air bottle. The compartment will have a 7.75" diameter clear opening and will be 26.00" deep. A black rubber matting will be provided inside the compartment. A full width door will be provided to cover the both the storage cylinder and the DEF fill. The full width door will be a single, vertically hinged door that is constructed of stainless steel with a painted finish. The door will have a Southco raised trigger C2 black lever latch. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

4.28.340 DOUBLE WIDE AIR BOTTLE STORAGE IN FENDER PANEL - A double wide air bottle storage compartment will be provided in the corner of the body fender panel. The double wide compartment will have two (2) separate areas for air bottle storage, an upper and a lower storage area. Each storage area will have sufficient capacity for storage of one (1) air bottle. The upper storage area will have a 7.75" diameter clear opening and will be 26.00" deep. The lower storage area will have a 7.75" diameter clear opening. The depth of the lower storage area will be 24.00" deep with a 96.00" wide body and increases to 26.00" deep with a 100.00" body. A black rubber matting and strap to contain the air bottles will be provided inside each compartment. A full width door will be provided to cover the openings of both storage areas. The full width door will be a single vertically hinged door that is constructed of stainless steel with a painted finish. The door will have a Southco raised trigger C2 black lever latch. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. There will be a total of one (1) double wide storage compartment(s) provided. The compartment(s) will be located on the right side forward of the rear wheels.

- 4.28.341 SINGLE AIR BOTTLE STORAGE IN FENDER PANELS W/COMMON DUAL FUEL FILL DOORS -** There will be one (1) air bottle storage compartment provided next to each fuel fill inlet in the fender panels on the left and right hand sides of the body. Each compartment will have sufficient capacity for storage of one (1) air bottle. Each compartment will have a 7.75" diameter clear opening and will be 26.00" deep. A black rubber matting will be provided inside each compartment. A full width door will be provided on each side of the body to cover the both the storage cylinder and the fuel fill. The full width door will be a single, vertically hinged door that is constructed of stainless steel with a painted finish. The door will have a Southco raised trigger C2 black lever latch. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.
- 4.28.342 LADDER/EQUIPMENT STORAGE -** The apparatus will be equipped with a ladder/long equipment storage rack constructed of three (3) storage troughs. The troughs will be accessible from the rear compartment of the body. The storage trough(s) will be arranged allowing equipment to be removed independently without the removal of adjacent equipment.
- 4.28.342.1** The storage troughs will be configured very similar to previous job, 22766. Except the ladders are removed and an additional adjustable slide out tray added. The storage trough(s) will be mounted minimizing the forward compartment area required to accommodate the configuration.
- 4.28.342.2** To prevent side compartment equipment from interfering with the removal of equipment stored in the trough(s), covers will be provided over trough(s) which extend into the forward side compartments. The covers will be finished to match the body compartment interior.
- 4.28.342.3** The storage configuration will be provided with a pair of vertically hinged aluminum treadplate doors with lift and turn pawl latches to secure and prevent equipment from migrating to the rear of the apparatus while in motion.
- 4.28.343 BELL -** A chrome plated, 12.00" bronze cast bell, complete with an eagle, will be mounted on the passenger's side of the front bumper extension. A rope pull, for the bell, will be installed inside the cab.
- 4.28.344 WHEEL GUARD -** A removable wheel guard will be supplied at the both sides. This wheel guard will be removable with a gloved hand. Each wheel guard surface will have a Morton Cass insert to provide a non-skid surface. Two (2) will be supplied. An 8.00" deep bright aluminum treadplate step will be provided at the rear of the body above the rear compartment. The step will be sized to accommodate the mounting of a recessed traffic directing light. The step will be above rear door below walkway.
- 4.28.345 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. **The air horns will be located on each side of the bumper, towards the outside.**
- 4.28.346 AIR HORN CONTROL -** The air horns will be actuated by a chrome push button located on the officer's side of the engine tunnel 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.
- 4.28.347 ELECTRONIC SIREN -** A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided. This siren shall 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.
- 4.28.348 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.
- 4.28.349 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.

4.28.350 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 mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

4.28.351 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.

