CITY OF HOUSTON, TEXAS

NOTICE OF REQUEST FOR PROPOSAL (RFP)
SOLICITATION NO.: S58-T25507

U.S. COMMUNITIES
GOVERNMENT PURCHASING ALLIANCE

This solicitation is being issued by the City of Houston, Texas (Lead Public Agency) for and on behalf of other governmental agencies and the resulting contract(s) will be made available through the U.S. Communities Government Purchasing Alliance.

Date Issued:	Friday- August 21, 2015
Pre-Proposal Conference:	Wednesday, September 9, 2015@ 10:00A.M. Strategic Procurement Division 901 Bagby, Conference Room 2 Houston, TX 77002
Pre-Proposal Questions Deadline:	Friday, September 11, 2015@ 5:00 P.M.
Solicitation Due Date:	Wednesday, October 7, 2015 @ 3:00 P.M., CST
Solicitation Contact Person:	Ketan Shah ketan.shah@houstontx.gov 832-393-8714

Project Summary: 3-year contract for Emergency and Specialty Vehicles, Equipment and Accessories and any Related Equipment, Supplies and Services.

Project Description: This RFP is for the provision of all Emergency and Specialty Vehicles, Equipment and Accessories and any Related Equipment, Supplies and Services.

Bidding forms, specifications, and all necessary information should be downloaded from the Internet at http://purchasing.houstontx.gov by registering and downloading this solicitation document, all updates to this solicitation document will be automatically forwarded via e-mail to all registered bidders.

NIGP Code: [071-03, 071-77, 340-36,340-62,]
[450-52, 450-49, 450-51, 072-30, 998-42]

MWBE Goal: Waive

Lourdes Coss, Chief Procurement Officer

August 18, 2015

Date

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PART I – GENERAL INFORMATION

A. General Information

The City of Houston ("City") wishes to Contract for Emergency and Specialty Vehicles, Equipment and Accessories and any Related Equipment, Supplies and Services.

City of Houston Background

The City of Houston is the fourth largest City in the United States comprising 23 departments with multiple locations throughout the City. The City has approximately 23,000 employees with approximately 500 employees involved in the procurement and/or contracting process. Contracts where the City must pay in excess of $50,000 are routed to City Council for approval. The annual volume of contracts and purchase orders issued in the City in the last five years has ranged from 19,000 to 23,000.

As a point of reference, prospective proposers may refer to the City's Procurement Manual and corresponding Purchasing Manual (currently under revision) for current processes. The manuals can be accessed at http://purchasing.houstontx.gov/docs/SPD%20Procurement%20Manual.pdf and http://purchasing.houstontx.gov/docs/Procurement_Manual.pdf. The City is looking for additional opportunities to streamline its processes through the implementation of technology.

B. Solicitation Schedule

Listed below are the important dates for this Request for Proposal (RFP).

EVENT	DATE
Date of RFP Issued	August 21, 2015
Pre-Proposal Conference	September 9, 2015 @ 10:00AM
Questions from Proposers Due to City	September 11, 2015
Proposals Due from Proposers	October 7, 2015 by 3:00PM
Notification of Intent to Award (*Estimated*)	March 2, 2016
Council Agenda Date (Estimated)	April 20, 2016

C. City of Houston intent to procure estimated quantity per year for Ambulance – 05, Engine – 05, Aerial Ladder – 03, Aerial Tower – 01. All other products listed in this RFP, City intent to procure as and when require basis.

The City reserves the option, after bids are opened, to adjust the quantities on the item(s) listed on the following page(s) upward or downward, subject to the availability of funds, and/or make award(s) on a line item basis.

PART II – SCOPE OF WORK/TECHNICAL SPECIFICATIONS

A. OVERVIEW:

1. MASTER AGREEMENT

City of Houston (herein "Lead Public Agency") on behalf of itself and all states, local governments, school districts, and higher education institutions in the United States of America, and other government agencies and nonprofit organizations (herein "Participating Public Agencies") is soliciting proposals from qualified suppliers to enter into a Master Agreement for a complete line of Emergency and Specialty Vehicles, Equipment and Accessories and any Related Equipment, Supplies and Services (herein "Products and Services").

2. OBJECTIVES

A. Provide a comprehensive competitively solicited Master Agreement offering Products and Services to Participating Public Agencies;

B. Establish the Master Agreement as a Supplier's primary offering to Participating Public Agencies;

C. Achieve cost savings for Suppliers and Participating Public Agencies through a single competitive solicitation process that eliminates the need for multiple bids or proposals;

D. Combine the volumes of Participating Public Agencies to achieve cost effective pricing;

E. Reduce the administrative and overhead costs of Suppliers and Participating Public Agencies through state of the art ordering and delivery systems;

F. Provide Participating Public Agencies with environmentally responsible products and services.

3. GENERAL DEFINITION OF PRODUCTS AND/OR SERVICES

Proposers are to propose the broadest possible selection of EMERGENCY AND SPECIALTY VEHICLES, EQUIPMENT AND ACCESSORIES AND ANY RELATED SUPPLIES AND SERVICES they offer. The intent of this solicitation is to provide Participating Public Agencies with products and services to meet their various needs and intends to award a contract by category. Therefore, the Proposers should have demonstrated experience in providing the Products and Services as defined in the RFP, including but not limited to:

CATEGORY A – **Ambulance and Emergency Vehicles, Equipment and Accessories** – A complete line of EMS vehicles, equipment and accessories, including Type I and Type III EMS Modules, Type II vehicles if offered, mobile clinics, and any other ambulance vehicles, equipment and accessories available from Proposer.

CATEGORY B – **Fire Apparatus Vehicles, Equipment and Accessories –** A complete line of Fire Apparatus, equipment and accessories available from Proposer.

CATEGORY C – **Specialty Vehicles, Equipment and Accessories** – A complete line of Specialty vehicles, including mobile command centers, hazmat vehicles, bomb response units, SWAT vehicles, crime scene vehicles, prisoner transport, mobile classrooms, mobile medical units, mobile dental units, mammography units, bloodmobiles, mobile audiology units, mobile ophthalmology units, mobile veterinary units, mobile laboratory units, book mobiles, and any other specialty vehicles, equipment and accessories available from Proposer.

CATEGORY D – **Related Supplies and Services** – Any related supplies and services available from supplier, including but not limited to, parts, training, vehicle services, and any other related supplies and services available from Proposer.

ALL PRODUCTS OFFERED MUST BE NEW, UNUSED, LATEST DESIGN AND TECHNOLOGY UNLESS OTHERWISE SPECIFIED.

4. REQUIREMENTS

4.1. Experience:

4.1.1. Proposer must be licensed in the State of Texas per the Texas Motor Vehicle Commission Code, Section 2301.251 and shall provide a copy of its license.

4.1.2. Proposer must have factory authorized distributors/dealers located in Texas and shall provide a listing of those distributors/dealers, including company name, address, phone, email and contact person for each dealer location.

4.1.3. Proposer must provide a designated Account Manager for the City of Houston and a designated National Account Manager, each with at least five (5) years' experience in providing Products and Services.

4.1.4. Proposer must affirm it is in full compliance with all applicable laws and regulations in connection with the Products and Services required under this RFP. Proposer must state how it will ensure continued compliance through the term of the contract.

4.2. Ambulance and Emergency Vehicles, Equipment and Accessories

4.2.1. Proposer must be a manufacturer of the Products with a minimum of ten (10) continuous years' experience building like vehicle types and sizes in the industry and a minimum production output of 100 vehicles per year.

4.2.2. Proposer must provide a list of at least 25 customers currently using ambulance and emergency vehicles manufactured by its company.

4.2.3. Vehicles shall conform to the general specifications in Attachment A. A copy of certification for federal specification standard KKK-A-1822 must be made available upon request.

4.2.4. Proposer shall provide detailed specifications for all vehicles, equipment and accessories.

4.3. Fire Apparatus Vehicles, Equipment and Accessories

4.3.1. For the City of Houston, vehicles shall conform to the City of Houston specifications in Attachments B-1, B-2 and B-3.

4.3.2. Proposer shall provide detailed specifications for all other Fire Apparatus Vehicles, Equipment and Accessories.

4.4. Specialty Vehicles, Equipment and Accessories

4.4.1. Proposer must be a full in-house, turnkey manufacturer of the Products with a minimum of ten (10) continuous years building like vehicle types and sizes in the industry and have a minimum production output of ten (10) vehicles per month.