4.28.352 FRONT ZONE UPPER WARNING LIGHTS - There will be (1) traffic light controller and (12) Whelen flashing LED warning lights with chrome trim mounted on a box with removable cover on the cab roof. The lights will be configured per the following:

- 4.28.352.1** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the driver's side end position.
- 4.28.352.2** One (1) Model M6J with blue to the rear and red forward flashing LEDs in the driver's side front corner position. The corner position will be at a 45-degree angle to the front of the cab.
- 4.28.352.3** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the driver's side first front position.
- 4.28.352.4** One (1) Model 6RBB with blue flashing in a semi circle pattern LEDs in the driver's side second front position.
- 4.28.352.5** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the driver's side third front position.
- 4.28.352.6** One (1) Model M6D with red/white flashing LEDs in the driver's side fourth front position.
- 4.28.352.7** One (1) 792* Strobe traffic light controller set to national standard high priority in the center position.
- 4.28.352.8** One (1) Model M6D with red/white flashing LEDs in the passenger's side fourth front position.
- 4.28.352.9** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the passenger's side third front position.
- 4.28.352.10** One (1) Model 6RBB with blue flashing in a semi circle pattern LEDs in the passenger's side second front position.
- 4.28.352.11** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the passenger's side first front position.
- 4.28.352.12** One (1) Model M6J with blue to the rear and red forward flashing LEDs in the passenger's side front corner position. The corner position will be at a 45-degree angle to the front of the cab.
- 4.28.352.13** One (1) Model 6RBR with red flashing in a semi circle pattern LEDs in the passenger's side end position.
- 4.28.352.14** The color of the lenses will be clear.
- 4.28.352.15** There will be a switch in the cab on the switch panel to control the flashing LEDs.
- 4.28.352.16** The traffic light controller will be activated by a cab switch with emergency master control.
- 4.28.352.17** There will be no momentary switch to activate the traffic light controller.
- 4.28.352.18** The white LEDs will be disabled when the parking brake is applied.
- 4.28.352.19** The flashing LEDs in the front corner, second, third and fifth positions may be load managed when the parking brake is applied.

4.28.353 CAB FACE WARNING LIGHTS - There will be two (2) Whelen, Model 6RB*C, LED flashing warning lights with chrome flange provided on the front of the cab above the headlights. The driver's side front warning light shall be red. The passenger's side front warning light shall be red. Both lights will include a clear lens. There will be a switch located in the cab on the switch panel to control the lights.

4.28.354 FRONT WARNING LIGHT - There will be two (2) Whelen, Model 6RB*, LED flashing light(s) with chrome trim provided below the headlights as shown on the drawing. The color of the light(s) will be red. The color of the lens will be clear. The light(s) will be activated with the front warning switch. These lights may be load managed if colored or disabled if white when the parking brake is applied. Any white light will be disabled and any amber light activated when the parking brake is applied.

4.28.355 SIDE ZONE LOWER LIGHTING - There will be six (6) Whelen®, Model RB6*C, LED flashing warning lights with Model 6EFLANGE, chrome flanges located in the following positions:

- 4.28.356** Two (2) lights, one (1) each side on the bumper extension; side front lights shall be red.
- 4.28.357** Two (2) lights, one (1) each side of cab rearward of crew cab doors; side middle lights shall be blue.
- 4.28.358** Two (2) lights, one (1) each side above rear wheels; side rear lights shall be blue.
- 4.28.359** All six (6) lights will include a clear lens.
- 4.28.360** There will be a switch located in the cab on the switch panel to control the lights.
- 4.28.361** **INTERIOR CAB DOOR WARNING LIGHTS** - There will be four (4) Weldon, Model 8401-0000-20, amber 12-volt DC LED flashing strip lights provided.
- 4.28.362** One (1) light on the driver's side cab door over the window.
- 4.28.363** One (1) light on the passenger's side cab door over the window.
- 4.28.364** One (1) light on the passenger's side crew cab door over the window.
- 4.28.365** One (1) light on the driver's side crew cab door over the window.
- 4.28.366** Each light will be activated when the battery switch is on and the adjacent door is opened.
- 4.28.367** Each light will be installed so the flash pattern directs traffic away from the doors.
- 4.28.368** **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.
- 4.28.369** The side front lights shall be red.
- 4.28.370** The side middle lights shall be blue.
- 4.28.371** The side rear lights shall be red.
- 4.28.372** The color of the lenses will be clear.
- 4.28.373** 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.
- 4.28.374** There will be a switch in the cab on the switch panel to control the lights.
- 4.28.375** White LED's will be disabled when the parking brake is applied. Colored LED's may be load managed when the parking brake is applied.
- 4.28.376** **SIDE WARNING LIGHTS** - There will be two (2) Whelen, Model M9*C LED flashing warning light(s) with bezel(s) provided front corner of the body to match the rear. The color of the lights will be red. All of these lights will include a clear lens. These lights will be activated with the Side Zone Lower warning lights.
- 4.28.377** **SIDE WARNING LIGHTS** - There will be two (2) Whelen, Model WIONSMC* LED light(s) provided and located centered below D1/P1 in the rub rail. The color of each light will be red 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.
- 4.28.378** **SIDE WARNING LIGHTS** - There will be two (2) Whelen, Model WIONSMC* LED light(s) provided and located centered below D4 / P4, in the rub rail. 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.

4.28.379 REAR ZONE LOWER LIGHTING - There shall be two (2) Whelen®, Model 6RB*C, LED flashing warning lights located at the rear of the apparatus.

- 4.28.379.1 The driver's side rear light shall be red
- 4.28.379.2 The passenger's side rear light shall be red
- 4.28.379.3 Both lights will include a lens that is clear.
- 4.28.379.4 There will be a switch located in the cab on the switch panel to control the lights.

4.28.380 WARNING LIGHTS (REAR AND SIDE UPPER ZONES)

- 4.28.380.1 Four (4) Whelen, model M9*C LED flashing warning lights will be provided at the rear of the apparatus.
- 4.28.380.2 The side rear upper light(s) on the driver's side shall be red.
- 4.28.380.3 The rear upper light(s) on the driver's side shall be red.
- 4.28.380.4 The rear upper light(s) on the passenger's side shall be red.
- 4.28.380.5 The side rear upper light(s) on the passenger's side shall be red.
- 4.28.380.6 These lights will include a lens that is clear.
- 4.28.380.7 There will be a switch located in the cab on the switch panel to control the lights.

4.28.381 TRAFFIC DIRECTING LIGHT

- 4.28.381.1 There will be one (1) Power Arc P14PSKR-7Y LED w/Cnt, Batt D, W/In Srv Sw, 46.82" long x 2.84" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.
- 4.28.381.2 The PowerArc control head will be included with this installation.
- 4.28.381.3 The light will be powered up at all times and disabled with the cab in service switch.
- 4.28.381.4 The auxiliary flash not activated.
- 4.28.381.5 This traffic directing light will be recessed within a treadplate step at the rear of the apparatus.
- 4.28.381.6 The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the passenger's side.

4.28.382 ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT - The following guidelines will apply to the 120/240 VAC system installation:

- 4.28.382.1 **General** - Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles. 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). 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.
- 4.28.382.2 **Grounding** - 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. An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. 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.
 - 4.28.382.2.1 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.
 - 4.28.382.2.2 All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

- 4.28.382.3 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. 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. 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 following information:
- 4.28.382.3.1** Rated voltage(s) and type (ac or dc)
 - 4.28.382.3.2** Phase
 - 4.28.382.3.3** Rated frequency
 - 4.28.382.3.4** Rated amperage
 - 4.28.382.3.5** Continuous rated watts
 - 4.28.382.3.6** Power source engine speed
 - 4.28.382.3.7** Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.
- 4.28.382.4 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.
- 4.28.382.4.1** 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).
 - 4.28.382.4.2** 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).
- 4.28.382.5 Wiring Methods** - Fixed wiring systems will be limited to the following:
- 4.28.382.5.1** Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius); OR Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)
 - 4.28.382.5.2** 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.
 - 4.28.382.5.3** Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
 - 4.28.382.5.4** Separated from fuel lines by a minimum of 6.00" (152 mm) distance
 - 4.28.382.5.5** 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.
- 4.28.382.6 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.

- 4.28.382.7 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. 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. 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.
- 4.28.382.8 Dry Locations** - 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. 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.
- 4.28.382.9 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.
- 4.28.383 GENERATOR** - The apparatus will be equipped with a complete electrical power system. The generator will be a Harrison Model 30.0 MPC 30.0 kW Hydraulic unit; no exceptions. The wiring and generator installation will conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation will be designed for continuous operation without overheating and undue stress on components.
- 4.28.383.1** The output of the generator will be controlled by an internal hydraulic system. An electrical instrument gauge panel will be provided for the operator to monitor and control all electrical operations and output.
- 4.28.383.2** The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor.
- 4.28.383.3** The generator will include an electrical control inside the cab. The hydraulic engagement supply will be operational at any time (no interlocks).
- 4.28.383.4** An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.
- 4.28.383.5 Generator Instruments and Controls** - To properly monitor the generator performance a digital meter panel will be furnished and mounted next to the circuit breaker panel. The meter will indicate the following items:
- Voltage
 - Amperage for both lines
 - Frequency
 - Generator run hours
 - Over current indication
 - Over temperature indication
 - "Power On" indication
 - Two (2) fuse holders with two (2) amp fuses (for indicator light protection)
 - The meter and indicators will be installed near eye level in the compartment. Instruments will be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used will be accurate within +/- two (2) percent.
- 4.28.383.6 Generator Wiring** - The system will be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components will be to the highest industry quality standards available on the domestic market. The equipment will be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components will be the minimum acceptable quality standards for this apparatus:
- 4.28.383.7 Wiring** - All electrical wiring will be fine stranded copper type. The wire will be sized to the load and circuit breaker rating; ten (10) gauge on 30-amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The cable will be run in corner areas and extruded aluminum pathways built into the body for easy access.