4.4.2. Vehicles shall conform to the general specifications in Attachment C and Proposer shall provide detailed specifications for all vehicles, equipment and accessories.

5. MULTIPLE AWARD

The City reserves the right to award the contract locally and/or nationally in the aggregate, by Product catagory, multiple award, primary, secondary, and tertiary, whichever is in the best interest of the City and Participating Public Agencies as a result of this solicitation.

6. OEM AND AFTERMARKET COMPONENTS

The Products shall be new and of the latest factory model year released. They shall be complete, and ready to operate upon delivery. No rebuilt or re-manufactured components will be acceptable. All components shall be Original Equipment Manufacturer (OEM), no aftermarket components shall be acceptable unless approved by the designated representative from the City or Participating Public Agency prior to submittal of Products.

All accessory installations shall be securely affixed and comply with OEM and OSHA standards. No installation shall interfere with OEM systems nor render the vehicle warranty invalid.

All electrical installations shall have wiring securely affixed to running path. Wiring shall have protection with a minimum of shielding with loom, rubber grommets for “pass through” and insulated wire clamps for mounting. All accessory circuits shall have proper circuit protection adequate to prohibit damage to vehicle OEM systems and prevent electrical shorts or fires.

7. COMPLIANCE WITH LAWS

The Products shall be at the date of delivery in compliance with all current and applicable federal, state, and local laws pertaining to this equipment. Each proposer may be required to furnish proof of compliance prior to award of this solicitation.

8. SUB-CONTRACTING

Sub-contracting of the design, engineering, finite element analysis (FEA), and manufacturing shall not be permitted.

9. DESIGN

Designs should include the integration of all systems and sub-systems so they are blended together seamlessly with the creative design elements to present the Products positively to the end user.

Designs shall be as such to perform in a commercial duty with an operating lifecycle of ten (10) years. Designs shall be completely designed from the ground up as an emergency or specialty vehicle.

Design drawings shall be submitted to the City or Participating Public Agency per the specifications for approval.

10. DELIVERY

Proposer shall notify designated City or Participating Public Agency personnel fifteen (15) working days prior to delivery of the vehicle so that appropriate staff may complete pre-delivery inspections and complete necessary scheduling arrangements prior to the Product’s delivery.

11. INSPECTION AND ACCEPTANCE

The successful Proposer’s Products shall be subjected to a pre-delivery and post-delivery inspection by the City and Participating Public Agency to determine that the Product, in its final configuration, meet the requirements of this RFP, is complete and not damaged upon delivery to the City or Participating Public Agency.

The vehicle will not be accepted until all manuals are delivered to the City or Participating Public Agency.

Final acceptance shall be made after post-delivery and after inspection demonstrates that the vehicle is operational and in full compliance with this RFP.

12. MANUALS

Proposer shall furnish a complete set of manuals during delivery of vehicle and shall provide, at a minimum, one (1) hard copy of each as well as one (1) electronic copy on thumb drive or CD unless otherwise specified in Attachments A, B-1, B-2, B-3 or C.

13. TRAINING

Proposer shall provide training to operators and technicians of the City and Participating Public Agencies at no additional cost. At a minimum, such training shall include operator training on all machine functions as well as operator preventive maintenance.

14. WARRANTY

Proposer shall provide all applicable warranties as part of this RFP response and describe its ability in business days to provide any required warranty service to a Participating Public Agency. Proposer shall also note any extended warranties available and include pricing for such extended warranties in the Price section of the Proposer's response.

15. EQUIPMENT RECALLS

In the event of any recall notice, technical service bulletin, or other important notification affecting equipment purchased from this contract, a notice shall be sent to appropriate personnel at each Participating Public Agency in a timely manner. Proposer shall describe its process for notification of equipment recalls and timing of such notification.

16. SUBSTITUTION OF SPECIFIED ITEMS

Whenever the Contract Documents refer to any specific article, device, equipment, product, material, fixture, specified patent or proprietary name, patented process, forms, method or type of construction, by name, make, trade name, or catalog number ("specified item"), such reference shall be deemed to be followed by the words, "or approved equal", unless it is indicated that no substitutions will be considered.

Any Proposer who has submitted a Proposal prior to the deadline may submit data to the City to substantiate a request to provide an "or approved equal" item when completing Sample Specification Pricing in Attachment D of this RFP.

17. Local Key Personnel

The Proposer shall identify the local key personnel that will be committed to the project. The City reserves the right to reject any key personnel proposed if it is determined in the City's best interest. All key personnel must be committed to the project at the appropriate time level. Proposer understands that the qualifications and experience of key personnel proposed will be factored into the evaluation process; therefore, key personnel must not be replaced without the approval of the City. Any approved substitutions must be with personnel of equal or better qualifications. In addition, any other commitments must not conflict with the level of commitment proposed for this project.

18. Price

The City will consider the overall pricing for the comprehensive solution in its selection process. Part XI, Price sheet must be submitted in a separate sealed envelope marked "PRICING".

PART III – MINIMUM QUALIFICATIONS

Ambulance: Refer Attachment A for City Of Houston detail Specifications.

Fire Engine (Fire Apparatus): Refer Attachment B-1 for City Of Houston detail Specifications.

Fire Aerial Ladder: Refer Attachment B-2 for City Of Houston detail Specifications.

Fire Aerial Tower: Refer Attachment B-3 for City Of Houston detail Specifications.

Specialty Vehicle: Refer Attachment C for City Of Houston detail Specifications.

PART IV – U.S. COMMUNITIES INFORMATION

A. U.S. Communities Overview

U.S. COMMUNITIES

U.S. Communities Government Purchasing Alliance (herein "U.S. Communities") assists Participating Public Agencies to reduce the cost of purchased goods through strategic sourcing that combines the volumes and the purchasing power of public agencies nationwide. This is accomplished through an award of competitively solicited contracts for high quality products and services by large and well recognized public agencies (herein "Lead Public Agencies"). The contracts provide for use by not only the respective Lead Public Agency, but also by other Participating Public Agencies.

National Sponsors

U.S. Communities is jointly sponsored by the National Institute of Governmental Purchasing (NIGP), the National Association of Counties (NACo), the National League of Cities (NLC), the Association of School Business Officials International (ASBO) and the United States Conference of Mayors (USCM) (herein "National Sponsors").

Advisory Board

The U.S. Communities Advisory Board is made up of key government purchasing officials from across the United States.

Each Advisory Board Member is expected to actively participate in product bids and selection, participate in policy direction, and share expertise and purchasing innovations.

Current U.S. Communities Advisory Board Members

Auburn University, AL
City and County of Denver, CO
City of Chicago, IL
City of Houston, TX
City of Kansas City, MO
City of Los Angeles, CA
City of San Antonio, TX
City of Seattle, WA
Cobb County, GA
Denver Public Schools, CO
Emory University, GA
Fairfax County, VA
Fresno Unified School District, CA
Great Valley School District, PA
Harford County Public Schools, MD
Hennepin County, MN
Los Angeles County, CA
Maricopa County, AZ
Miami-Dade County, FL
Nassau BOCES, NY
North Carolina State University, NC
Ocean City, NJ
Onondaga County, NY
Port of Portland, OR
Prince William County Schools, VA
Salem-Keizer School District, OR
San Diego Unified School District, CA
State of Iowa
The School District of Collier County, FL

Participating Public Agencies

Today more than 55,000 public agencies utilize U.S. Communities contracts and suppliers to procure over $1.8 Billion Dollars in products and services annually. Each month more than 500 new public agencies register to participate. The continuing rapid growth of public agency participation is fueled by the program's proven track record of providing public agencies unparalleled value.

The Supplier(s) must communicate directly with any Participating Public Agency concerning the placement of orders, issuance of the purchase order, contractual disputes, invoicing, and payment.

City of Houston is acting as "Contracting Agent" for the Participating Public Agencies and shall **not** be held liable for any costs, damages, expenses, fees, liabilities, etc. incurred by any other Participating Public Agency.

Each Participating Public Agency enters into a Master Intergovernmental Cooperative Purchasing Agreement (MICPA) outlining the terms and conditions that allow access to the Lead Public Agencies' Master Agreements. Under the terms of the MICPA, the procurement by the Participating Public Agency shall be construed to be in accordance with, and governed by, the laws of the state in which the Participating Public Agency resides. A copy of the MICPA is attached in Part IV, U.S. Communities Information.