- 4.28.383.8 Load Center** - The main load center will be a Cutler Hammer with circuit breakers rated to load demand.
- 4.28.383.9 Circuit Breakers** - Individual breakers will be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.
- 4.28.384 GENERATOR LOCATION** - The generator will be installed inside the recessed area on the roof of the body. Modifications such as additional support structure and/or knockouts in the adjacent body wall(s) will be provided as necessary to support the weight and provide airflow for the generator.
- 4.28.385 GENERATOR START** - There will be a switch provided on the cab instrument panel to engage the generator.
- 4.28.386 CIRCUIT BREAKER PANEL** - The circuit breaker panel will be located high on the right wall of compartment RS5.
- 4.28.387 SPACE FOR SPARE CIRCUIT BREAKER** - The circuit breaker panel will be furnished with four (4) circuit breakers slot(s) as spares for future circuit breakers.
- 4.28.388 DIGITAL METER PANEL INSTALLED ON WIRE COVER, CIRCUIT BRKR BOX** - The generator meter panel will be installed in the RS5 wire cover of the circuit breaker box in place of the standard location. The digital meter panel will be on anytime the generator is running (no green indicator light is required).
- 4.28.389 LIGHT TOWER** - There will be one (1) Command Light Knight, Model KL415A-FS, light tower provided on the apparatus. There will be six (6) Fire Research Model K20, 20,000 lumens 120-volt AC LED light heads included on this tower. The color of the tower shall be gray with black lamps. This tower will include the back light option. This tower will not include a strobe light. This tower will activate the Do Not Move Truck Indicator light in the cab if not in the stowed position when the parking brake is released.
- 4.28.390 LIGHT TOWER LOCATION** - The light tower will be installed on the roof of the rescue body. The exact location on the roof will be passenger side of the forward recessed area.
- 4.28.391 LIGHT TOWER CONTROLLER** - There will be a handheld wired controller included with the light tower.
- 4.28.392 LOCATION FOR THE LIGHT TOWER CONTROLLER** - The light tower controller will be installed in the passenger's side front body compartment.
- 4.28.393 ELECTRIC CORD REEL** - Furnished with the 120-volt AC electrical system will be an Akron ERWC-10-16 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 inches above the operators standing position. The reel will be capable holding 12/3 600 volt cable or 10/3 600 volt cable. The reel will include the following features:
- 4.28.393.1** Heavy-duty construction for durability
 - 4.28.393.2** All stainless-steel hardware
 - 4.28.393.3** Rolled disc edges
 - 4.28.393.4** Live slip ring design
 - 4.28.393.5** Includes the gang box attached to the commutator.
 - 4.28.393.6** Meets NFPA requirements for reel overage of 10%
 - 4.28.393.7** The exterior finish of the reel(s) will be painted job color matching the body exterior.
 - 4.28.393.8** A Nylatron guide shall 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.
 - 4.28.393.9** 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.
 - 4.28.393.10** A total of two (2) cord reels will be provided in the hatch compartment above D4 and P4, the passenger reel to have straight blade and the driver reel to have Firepower cord.
 - 4.28.393.11** The cord reel should be configured with three (3) conductors.
- 4.28.394 REEL WARRANTY** - The electric reel will come with a five (5) year warranty provided by the reel manufacturer.

4.28.395 CORD - Provided for electric distribution will be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600-volt jacketed SOOW cord. A Hubbell 5-20, 20-amp, 120-volt, straight blade connector body will be installed on the end of the cord.

4.28.396 CORD - Provided for electrical distribution will be 200 feet of Carol Super Vu-Tron II yellow 10/3 electrical cord. The cord will be provided with a Fire Power connector. A total of one (1) will be provided.

4.28.397 PORTABLE JUNCTION BOX - There will be one (1) Akron EJBX electric junction box(es) provided. There will be a cable strain relief and a 1.00' pigtail with black plastic ribbed grip, NEMA 5-20, 20-amp, 120-volt straight blade plug provided for each box. Each box will be provided with the following:

- 4.28.397.1** Four (4) 15/20-amp 120-volt AC duplex straight blade receptacles with flip up covers
- 4.28.397.2** A 120-volt AC light inside the box

4.28.398 COVER FOR REEL - A cover will be provided over the reel(s) located within the hatch compartment(s). The removable cover will be fabricated from aluminum treadplate and/or painted to match the compartment interior. Three (3) cover(s) will be provided and located driver and passenger side.