Estimated Volume

The estimated dollar volume of Products and Services purchased under the proposed Master Agreement is $100 Million Dollars annually. This estimate is based on the anticipated volume of the Lead Public Agency, the U.S. Communities Advisory Board members, and current sales within the U.S. Communities program. While there is no minimum quantity of products required to be purchased under the proposed Master Agreement, City of Houston and the U.S. Communities Advisory Board Members are committed to utilizing the Master Agreement. The Advisory Board members shall determine if the Master Agreement is of value to their agency, and will promote the Master Agreement among other public agencies nationwide and internationally. The Advisory Board in 2014 purchased more than $168 Million Dollars of products and services from existing U.S. Communities contracts.

Marketing Support

U. S. Communities provides marketing support for each Supplier's products through the following:

- National Sponsors as referenced above.
- State Associations of Counties, Schools and Municipal Leagues.
- Administrative and marketing personnel that directly promote the U.S. Communities Suppliers to Participating Public Agencies through public agency meetings, direct mail, national publications, annual meetings and a network of K-12, City, County, Higher Education and State Associations.

- U.S. Communities provides Suppliers government sales training, and a host of online marketing and sales management tools to effectively increase sales through U.S. Communities.

Marketplace

U.S. Communities has developed an online Marketplace, which gives Participating Public Agencies the ability to purchase from many U.S. Communities contracts directly from our website. The Marketplace makes it easier for Participating Public Agencies to access many contracts through a single login and place orders using a procurement card, credit card or purchase order. Suppliers have the ability to add their products to the Marketplace at no cost.

Multiple Awards

Multiple awards may be issued as a result of the solicitation. Multiple Awards will ensure that any ensuing Master Agreements fulfill current and future requirements of the diverse and large number of Participating Public Agencies.

Evaluation of Proposals

Proposals will be evaluated by the Lead Public Agency in accordance with, and subject to, the relevant statutes, ordinances, rules and regulations that govern its procurement practices.

U.S. Communities Advisory Board members and other Participating Public Agencies will assist the Lead Public Agency in evaluating proposals. The Supplier(s) that respond(s) affirmatively meets the requirements of this Request for Proposal and provides the best overall value will be eligible for a contract award. U.S. Communities reserves the right to make available or not make available Master Agreements awarded by a Lead Public Agency to Participating Public Agencies.

B. U.S. Communities Information

SUPPLIER QUALIFICATIONS
COMMITMENTS

U.S. Communities views the relationship with an awarded Supplier as an opportunity to provide maximum benefit to both the Participating Public Agencies and to the Supplier.

The successful foundation of the partnership requires commitments from both U.S. Communities and the Supplier. U.S. Communities requires the Supplier to make the four commitments set forth below (Corporate, Pricing, Economy, Sales) to ensure that Supplier is providing the highest level of public benefit to Participating Public Agencies:

(a) **Corporate Commitment**.

(i) The pricing, terms and conditions of the Master Agreement shall, at all times, be Supplier's primary contractual offering of Products and Services to Public Agencies. All of Supplier's direct and indirect marketing and sales efforts to Public Agencies shall demonstrate that the Master Agreement is Supplier's primary offering and not just one of Supplier's contract options.

(ii) Supplier's sales force (including inside, direct and/or authorized dealers, distributors and representatives) shall always present the Master Agreement when marketing Products or Services to Public Agencies.

(iii) Supplier shall advise all Public Agencies that are existing customers of Supplier as to the pricing and other value offered through the Master Agreement.

(iv) Upon authorization by a Public Agency, Supplier shall transition such Public Agency to the pricing, terms and conditions of the Master Agreement.

(v) Supplier shall ensure that the U.S. Communities program and the Master Agreement are actively supported by Supplier's senior executive management.

(vi) Supplier shall provide a national/senior management level representative with the authority and responsibility to ensure that the Supplier's Commitments are maintained at all times. Supplier shall also designate a lead referral contact person who shall be responsible for receiving communications from U.S. Communities concerning new Participating Public Agency registrations and for ensuring timely follow-up by Supplier's staff to requests for contact from Participating Public Agencies. Supplier shall also provide the personnel necessary to implement and support a supplier-based internet web page dedicated to Supplier's U.S. Communities program and linked to U.S. Communities' website and shall implement and support such web page.

(vii) Supplier shall demonstrate in its procurement solicitation response and throughout the term of the Master Agreement that national/senior management fully supports the U.S. Communities program and its commitments and requirements. National/Senior management is defined as the executive(s) with companywide authority.

(viii) Where Supplier has an existing contract for Products and Services with a state, Supplier shall notify the state of the Master Agreement and transition the state to the pricing, terms and conditions of the Master Agreement upon the state's request. Regardless of whether the state decides to transition to the Master Agreement, Supplier shall primarily offer the Master Agreement to all Public Agencies located within the state.

(b) **Pricing Commitment**.

(i) Supplier represents to U.S. Communities that the pricing offered under the Master Agreement is the lowest overall available pricing (net to purchaser) on Products and Services that it offers to Public Agencies. Supplier's pricing shall be evaluated on either an overall project basis or the Public Agency's actual usage for more frequently purchased Products and Services.

(ii) Contracts Offering Lower Prices. If a pre-existing contract and/or a Public Agency's unique buying pattern provide one or more Public Agencies a lower price than that offered under the Master Agreement, Supplier shall match that lower pricing under the Master Agreement and inform the eligible Public Agencies that the lower pricing is available under the Master Agreement. If an eligible Public Agency requests to be transitioned to the Master Agreement, Supplier shall do so and report the Public Agency's purchases made under the Master Agreement going forward. The price match only applies to the eligible Public Agencies. Below are three examples of Supplier's obligation to match the pricing under Supplier's contracts offering lower prices.

(A) Supplier holds a state contract with lower pricing that is available to all Public Agencies within the state. Supplier would be required to match the lower state pricing under the Master Agreement and make it available to all Public Agencies within the state.

(B) Supplier holds a regional cooperative contract with lower pricing that is available only to the ten cooperative members. Supplier would be required to match the lower cooperative pricing under the Master Agreement and make it available to the ten cooperative members.

(C) Supplier holds a contract with an individual Public Agency. The Public Agency contract does not contain any cooperative language and therefore other Public Agencies are not eligible to utilize the contract. Supplier would be required to match the lower pricing under the Master Agreement and make it available only to the individual Public Agency.

(iii) Deviating Buying Patterns. Occasionally U.S. Communities and Supplier may interact with a Public Agency that has a buying pattern or terms and conditions that considerably deviate from the normal Public Agency buying pattern and terms and conditions, and causes Supplier's pricing under the Master Agreement to be higher than an alternative contract held by Supplier. This could be created by a unique end-user preference or requirements. In the event that this situation occurs, Supplier may address the issue by lowering the price under the Master Agreement on the item(s) causing the large deviation for that Public Agency. Supplier would not be required to lower the price for other Public Agencies.

(iv) Supplier's Options in Responding to a Third Party Procurement Solicitation. While it is the objective of U.S. Communities to encourage Public Agencies to piggyback on to the Master Agreement rather than issue their own procurement solicitations, U.S. Communities recognizes that for various reasons some Public Agencies will issue their own solicitations. The following options are available to Supplier when responding to a Public Agency solicitation:

(A) Supplier may opt not to respond to the procurement solicitation. Supplier may make the Master Agreement available to the Public Agency as a comparison to its solicitation responses.

(B) Supplier may respond with the pricing, terms and conditions of the Master Agreement. If Supplier is awarded the contract, the sales would be reported as sales under the Master Agreement.

(C) If competitive conditions require pricing lower than the standard Master Agreement pricing, Supplier may submit lower pricing through the Master Agreement. If Supplier is awarded the contract, the sales would be reported as sales under the Master Agreement. Supplier would not be required to extend the lower price to other Public Agencies.

(D) Supplier may respond to the procurement solicitation with pricing that is higher (net to buyer) than the pricing offered under the Master Agreement. If awarded a contract, Supplier shall still be bound by all obligations set forth in the Administration Agreement, including, without limitation, the requirement to continue to advise the awarding Public Agency of the pricing, terms and conditions of the Master Agreement.