4.28.399 REEL FEED THROUGH HATCH FLOOR - A captive roller assembly will be provided through the floor of the hatch compartment, into the compartment below, to assist with the pay out of the cord. A flange will be provided around the roller assembly to assist in keeping water from running into the compartment. A ball stop will be provided on the cord to stop the cord at the roller assembly. A total of three (3) will be installed.

4.28.400 120 VOLT RECEPTACLE - There will be two (2), 15/20-amp 120-volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed driver and passenger forward facing cabinets. The NEMA configuration for the receptacle(s) will be 5-20R. The receptacle(s) will be powered from the shoreline inlet. There will be a label installed near the receptacle(s) that state the following:

- 4.28.400.1** Line Voltage
- 4.28.400.2** Current Rating (amps)
- 4.28.400.3** Phase
- 4.28.400.4** Frequency
- 4.28.400.5** Power Source

4.28.401 120 VOLT RECEPTACLE - There will be four (4), 15/20-amp 120-volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed one in each D4, D3, P3, P4 near the 12-volt connections. The NEMA configuration for the receptacle(s) will be 5-20R. The receptacle(s) will be powered from the shoreline inlet. There will be a label installed near the receptacle(s) that state the following:

- 4.28.401.1** Line Voltage
- 4.28.401.2** Current Rating (amps)
- 4.28.401.3** Phase
- 4.28.401.4** Frequency
- 4.28.401.5** Power Source

4.28.402 TOOL AIR COMPRESSOR - A compressor will be provided for use as an air supply for air tools. The compressor will be an Atlas-Copco Model LE-3-PP. The compressor will be powered by 240 volts AC and will deliver 10.8 CFM at 100 psi. The compressor will have a direct drive with a cooling fan and shroud at the end of the compressor block to draw air efficiently over the cylinders. The compressor will be mounted in the recessed area on the roof of the body with a cover over the compressor. This unit will have the following features:

- 4.28.402.1** 3-HP Direct Drive Compressor
- 4.28.402.2** Coupling Guard
- 4.28.402.3** 1800 RPM Motor
- 4.28.402.4** TEFC Motor (Total Enclosed Fan Cooling)

- 4.28.402.5 Oil Sight Glass
- 4.28.402.6 Oil Drain Tube and Plug
- 4.28.402.7 Inlet Filter
- 4.28.402.8 Pressure Switch/Starter
- 4.28.402.9 Check Valve/unloader
- 4.28.402.10 Maximum Operating Pressure of 145 psig
- 4.28.402.11 Weight 150 lb
- 4.28.402.12 The dimensions of the compressor will be 27.00" long x 21.00" wide x 19.90" high.
- 4.28.402.13 A remote mount control box will be provided with the compressor. The dimensions of the control box will be 12.00" high x 12.00" wide x 6.00" deep. The control box will be located in passenger side compartment P4.

4.28.403 AIR TANK - An air tank with 1454 cubic inch displacement will be provided for storage of air from the tool air compressor. This tank will be plumbed from the compressor. This tank will be supplied with an automatic dump solenoid.

4.28.404 COMPRESSOR COVER - The compressor will be totally enclosed with a cover constructed of .125" bright aluminum treadplate. The cover will be provided with louvers or knockouts as required to provide adequate ventilation for the compressor. An access door will be provided for maintenance or operation of the compressor.

4.28.405 AIR OUTLET - An air outlet will be installed with a female coupling. The air to the outlet will be plumbed from the tool air compressor tank. A mating male fitting will be provided with the loose equipment. There will be a total of two (2) air outlet(s) will be provided inside D5 and P5.

4.28.406 AIR REEL FOR TOOLS - A reel will be provided for air tool operation. The reel system will be piped from the auxiliary on board air compressor. Plumbing to the reel will be accomplished with as few air restrictions as possible. Each reel will have a minimum of 200 feet of .38", inside dimension, Goodyear "Insta-Grip", heavy-duty, blue, #9273 hose installed on it. The reel will be equipped with a 12-volt electric rewind motor operated by a push button rewind switch. The switch will be guarded to prevent accidental operation and installed at a height not to exceed 72 inches above the operators standing position.

- 4.28.406.1 The exterior finish of the reel(s) will be painted job color matching the body exterior.
- 4.28.406.2 A Nylatron guide shall be provided to aid in the payout and loading of the reel. A ball stop will be provided on the end of the hose to prevent the hose end from being wound around the reel.
- 4.28.406.3 A label will be provided in a readily visible location adjacent to the reel. The label will indicate whether the supply is for breathing or utility air, the operating pressure, total hose length and hose size (inside dimension).
- 4.28.406.4 A total of one (1) reel will be located hatch above P5 (to shall be determined at the pre-construction meeting).

4.28.407 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 shall be provided.