(E) Supplier may respond to the procurement solicitation with pricing that is higher (net to buyer) than the pricing offered under the Master Agreement and if an alternative response is permitted, Supplier may offer the pricing under the Master Agreement as an alternative for consideration.

(c) **Economy Commitment**. Supplier shall demonstrate the benefits, including the pricing advantage, of the Master Agreement over alternative options, including competitive solicitation pricing and shall proactively offer the terms and pricing under the Master Agreement to Public Agencies as a more effective alternative to the cost and time associated with such alternate bids and solicitations.

(d) **Sales Commitment**. Supplier shall market the Master Agreement through Supplier's sales force or dealer network that is properly trained, engaged and committed to offering the Master Agreement as Supplier's primary offering to Public Agencies. Supplier's sales force compensation and incentives shall be greater than or equal to the compensation and incentives earned under other contracts to Public Agencies.

(i) Supplier Sales. Supplier shall be responsible for proactive direct sales of Supplier's Products and Services to Public Agencies and the timely follow-up to sales leads identified by U.S. Communities. Use of product catalogs, targeted advertising, direct mail and other sales initiatives are encouraged. All of Supplier's sales materials targeted towards Public Agencies shall include the U.S. Communities logo. U.S. Communities hereby grants to Supplier, during the term of this Agreement, a non-exclusive, revocable, non-transferable, license to use the U.S. Communities name, trademark, and logo solely to perform its obligations under this Agreement, and for no other purpose. Any goodwill, rights, or benefits derived from Supplier's use of the U.S. Communities name, trademark, or logo shall inure to the benefit of U.S. Communities. U.S. Communities shall provide Supplier with its logo and the standards to be employed in the use of the logo. During the term of the Agreement, Supplier grants to U.S. Communities an express license to reproduce and use Supplier's name and logo in connection with the advertising, marketing and promotion of the Master Agreement to Public Agencies. Supplier shall assist U.S. Communities by providing camera-ready logos and by participating in related trade shows and conferences. At a minimum, Supplier's sales initiatives shall communicate that (i) the Master Agreement was competitively solicited by the Lead Public Agency, (ii) the Master Agreement provides the best government pricing, (iii) there is no cost to Participating Public Agencies, and (iv) the Master Agreement is a non-exclusive contract.

(ii) Branding and Logo Compliance. Supplier shall be responsible for complying with the U.S. Communities branding and logo standards and guidelines. Prior to use by Supplier, all U.S. Communities related marketing material must be submitted to U.S. Communities for review and approval.

(iii) Sales Force Training. Supplier shall train its national sales force on the Master Agreement and U.S. Communities program. U.S. Communities shall be available to train regional or district managers and generally assist with the education of sales personnel.

(iv) Participating Public Agency Access. Supplier shall establish the following communication links to facilitate customer access and communication:

(A) A dedicated U.S. Communities internet web-based homepage containing:

(1) U.S. Communities standard logo with Founding Co-Sponsors logos;
(2) Copy of original procurement solicitation;
(3) Copy of Master Agreement including any amendments;
(4) Summary of Products and Services pricing;
(5) Electronic link to U.S. Communities' online registration page; and
(6) Other promotional material as requested by U.S. Communities.

(B) A dedicated toll-free national hotline for inquiries regarding U.S. Communities.

(C) A dedicated email address for general inquiries in the following format: uscommunities@(name of supplier).com.

(v) Electronic Registration. Supplier shall be responsible for ensuring that each Public Agency has completed U.S. Communities' online registration process prior to processing the Public Agency's first sales order.

(vi) Supplier's Performance Review. Upon request by U.S. Communities, Supplier shall participate in a performance review meeting with U.S. Communities to evaluate Supplier's performance of the covenants set forth in this Agreement.

(vii) Supplier Content. Supplier may, from time to time, provide certain graphics, media, and other content to U.S. Communities (collectively "Supplier Content") for use on U.S. Communities websites and for general marketing and publicity purposes. Supplier hereby grants to U.S. Communities and its affiliates a non-exclusive, worldwide, perpetual, free, transferrable, license to reproduce, modify, distribute, publically perform, publically display, and use Supplier Content in connection with U.S. Communities websites and for general marketing and publicity purposes, with the right to sublicense each and every such right. Supplier warrants that: (a) Supplier is the owner of or otherwise has the unrestricted right to grant the rights in and to Supplier Content as contemplated hereunder; and (b) the use of Supplier Content and any other materials or services provided to U.S. Communities as contemplated hereunder will not violate, infringe, or misappropriate the intellectual property rights or other rights of any third party.

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U.S. Communities Administration Agreement Information

The Supplier is required to execute the U.S. Communities Administration Agreement unaltered (attached hereto as a part of Part IV of this RFP) prior to the award of the U.S. Communities contract. The Agreement outlines the Supplier's general duties and responsibilities in implementing the U.S. Communities contract.

The executed U.S. Communities Administration Agreement is required to be submitted with the supplier's proposal without exception or alteration. Failure to do so will result in disqualification.

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SUPPLIER WORKSHEET FOR NATIONAL PROGRAM CONSIDERATION

Suppliers are required to meet specific qualifications. Please respond in the spaces provided after each qualification statement below:

A. State if pricing for all Products/Services offered will be the most competitive pricing offered by your organization to Participating Public Agencies nationally.
   YES____ NO____

B. Does your company have the ability to provide service to any Participating Public Agencies in the contiguous 48 states, and the ability to deliver service in Alaska and Hawaii?
   YES____ NO____

C. Does your company have a national sales force, dealer network or distributor with the ability to call on Participating Public Agencies in at least 35 U.S. states?
   YES____ NO____

D. Did your company have sales greater than $100 million last year in the United States?
   YES____ NO____

E. Does your company have existing capacity to provide electronic and ecommerce ordering and billing?
   YES____ NO____

F. Will your company assign a dedicated Senior Management level Account Manager to support the resulting U.S. Communities program contract?
   YES____ NO____

G. Does your company agree to respond to all agency referrals from U.S. Communities within 2 business days?
   YES____ NO____

H. Does your company maintain records of your overall Participating Public Agencies' sales that you can and will share with U.S. Communities to monitor program implementation progress?
   YES____ NO____

I. Will your company commit to the following program implementation schedule?
   YES____ NO____

J. Will the U.S. Communities program contract be your lead public offering to Participating Public Agencies?
   YES____ NO____

_____

Submitted by:

_____ _____
(Printed Name) *(Signature)*

_____ _____
(Title) *(Date)*

New Supplier Implementation Checklist	Target Completion After Award
1. First Conference Call	**One Week**
Discuss expectations	
Establish initial contact people & roles	
Outline kickoff plan	
Establish WebEx training date	
2. Second Conference Call	**One Week**
Review Contract Commitments	
3. Executed Legal Documents	**One Week**
U.S. Communities Administration Agreement	
Lead Public Agency agreement signed	
4. Supplier Login Established	**One Week**
Complete Supplier Set Up form	
Complete user account & user ID form	
5. Initial Sr. Management Meeting	**Two Weeks**
Implementation Process Progress	
U.S. Communities & Supplier Organizational Overview	
Supplier Manager to review and further discuss commitments	
6. Initial National Account Manager (NAM) & Staff Training Meetings	**Two Weeks**
Discuss expectations, roles & responsibilities	
Introduce and review web-based tools	
Review process & expectations with NAM and lead referral person	
7. Review Top Joint Target Opportunities	**Four Weeks**
Top 10 local contracts	
Review top U.S. Communities Participating Public Agencies (PPA)	
8. Program Contact Requirements	**One Week**
Supplier contacts communicated to U.S. Communities Staff	
Dedicated email	
Dedicated toll free number	
Dedicated fax number	
9. Web Development	
Initiate IT contact	**One Week**
Initiate E-Commerce Conversation	**One Week**
Begin Website construction	**Two Weeks**
Website final edit	**Five Weeks**
Product upload to U.S. Communities site	**Five Weeks**
10. Sales Training & Roll Out	
Program Manager (PM) briefing - Coordinate with NAM	**Five Weeks**
Initial remote WebEx training for all sales - Coordinate with NAM	**Three Weeks**