4.28.408 NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT - The following loose equipment as outlined in NFPA 1901, 2016 edition, section 10.9.3 will be provided by the fire department. One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than two (2), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer. One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s). One (1) first aid kit. One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High Visibility Public Safety Vests, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front. - Five (5) fluorescent orange traffic cones not less than 28" (711 mm) in height, each equipped with a 6". (152 mm) retro-reflective white band no more than 4" (102 mm) from the top of the cone, and an additional 4" (102 mm) retro-reflective white band 2" (51 mm) below the 6" (152 mm) band. - Five (5) illuminated warning devices such as highway flares, unless the five fluorescent orange traffic cones have illuminating capabilities. - One automatic external defibrillator (AED).

- 4.28.409 DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT** - NFPA 1901, 2016 edition, section 10.9.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.
- 4.28.410 WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT** - The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher. This shall comply with NFPA 1901, 2016 edition, section 10.9.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.
- 4.28.411 PAINT - BODY PAINTED TO MATCH CAB** - The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:
- 4.28.411.1** 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.
 - 4.28.411.2** 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.
 - 4.28.411.3** 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.
 - 4.28.411.4** 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.
 - 4.28.411.5** 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.
 - 4.28.411.6** 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.
 - 4.28.411.7** 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.
- 4.28.412** 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.
- 4.28.413** 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.

4.28.414 Pierce Manufacturing paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) 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 Pierce Manufacturing written paint standards will be available upon request.

4.28.415 The cab and body will be two-tone, with the upper section painted 10 along with a shield design on the cab face and lower section of the cab and body painted 90.

4.28.416 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:

- 4.28.416.1** Topcoats and primers will be chrome and lead free.
- 4.28.416.2** 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.
- 4.28.416.3** Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- 4.28.416.4** 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
- 4.28.416.5** Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- 4.28.416.6** Paint wastes are disposed of in an environmentally safe manner.
- 4.28.416.7** Empty metal paint containers will be to recover the metal.
- 4.28.416.8** Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.
- 4.28.416.9** 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.

4.28.417 PAINT CHASSIS FRAME ASSEMBLY - The chassis frame assembly will be finished with primer and gloss paint 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:

- 4.28.417.1** Frame rails
- 4.28.417.2** Frame liners
- 4.28.417.3** Cross members
- 4.28.417.4** Axles
- 4.28.417.5** Suspensions
- 4.28.417.6** Steering gear
- 4.28.417.7** Battery boxes
- 4.28.417.8** Bumper extension weldment
- 4.28.417.9** Frame extensions
- 4.28.417.10** Body mounting angles
- 4.28.417.11** Rear Body support substructure (front and rear)
- 4.28.417.12** Pump house substructure
- 4.28.417.13** Air tanks
- 4.28.417.14** Steel fuel tank
- 4.28.417.15** Castings
- 4.28.417.16** Individual piece parts used in chassis and body assembly
- 4.28.417.17** Components treated with epoxy E-coat protection prior to paint:
- 4.28.417.18** Two (2) C-channel frame rails
- 4.28.417.19** Two (2) frame liners
- 4.28.417.20** The E-coat process will meet the technical properties shown.

- 4.28.418 PAINT, FRONT WHEELS** - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red.
- 4.28.419 PAINT, REAR WHEELS** - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red. The paint break will extend through two (2) roll-up doors located cab side access doors.
- 4.28.420 FUEL TANK LABEL** - The manufacturer's label on the fuel tank will be taped off so that it does not get painted.
- 4.28.421 PAINT, FUEL FILL DOOR** - The stainless-steel fuel fill door will be painted 90 red.
- 4.28.422 COMPARTMENT INTERIOR PAINT** - The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.
- 4.28.423 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.
- 4.28.424 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".
- 4.28.425 REAR CHEVRON STRIPING** - There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the exterior rear wall. Rear compartment doors, entry doors, or walkway areas will not be covered. The colors will be red and fluorescent yellow green diamond grade. Each stripe will be 6.00" in width. 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.
- 4.28.426 CHEVRON STRIPING ON CAB AND CREW CAB DOOR EDGE** - There will be alternating chevron striping located on the inside of each cab and crew cab door edge. The design will be either DOT pattern or standard chevron design. Width will be determined by available space. The striping will consist of the following colors:
- 4.28.426.1** The first color will be red diamond grade
 - 4.28.426.2** The second color will be fluorescent yellow green diamond grade
- 4.28.427 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.
- 4.28.428 DIAMOND GRADE CHEVRON STRIPE ON TURNTABLE ACCESS STEPS** - A fluorescent yellow green diamond grade and red diamond grade stripe will be provided on the front and rear sides of the swing down turn table access steps. eight (8) step(s) will be striped.
- 4.28.429 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.
- 4.28.429.1** The striping will consist of the following colors:
 - 4.28.429.2** The first color will be red diamond grade
 - 4.28.429.3** The second color will be fluorescent yellow green diamond grade
 - 4.28.429.4** The size of the striping will be 4.00".
- 4.28.430 CAB STRIPE** - There will be a reflective stripe provided on both sides of the cab in place of the chrome molding.
- 4.28.431 LETTERING** - Twenty-one (21) to forty (40) reflective lettering, 3.00" high, with outline will be provided.
- 4.28.432 LETTERING** - There will be reflective lettering, 14.00" high, with outline provided. There will be 24 letters provided.