Establish 90-day face-to-face training plan/strategy session for all sales –with NAM & PM	**Two Weeks**
Top 10 metro areas - Coordinate with NAM & PM	**Four Weeks**
Initiate contact with Advisory Board (AB) members	**Four Weeks**
11. Marketing	**Six Weeks**
General announcement	
1 Page Summary with Supplier contacts	
Branding of program	
Supplier handbook	
Announcement to AB and Sponsors	

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SUPPLIER INFORMATION

Please respond to the following requests for information about your company:

Company

1. Total number and location of sales persons employed by your company in the United States;

   Example:

NUMBER OF SALES REPRESENTATIVES	CITY	STATE
13	Phoenix	AZ
6	Tucson	AZ
10	Los Angeles	CA
12	San Francisco	CA
6	San Diego	CA
5	Sacramento	CA
3	Fresno	CA
	Etc.	Etc.
Total: 366		

2. Number and location of distribution outlets in the United States (if applicable);

3. Number and location of support centers (if applicable);

4. Annual sales for 2012, 2013 and 2014 in the United States; Sales reporting should be segmented into the following categories:

SUPPLIER ANNUAL SALES IN THE UNITED STATE FOR 2012, 2013, AND 2014			
Segment	**2012 Sales**	**2013 Sales**	**2014 Sales**
Cities			
Counties			
K-12 (Pubic/Private)			
Higher Education (Public/Private)			
States			
Other Public Sector and Nonprofits			
Federal			
Private Sector			
Total Supplier Sales			

5. Provide a list with contact information of your company's ten largest public agency customers. U.S. Communities Advisory Board Members are to be excluded from the list provided. Provide a list with contact information of five public agency customers that your company has lost in the last twelve months.

Distribution

1. Describe how your company proposes to distribute the Products nationwide.

2. Identify your company's authorized distributors and dealers by U.S. state.

3. Identify all other companies that will be involved in processing, handling or shipping the Product to the end user.

4. State the effectiveness of the proposed distribution in providing the lowest cost to the end user.

5. Provide the number, size and location of your company's distribution facilities, warehouses and retail network as applicable.

6. If applicable, describe your company's ability to do business with manufacturer/dealer/distribution organizations that are either small or MWBE businesses as defined by the Small Business Administration.

   a. If applicable, describe other ways your company can be sensitive to a Participating Public Agency's desire to utilize local and/or MWBE companies, such as number of local employees and offices in a particular geographic area, companies your firm is using that may be local (i.e. local delivery truck company), your company's diversity of owner employees, etc.

   b. If applicable, provide details on any products or services being offered by your company where the manufacturer or service provider is either a small or MWBE business as defined by the Small Business Administration. Provide product/service name, company name and small/MWBE designation.

Marketing

1. Outline your company's plan for marketing the Products to state and local government agencies nationwide.

2. Explain how your company will educate its national sales force about the Master Agreement.

3. Explain how your company will market and transition the Master Agreement into the primary offering to Participating Public Agencies.

4. Explain how your company plans to market the Master Agreement to existing government customers and transition these customers to the Master Agreement. Please provide the amount of purchases of existing public agency clients that your company will transition to the U.S. Communities contract for the initial three years of the contract in the following format within your proposal.

   a. $_____.00 will be transitioned in year one.
   b. $_____.00 will be transitioned in year two.
   c. $_____.00 will be transitioned in year three.

Products and Services

1. State your normal delivery time (in days) and any options for expediting delivery.

2. State restocking fees and procedures for returning products, if applicable.

3. Describe any special programs that your company offers that will improve customers' ability to access Products, on-time delivery or other innovative strategies.

4. Describe the capacity of your company to broaden the scope of the contract and keep the product offerings current and ensure that latest products, standards and technology for the Products and Services.

Quality

1. Describe your company's quality control processes.

2. Describe your problem escalation process.

3. How are customer complaints measured and categorized? What processes are in place to know that a problem has been resolved?

Administration

1. Describe your company's capacity to employ telephone, ecommerce, etc., with a specific proposal for processing orders under the Master Agreement.

2. State which forms of ordering allow the use of a procurement card and the accepted banking (credit card) affiliation.

3. Describe your company's internal management system for processing orders from point of customer contact through delivery and billing. Please state if you use a single system or platform for all phases of ordering, processing, delivery and billing.

4. Describe your company's ecommerce capabilities, including details about your ability to create punch out sites and accept orders electronically (cXML, OCI, etc.). Please detail where you have integrated with a pubic agency's ERP (PeopleSoft, Lawson, Oracle, SAP, etc.) system in the past and include some details about the resources you have in place to support these integrations. List, by ERP provider, the following information: name of public agency, ERP system used, "go live" date, net sales per calendar year since "go live", and percentage of agency sales being processed through this connection.

5. Describe any existing multi-state cooperative purchasing programs, if any, and include the entity's name(s), contact person(s), contact information and annual volume.

6. Describe the capacity of your company to report monthly sales under the Master Agreement by Participating Public Agency within each U.S. state.

7. Describe the capacity of your company to provide management reports, i.e. commodity histories, procurement card histories, green spend, etc. for each Participating Public Agency.

8. Please provide any suggested improvements and alternatives for doing business with your company that will make this arrangement more cost effective for your company and Participating Public Agencies.

National Staffing Plan

1. A staffing plan is required which describes the Proposer's proposed staff distribution to implement and manage this contract throughout the term of the contract. At a minimum, this plan should include the following:

    a. Identify the key personnel who will lead and support the implementation period of the contract outlined in Part IV, New Supplier Implementation Checklist, along with the amount of time to be devoted to implementation;

    b. Identify the key personnel who are to be engaged in this contract throughout the term of the contract and their relationship to the contracting organization;

    c. Provide a chart that shows 1) the time commitment of each professional staff member that will be devoted to the contract, 2) each member's role in maintaining and growing the contract; and 3) a timeline of each member's involvement throughout the contract.

2. Provide an organizational chart of your company.

3. Submit the resumes of the below personnel:

    a. The person your company proposes to serve as the National Accounts Manager,

    b. Each person that will be dedicated full time to U.S. Communities account management, and

    c. Key executive personnel that will be supporting the program.

Environmental

1. Provide a brief description of any company environmental initiatives, including your company's environmental strategy, your investment in being an environmentally preferable product leader, and any resources dedicated to your environmental strategy.

2. Describe your company's process for defining green products or sustainable processes.

3. Provide a green product listing. Describe any environmental attributes (recycled materials, energy efficiency, biodegradable, low-toxicity, etc.) or certifications achieved for each product.

4. Describe your product's recyclability. Describe any buy back or take back options offered. Describe your company's efforts to reduce or reuse packaging and minimize environmental footprint in the shipping process.

5. What percentage of your offering is environmentally preferable and what are your plans to improve this offering?

Additional Information

Please use this opportunity to describe any/all other features, advantages and benefits of your organization that you feel will provide additional value and benefit to a Participating Public Agency.

ADMINISTRATION AGREEMENT

This ADMINISTRATION AGREEMENT ("Agreement") is made as of _____, by and between U.S. COMMUNITIES GOVERNMENT PURCHASING ALLIANCE ("U.S. Communities") and _____ ("Supplier").

RECITALS

WHEREAS, _____("Lead Public Agency") has entered into a certain Master Agreement dated as of even date herewith, referenced as Agreement No. _____, by and between Lead Public Agency and Supplier (as amended from time to time in accordance with the terms thereof, the "Master Agreement") for the purchase of _____ (the "Products and Services");

WHEREAS, the Master Agreement provides that any state, county, city, special district, local government, school district, private K-12 school, technical or vocational school, higher education institution (including community colleges, colleges and universities, both public and private), other government agency or nonprofit organization (each a "Public Agency" and collectively, "Public Agencies") may purchase Products and Services at the prices indicated in the Master Agreement upon prior registration with U.S. Communities, in which case the Public Agency becomes a "Participating Public Agency";

WHEREAS, U.S. Communities has the administrative and legal capacity to administer purchases under the Master Agreement to Participating Public Agencies;

WHEREAS, U.S. Communities serves as the administrative agent for Lead Public Agency and other lead public agencies in connection with other master agreements offered by U.S. Communities;

WHEREAS, Lead Public Agency desires U.S. Communities to proceed with administration of the Master Agreement on the same basis as other master agreements;

WHEREAS, "U.S. Communities Government Purchasing Alliance" is a trade name licensed by U.S. Communities Purchasing & Finance Agency; and

WHEREAS, U.S. Communities and Supplier desire to enter into this Agreement to make available the Master Agreement to Participating Public Agencies.

NOW, THEREFORE, in consideration of the payments to be made hereunder and the mutual covenants contained in this Agreement, U.S. Communities and Supplier hereby agree as follows:

ARTICLE I

GENERAL TERMS AND CONDITIONS

1.1 The Master Agreement, attached hereto as Exhibit A and incorporated herein by reference as though fully set forth herein, and the terms and conditions contained therein shall apply to this Agreement except as expressly changed or modified by this Agreement.

1.2 U.S. Communities shall be afforded all of the rights, privileges and indemnifications afforded to Lead Public Agency under the Master Agreement, and such rights, privileges and indemnifications shall accrue and apply with equal effect to U.S. Communities under this Agreement including, without limitation, Supplier's obligation to provide insurance and certain indemnifications to Lead Public Agency.

1.3 Supplier shall perform all duties, responsibilities and obligations required under the Master Agreement in the time and manner specified by the Master Agreement.

1.4 U.S. Communities shall perform all of its duties, responsibilities and obligations as administrator of purchases under the Master Agreement as set forth herein, and Supplier acknowledges that U.S. Communities shall act in the capacity of administrator of purchases under the Master Agreement.

1.5 With respect to any purchases made by Lead Public Agency or any Participating Public Agency pursuant to the Master Agreement, U.S. Communities (a) shall not be construed as a dealer, re-marketer, representative, partner, or agent of any type of Supplier, Lead Public Agency or such Participating Public Agency, (b) shall not be obligated, liable or responsible (i) for any orders made by Lead Public Agency, any Participating Public Agency or any employee of Lead Public Agency or a Participating Public Agency under the Master Agreement, or (ii) for any payments required to be made with respect to such order, and (c) shall not be obligated, liable or responsible for any failure by a Participating Public Agency to (i) comply with procedures or requirements of applicable law, or (ii) obtain the due authorization and approval necessary to purchase under the Master Agreement. U.S. Communities makes no representations or guaranties with respect to any minimum purchases required to be made by Lead Public Agency, any Participating Public Agency, or any employee of Lead Public Agency or a Participating Public Agency under this Agreement or the Master Agreement.

ARTICLE II

TERM OF AGREEMENT

2.1 This Agreement is effective as of _____ and shall terminate upon termination of the Master Agreement or any earlier termination in accordance with the terms of this Agreement, provided, however, that the obligation to pay all amounts owed by Supplier to U.S. Communities through the termination of this Agreement and all indemnifications afforded by Supplier to U.S. Communities shall survive the term of this Agreement.

ARTICLE III

REPRESENTATIONS AND COVENANTS

3.1 U.S. Communities views the relationship with Supplier as an opportunity to provide benefits to both Public Agencies and Supplier. The successful foundation of the relationship requires certain representations and covenants from both U.S. Communities and Supplier.

3.2 U.S. Communities' Representations and Covenants.

(a) Marketing. U.S. Communities shall proactively market the Master Agreement to Public Agencies using resources such as a network of major sponsors including the National League

of Cities (NLC), National Association of Counties (NACo), United States Conference of Mayors (USCM), Association of School Business Officials (ASBO) and National Institute of Governmental Purchasing (NIGP) (collectively, the "Founding Co-Sponsors") and individual state-level sponsors. In addition, the U.S. Communities staff shall enhance Supplier's marketing efforts through meetings with Public Agencies, participation in key events and tradeshows and by providing online tools to Supplier's sales force.

(b) Training and Knowledge Management Support. U.S. Communities shall provide support for the education, training and engagement of Supplier's sales force as provided herein. Through its staff (each, a "Program Manager" and collectively, the "Program Managers"), U.S. Communities shall conduct training sessions with Supplier and shall conduct calls jointly with Supplier to Public Agencies. U.S. Communities shall also provide Supplier with access to U.S. Communities' private intranet website which provides presentations, documents and information to assist Supplier's sales force in effectively promoting the Master Agreement.

3.3 Supplier's Representations and Covenants. Supplier hereby represents and covenants as follows in order to ensure that Supplier is providing the highest level of public benefit to Participating Public Agencies (such representations and covenants are sometimes referred to as "Supplier's Commitments" and are comprised of the Corporate Commitment, Pricing Commitment, Economy Commitment and Sales Commitment):

(a) **Corporate Commitment**.

(i) The pricing, terms and conditions of the Master Agreement shall, at all times, be Supplier's primary contractual offering of Products and Services to Public Agencies. All of Supplier's direct and indirect marketing and sales efforts to Public Agencies shall demonstrate that the Master Agreement is Supplier's primary offering and not just one of Supplier's contract options.

(ii) Supplier's sales force (including inside, direct and/or authorized dealers, distributors and representatives) shall always present the Master Agreement when marketing Products or Services to Public Agencies.

(iii) Supplier shall advise all Public Agencies that are existing customers of Supplier as to the pricing and other value offered through the Master Agreement.

(iv) Upon authorization by a Public Agency, Supplier shall transition such Public Agency to the pricing, terms and conditions of the Master Agreement.

(v) Supplier shall ensure that the U.S. Communities program and the Master Agreement are actively supported by Supplier's senior executive management.

(vi) Supplier shall provide a national/senior management level representative with the authority and responsibility to ensure that the Supplier's Commitments are maintained at all times. Supplier shall also designate a lead referral contact person who shall be responsible for receiving communications from U.S. Communities concerning new Participating Public Agency registrations and for ensuring timely follow-up by Supplier's staff to requests for contact from Participating Public Agencies. Supplier shall also provide the personnel necessary to implement and support a supplier-based internet web page dedicated to Supplier's U.S. Communities program and linked to U.S. Communities' website and shall implement and support such web page.

(vii) Supplier shall demonstrate in its procurement solicitation response and throughout the term of the Master Agreement that national/senior management fully supports the U.S. Communities program and its commitments and requirements. National/Senior management is defined as the executive(s) with companywide authority.

(viii) Where Supplier has an existing contract for Products and Services with a state, Supplier shall notify the state of the Master Agreement and transition the state to the pricing, terms and conditions of the Master Agreement upon the state's request. Regardless of whether the state decides to transition to the Master Agreement, Supplier shall primarily offer the Master Agreement to all Public Agencies located within the state.

(b) **Pricing Commitment**.

(i) Supplier represents to U.S. Communities that the pricing offered under the Master Agreement is the lowest overall available pricing (net to purchaser) on Products and Services that it offers to Public Agencies. Supplier's pricing shall be evaluated on either an overall project basis or the Public Agency's actual usage for more frequently purchased Products and Services.

(ii) Contracts Offering Lower Prices. If a pre-existing contract and/or a Public Agency's unique buying pattern provide one or more Public Agencies a lower price than that offered under the Master Agreement, Supplier shall match that lower pricing under the Master Agreement and inform the eligible Public Agencies that the lower pricing is available under the Master Agreement. If an eligible Public Agency requests to be transitioned to the Master Agreement, Supplier shall do so and report the Public Agency's purchases made under the Master Agreement going forward. The price match only applies to the eligible Public Agencies. Below are three examples of Supplier's obligation to match the pricing under Supplier's contracts offering lower prices.

(A) Supplier holds a state contract with lower pricing that is available to all Public Agencies within the state. Supplier would be required to match the lower state pricing under the Master Agreement and make it available to all Public Agencies within the state.

(B) Supplier holds a regional cooperative contract with lower pricing that is available only to the ten cooperative members. Supplier would be required to match the lower cooperative pricing under the Master Agreement and make it available to the ten cooperative members.

(C) Supplier holds a contract with an individual Public Agency. The Public Agency contract does not contain any cooperative language and therefore other Public Agencies are not eligible to utilize the contract. Supplier would be required to match the lower pricing under the Master Agreement and make it available only to the individual Public Agency.

(iii) Deviating Buying Patterns. Occasionally U.S. Communities and Supplier may interact with a Public Agency that has a buying pattern or terms and conditions that considerably deviate from the normal Public Agency buying pattern and terms and conditions, and causes Supplier's pricing under the Master Agreement to be higher than an alternative contract held by Supplier. This could be created by a unique end-user preference or requirements. In the event that this situation occurs, Supplier may address the issue by lowering the price under the Master Agreement on the item(s) causing the large deviation for that Public Agency. Supplier would not be required to lower the price for other Public Agencies.