- 4.28.433 LETTERING** - There will be reflective lettering, 2.00" high, with outline provided. There will be 18 letters provided.
- 4.28.434 LETTERING** - There will be reflective lettering, 4.00" high, with outline provided. There will be four (4) letters provided.
- 4.28.435 LETTERING** - Forty-one (41) to sixty (60) genuine gold leaf lettering, 1.00" high, with outline and shade will be provided.
- 4.28.436 LETTERING** - There will be white reflective lettering, with outline provided. The waving American flag will be provided as a background for the reflective lettering.
- 4.28.437 LETTERING** - Sixty-one (61) to eighty (80) genuine gold leaf lettering, 1.00" high, with outline and shade will be provided.
- 4.28.438 LETTERING** - There will be reflective lettering, 5.00" high, with outline provided. There will be four (4) letters provided.
- 4.28.439 LETTERING** - There will be reflective lettering, 6.00" high, with outline provided. There will be six (6) letters provided.
- 4.28.440 LETTERING** - Eighty-one (81) to one hundred (100) genuine gold leaf lettering, 1.00" high, with outline and shade will be provided.
- 4.28.441 EMBLEM RIBBON STYLE** - There will be one (1) pair of "ISO CLASS 1" Reflective emblem(s) installed.
- 4.28.442 EMBLEM** - There will be a pair of Texas flag emblem/s, installed upper crew cab doors. The flag will be waving design and made out of Gerber Vision material. There will be one (1) reflective emblem(s), approximately 16.00" - 18.00" in size, installed rear door. the emblem will be modeled after the department submitted information (art, patch, etc.).

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. This contract shall terminate upon completion of all work described herein or delivery of all goods ordered, as applicable.

Liquidated Damages for Delay:

The parties agree that the actual damages that might be sustained by the City by reason of the breach by Vendor of its covenant to make delivery within the time specified herein, is uncertain and would be difficult of ascertainment, and **that the sum of \$100.00 per day per unit for each day that delivery is late would be a reasonable compensation for** such breach. Vendor hereby promises to pay, and City hereby agrees to accept, such sum as liquidated damages, and not as a penalty, in the event of such breach. Furthermore, the parties agree that City may withhold said liquidated damages from any payments due to Vendor hereunder. If Vendor's delay exceeds 30 days, City may, at its option, elect to terminate this contract in whole or in part. In such event, City may pursue actual damages, rather than applying this liquidated damages provision.

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 (HGAC).**

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.

Force Majeure.

Should performance of any obligation created under this Agreement become illegal or impossible by reason of fire, flood, storm, epidemic, pandemic, or other national or regional emergency, act of God, governmental authority, or the common enemy, or the result of war, riot, civil commotion, sovereign conduct, or any other cause not enumerated herein but which is beyond the reasonable control of the Party whose performance is affected, then the Liquidated Damages provision is suspended during the period of, and only to the extent of, such prevention or hindrance, provided the affected Party provides reasonable notice of the event of force majeure and exercises all reasonable diligence to remove the cause of force majeure.

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.

ANY TERM OR CONDITION 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.

Prior to the commencement of any work under this Agreement, Vendor shall furnish copies of all required endorsements and completed Certificate(s) of Insurance to the City’s Finance Department - Purchasing Division, which shall be clearly labeled **“PIERCE VELOCITY HEAVY RESCUE TRUCK”** in the Description of Operations block of the Certificate. The Certificate(s) shall be completed by an agent and signed by a person authorized by that insurer to bind coverage on its behalf. City will not accept a Memorandum of Insurance or Binder as proof of insurance. The certificate(s) must have the agent’s signature and phone number, and be mailed, with copies of all applicable endorsements, directly from the insurer’s authorized representative to City. 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 - Purchasing Division. No officer or employee, other than City’s Risk Manager, shall have authority to waive this requirement.