(iv) Supplier's Options in Responding to a Third Party Procurement Solicitation. While it is the objective of U.S. Communities to encourage Public Agencies to piggyback on to the Master Agreement rather than issue their own procurement solicitations, U.S. Communities recognizes that for various reasons some Public Agencies will issue their own solicitations. The following options are available to Supplier when responding to a Public Agency solicitation:

(A) Supplier may opt not to respond to the procurement solicitation. Supplier may make the Master Agreement available to the Public Agency as a comparison to its solicitation responses.

(B) Supplier may respond with the pricing, terms and conditions of the Master Agreement. If Supplier is awarded the contract, the sales would be reported as sales under the Master Agreement.

(C) If competitive conditions require pricing lower than the standard Master Agreement pricing, Supplier may submit lower pricing through the Master Agreement. If Supplier is awarded the contract, the sales would be reported as sales under the Master Agreement. Supplier would not be required to extend the lower price to other Public Agencies.

(D) Supplier may respond to the procurement solicitation with pricing that is higher (net to buyer) than the pricing offered under the Master Agreement. If awarded a contract, Supplier shall still be bound by all obligations set forth in this Section 3.3, including, without limitation, the requirement to continue to advise the awarding Public Agency of the pricing, terms and conditions of the Master Agreement.

(E) Supplier may respond to the procurement solicitation with pricing that is higher (net to buyer) than the pricing offered under the Master Agreement and if an alternative response is permitted, Supplier may offer the pricing under the Master Agreement as an alternative for consideration.

(c) **Economy Commitment**. Supplier shall demonstrate the benefits, including the pricing advantage, of the Master Agreement over alternative options, including competitive solicitation pricing and shall proactively offer the terms and pricing under the Master Agreement to Public Agencies as a more effective alternative to the cost and time associated with such alternate bids and solicitations.

(d) **Sales Commitment**. Supplier shall market the Master Agreement through Supplier's sales force or dealer network that is properly trained, engaged and committed to offering the Master Agreement as Supplier's primary offering to Public Agencies. Supplier's sales force compensation and incentives shall be greater than or equal to the compensation and incentives earned under other contracts to Public Agencies.

(i) Supplier Sales. Supplier shall be responsible for proactive direct sales of Supplier's Products and Services to Public Agencies and the timely follow-up to sales leads identified by U.S. Communities. Use of product catalogs, targeted advertising, direct mail and other sales initiatives are encouraged. All of Supplier's sales materials targeted towards Public Agencies shall include the U.S. Communities logo. U.S. Communities hereby grants to Supplier, during the term of this Agreement, a non-exclusive, revocable, non-transferable, license to use the U.S. Communities name, trademark, and logo solely to perform its obligations under this Agreement, and for no other purpose. Any goodwill, rights, or benefits derived from Supplier's use of the U.S. Communities name, trademark, or logo shall inure to the benefit of U.S. Communities. U.S. Communities shall provide Supplier with its logo and the standards to be employed in the use of the logo. During the term of the Agreement, the Supplier shall provide U.S. Communities with its logo and the standards to be employed in the use of

the logo for purposes of reproducing and using Supplier's name and logo in connection with the advertising, marketing and promotion of the Master Agreement to Public Agencies. Supplier shall assist U.S. Communities by providing camera-ready logos and by participating in related trade shows and conferences. At a minimum, Supplier's sales initiatives shall communicate that (i) the Master Agreement was competitively solicited by the Lead Public Agency, (ii) the Master Agreement provides the best government pricing, (iii) there is no cost to Participating Public Agencies, and (iv) the Master Agreement is a non-exclusive contract.

(ii) Branding and Logo Compliance. Supplier shall be responsible for complying with the U.S. Communities branding and logo standards and guidelines. Prior to use by Supplier, all U.S. Communities related marketing material must be submitted to U.S. Communities for review and approval.

(iii) Sales Force Training. Supplier shall train its national sales force on the Master Agreement and U.S. Communities program. U.S. Communities shall be available to train regional or district managers and generally assist with the education of sales personnel.

(iv) Participating Public Agency Access. Supplier shall establish the following communication links to facilitate customer access and communication:

(A) A dedicated U.S. Communities internet web-based homepage containing:

(1) U.S. Communities standard logo with Founding Co-Sponsors logos;
(2) Copy of original procurement solicitation;
(3) Copy of Master Agreement including any amendments;
(4) Summary of Products and Services pricing;
(5) Electronic link to U.S. Communities' online registration page; and
(6) Other promotional material as requested by U.S. Communities.

(B) A dedicated toll-free national hotline for inquiries regarding U.S. Communities.

(C) A dedicated email address for general inquiries in the following format: uscommunities@(name of supplier).com.

(v) Electronic Registration. Supplier shall be responsible for ensuring that each Public Agency has completed U.S. Communities' online registration process prior to processing the Public Agency's first sales order.

(vi) Supplier's Performance Review. Upon request by U.S. Communities, Supplier shall participate in a performance review meeting with U.S. Communities to evaluate Supplier's performance of the covenants set forth in this Agreement.

(vii) Supplier Content. Supplier may, from time to time, provide certain graphics, media, and other content to U.S. Communities (collectively "Supplier Content") for use on U.S. Communities websites and for general marketing and publicity purposes. During the term of the Agreement, Supplier hereby grants to U.S. Communities and its affiliates a non-exclusive, worldwide, free, transferrable, license to reproduce, modify, distribute, publically perform, publically display, and use Supplier Content in connection with U.S. Communities websites and for general marketing and publicity purposes, with the right to sublicense each and every such right. Supplier warrants that: (a) Supplier is the owner of

or otherwise has the unrestricted right to grant the rights in and to Supplier Content as contemplated hereunder; and (b) the use of Supplier Content and any other materials or services provided to U.S. Communities as contemplated hereunder will not violate, infringe, or misappropriate the intellectual property rights or other rights of any third party

3.4 Breach of Supplier's Representations and Covenants. The representations and covenants set forth in this Agreement are the foundation of the relationship between U.S. Communities and Supplier. If Supplier is found to be in violation of, or non-compliance with, one or more of the representations and covenants set forth in this Agreement, Supplier shall have ninety (90) days from the notice of default to cure such violation or non-compliance and, if Supplier fails to cure such violation or non-compliance within such notice period, it shall be deemed a cause for immediate termination of the Master Agreement at Lead Public Agency's sole discretion or this Agreement at U.S. Communities' sole discretion.

3.5 Indemnity. Supplier hereby agrees to indemnify and defend U.S. Communities, and its parent companies, subsidiaries, affiliates, shareholders, member, manager, officers, directors, employees, agents, and representatives from and against any and all claims, costs, proceedings, demands, losses, damages, and expenses (including, without limitation, reasonable attorney's fees and legal costs) of any kind or nature, arising from or relating to, any actual or alleged breach of any of Supplier's representations, warranties, or covenants in this Agreement.

ARTICLE IV

PRICING AUDITS

4.1 Supplier shall, at Supplier's sole expense, maintain an accounting of all purchases made by Lead Public Agency and Participating Public Agencies under the Master Agreement. U.S. Communities and Lead Public Agency each reserve the right to audit the accounting for a period of three (3) years from the time such purchases are made. This audit right shall survive termination of this Agreement for a period of one (1) year from the effective date of termination. U.S. Communities shall have the authority to conduct random audits of Supplier's pricing that is offered to Participating Public Agencies at U.S. Communities' sole cost and expense. Notwithstanding the foregoing, in the event that U.S. Communities is made aware of any pricing being offered to three (3) or more Participating Public Agencies that is materially inconsistent with the pricing under the Master Agreement, U.S. Communities shall have the ability to conduct a reasonable audit of Supplier's pricing at Supplier's sole cost and expense during regular business hours upon reasonable notice. U.S. Communities may conduct the audit internally or may engage a third-party auditing firm on a non-contingent basis. Supplier shall solely be responsible for the cost of the audit up to the first $50,000 and U.S. Communities and Supplier shall each be responsible for fifty percent (50%) of the audit costs that exceed $50,000. In the event of an audit, the requested materials shall be provided in the format and at the location where kept in the ordinary course of business by Supplier.