City reserves the right to review the insurance requirements of this Article during the effective period of this Agreement and any extension or renewal hereof and to modify insurance coverages and their limits when deemed necessary and prudent by City’s Risk Manager based upon changes in statutory law, court decisions, or circumstances surrounding this Agreement. In no instance will City allow modification whereby City may incur increased risk.

A Vendor’s financial integrity is of interest to City; therefore, subject to Vendor’s right to maintain reasonable deductibles in such amounts as are approved by City, Vendor shall obtain and maintain in full force and effect for the duration of this Agreement, and any extension here of, at Vendor’s sole expense, insurance coverage written on an occurrence basis, unless otherwise indicated, by companies authorized 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:

TYPE	AMOUNTS
1. Workers' Compensation	Statutory
2. Employers' Liability	\$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. 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

Vendor agrees to require, by written contract, that all subcontractors providing goods or services hereunder obtain the same insurance coverages required of Vendor herein, and provide a certificate of insurance and endorsement that names Vendor and City as additional insureds. Vendor shall provide City with said certificate and endorsement prior to the commencement of any work by the subcontractor. This provision may be modified by City’s Risk Manager, without subsequent City Council approval, when deemed necessary and prudent, based upon changes in statutory law, court decisions, or circumstances surrounding this agreement. Such modification may be enacted by letter signed by City’s Risk Manager, which shall become a part of the contract for all purposes.

As they apply to the limits required by City, City shall be entitled, upon request and without expense, to receive copies of the policies, declaration page, and all endorsements thereto and may require the deletion, revision, or modification of particular policy terms, conditions, limitations, or exclusions (except where policy provisions are established by law or regulation binding upon either of the parties hereto or the underwriter of any such policies). Vendor shall be required to comply with any such requests and shall submit a copy of the replacement certificate of insurance to City at the address provided below within 10 days of the requested change. Vendor shall pay any costs incurred resulting from said changes.

City of San Antonio
Attn: Finance Department-Purchasing Division
P.O. Box 839966
San Antonio, Texas 78283-3966

Vendor agrees that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following provisions:

Name City, 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, with the exception of the workers' compensation and professional liability policies;

Provide for an endorsement that the "other insurance" clause shall not apply to the City of San Antonio where City is an additional insured shown on the policy;

Workers' compensation, employers' liability, general liability and automobile liability policies will provide a waiver of subrogation in favor of City; and

Provide advance written notice directly to City of any suspension, cancellation, non-renewal or material change in coverage, and not less than ten (10) calendar days advance notice for nonpayment of premium.

Within five (5) calendar days of a suspension, cancellation 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 contract. 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 herein required, City shall have the right to order Vendor to stop work hereunder, and/ or withhold any payment(s) which become due to Vendor hereunder until Vendor demonstrates compliance with the requirements hereof.

Nothing herein contained shall be construed as limiting in any way the extent to which Vendor may be held responsible for payment of damages to persons or property resulting from Vendor's or its subcontractors' performance of the work covered under this Agreement.

It is agreed that 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.

It is understood and agreed that the insurance required is in addition to and separate from any other obligation contained in this Agreement and that no claim or action by or on behalf of City shall be limited to insurance coverage provided.

Vendor and any subcontractors are responsible for all damage to their own equipment and/or property.

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 – Local Preference Program Identification Form

Attachment C – Veteran-Owned Small Business Program Tracking Form

006 - GENERAL TERMS & CONDITIONS

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 Finance 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, it s 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.: 6100014567



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, 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 – ATTACHMENT A – PRICE SCHEDULE

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	1	Pierce Velocity Heavy Rescue Truck

PRICE EACH: \$ 1,289,726.00

TOTAL: \$ 1,289,726.00

TRADE-IN 2010 PIERCE QUANTUM – UNIT #8915; TOTAL TRADE-IN PRICE: \$ 35,000

YEAR, MAKE & MODEL OFFERED: 2022 Pierce Velocity HDR

SPECIFIC MAKE & MODEL OF ENGINE OFFERED (INCLUDE SAE NET HP):
Paccar MX13 510HP

WARRANTY:
1 Year

AUTHORIZED WARRANTY SERVICE PROVIDER FACILITY NAME & ADDRESS:
Siddons-Martin Emergency Group - Kirby Service Center
5511 Binz-Engleman Rd Kirby TX 78219

PRODUCTION CUT-OFF DATE: N/A

INDICATE THE LAST DAY THAT THE CITY CAN PLACE ORDERS UNDER THIS CONTRACT WITHOUT MISSING THE PRODUCTION CUT OFF DATE: December 30, 2021

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? No.

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
2	1	Cooperative Fee

PRICE EACH: \$ 2000.00

TOTAL: \$ 2000.00

Prompt Payment Discount: _____% _____ days. (If no discount is offered, Net 30 will apply.)