ARTICLE V

FEES & REPORTING

5.1 Administrative Fees. Supplier shall pay to U.S. Communities a monthly administrative fee based upon the total sales price of all purchases shipped and billed pursuant to the Master Agreement, excluding taxes, in the amount of two percent (2%) of aggregate purchases made during each calendar month (individually and collectively, "Administrative Fees"). Supplier's annual sales

shall be measured on a calendar year basis. All Administrative Fees shall be payable in U.S. Dollars and shall be made by wire to U.S. Communities, or its designee or trustee as may be directed in writing by U.S. Communities. Administrative Fees shall be due and payable within thirty (30) days of the end of each calendar month for purchases shipped and billed during such calendar month. U.S. Communities agrees to pay to Lead Public Agency five percent (5%) of all Administrative Fees received from Supplier to help offset Lead Public Agency's costs incurred in connection with managing the Master Agreement nationally.

5.2 Sales Reports. Within thirty (30) days of the end of each calendar month, Supplier shall deliver to U.S. Communities an electronic accounting report, in the format prescribed by Exhibit B, attached hereto, summarizing all purchases made under the Master Agreement during such calendar month ("Sales Report"). All purchases indicated in the Sales Report shall be denominated in U.S. Dollars. All purchases shipped and billed pursuant to the Master Agreement for the applicable calendar month shall be included in the Sales Report. U.S. Communities reserves the right upon reasonable advance notice to Supplier to change the prescribed report format to accommodate the distribution of the Administrative Fees to its program sponsors and state associations.

(a) Monthly Sales Reports shall include all sales reporting under the Master Agreement, and a breakout of Environmental Preferable (Green) sales reporting. Supplier must make reasonable attempts at filling in all required information and contact U.S. Communities with a plan to correct any deficiencies of data field population.

(b) Submitted reports shall be verified by U.S. Communities against its registration database. Any data that is inconsistent with the registration database shall be changed prior to processing.

5.3 Exception Reporting/Sales Reports Audits. U.S. Communities or its designee may, at its sole discretion, compare Supplier's Sales Reports with Participating Public Agency records or other sales analysis performed by Participating Public Agencies, sponsors, advisory board members or U.S. Communities staff. If there is a material discrepancy between the Sales Report and such records or sales analysis as determined by U.S. Communities, U.S. Communities shall notify Supplier in writing and Supplier shall have thirty (30) days from the date of such notice to resolve the discrepancy to U.S. Communities' reasonable satisfaction. Upon resolution of the discrepancy, Supplier shall remit payment to U.S. Communities' trustee within fifteen (15) calendar days. Any questions regarding an exception report should be directed to U.S. Communities in writing to reporting@uscommunities.org. If Supplier does not resolve the discrepancy to U.S. Communities' reasonable satisfaction within thirty (30) days, U.S. Communities shall have the right to engage outside services to conduct an independent audit of Supplier's reports. Supplier shall solely be responsible for the cost of the audit up to the first $50,000 and U.S. Communities and Supplier shall each be responsible for fifty percent (50%) of the audit costs that exceed $50,000.

5.4 Online Reporting. Within sixty (60) days of the end of each calendar quarter, U.S. Communities shall provide online reporting to Supplier containing Supplier's sales reporting for such calendar quarter. Supplier shall contact U.S. Communities within fifteen (15) days of receiving notification of the online reporting and report to U.S. Communities any concerns or disputes regarding the reports, including but not limited to concerns regarding the following:

Report Name	Follow up with U.S. Communities
5 Qtr Drop Sales Analysis	Financial & Reporting Manager
Zero States Sales Report	Program Manager
Registered Agency Without Sales Report	Program Manager

Supplier shall have access to the above reports through the U.S. Communities intranet website. The following additional reports are also available to Supplier and are useful in resolving reporting issues and enabling Supplier to better manage its Master Agreement:

(i) Agency Sales by Population/Enrollment Report
(ii) Hot Prospect Sales Report
(iii) New Lead Sales Report
(iv) State Comparison Sales Report
(v) Advisory Board Usage Report
(vi) Various Agency Type Comparison Reports
(vii) Sales Report Builder

5.5 Supplier's Failure to Provide Reports or Pay Administrative Fees. Failure to provide a Sales Report or pay Administrative Fees within the time and in the manner specified herein shall be regarded as a material breach under this Agreement and if not cured within thirty (30) days of written notice to Supplier, shall be deemed a cause for termination of the Master Agreement at Lead Public Agency's sole discretion or this Agreement at U.S. Communities' sole discretion. All Administrative Fees not paid within thirty (30) days of the end of the previous calendar month shall bear interest at the rate of one and one-half percent (1.5%) per month until paid in full.

ARTICLE VI

MISCELLANEOUS

6.1 Entire Agreement. This Agreement supersedes any and all other agreements, either oral or in writing, between the parties hereto with respect to the subject matter hereof, and no other agreement, statement, or promise relating to the subject matter of this Agreement which is not contained herein shall be valid or binding.

6.2 Attorney's Fees. If any action at law or in equity is brought to enforce or interpret the provisions of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees and costs in addition to any other relief to which such party may be entitled.

6.3 Assignment.

(a) Supplier. Neither this Agreement nor any rights or obligations hereunder shall be assignable by Supplier without prior written consent of U.S. Communities, and any assignment without such consent shall be void.

(b) U.S. Communities. This Agreement and any rights or obligations hereunder may be assigned by U.S. Communities in U.S. Communities' sole discretion, to an existing or newly established legal entity that has the authority and capacity to perform U.S. Communities' obligations hereunder.

6.4 Notices. All reports, notices or other communications given hereunder shall be delivered by first-class mail, postage prepaid, or overnight delivery requiring signature on receipt to the addresses as set forth below. U.S. Communities may, by written notice delivered to Supplier, designate any different address to which subsequent reports, notices or other communications shall be sent.

U.S. Communities: U.S. Communities
2999 Oak Road, Suite 710
Walnut Creek, California 94597
Attn: Program Manager Administration

Supplier: _____
_____
_____
_____
Attn: U.S. Communities Program Manager

6.5 Severability. If any provision of this Agreement shall be deemed to be, or shall in fact be, illegal, inoperative or unenforceable, the same shall not affect any other provision or provisions herein contained or render the same invalid, inoperative or unenforceable to any extent whatever.

6.6 Waiver. Any failure of a party to enforce, for any period of time, any of the provisions under this Agreement shall not be construed as a waiver of such provisions or of the right of said party thereafter to enforce each and every provision under this Agreement.

6.7 Counterparts. This Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

6.8 Modifications. This Agreement may not be effectively amended, changed, modified, altered or terminated without the prior written consent of the parties hereto.

6.9 Governing Law; Arbitration. This Agreement will be governed by and interpreted in accordance with the laws of the State of California without regard to any conflict of laws principles. Any dispute, claim, or controversy arising out of or relating to this Agreement or the breach, termination, enforcement, interpretation or validity thereof, including the determination of the scope or applicability of this dispute resolution clause, shall be determined by arbitration in Walnut Creek, California, before one (1) arbitrator. The arbitration shall be administered by JAMS pursuant to its Comprehensive Arbitration Rules and Procedures. Judgment on the award may be entered in any court having jurisdiction. This clause shall not preclude parties from seeking provisional remedies in aid of arbitration from a court of appropriate jurisdiction. The prevailing party will be entitled to recover its reasonable attorneys' fees and arbitration costs from the other party. The arbitration award shall be final and binding. Each party commits that prior to commencement of arbitration proceedings, the parties shall submit the dispute to JAMS for mediation. The parties will cooperate with JAMS and with one another in selecting a mediator from JAMS panel of neutrals, and in promptly scheduling the mediation proceedings. The parties covenant that they will participate in the mediation in good faith, and that they will share equally in its costs. The mediation will be conducted by each party designating a duly authorized officer or other representative to represent the party with the authority to bind the party, and that the parties agree to exchange informally such information as is reasonably necessary and relevant to the issues being mediated. All offers,

promises, conduct, and statements, whether oral or written, made in the course of the mediation by any of the parties, their agents, employees, experts, and attorneys, and by the mediator or any JAMS employees, are confidential, privileged, and inadmissible for any purpose, including impeachment, in any arbitration or other proceeding involving the parties, provided that evidence that is otherwise admissible or discoverable shall not be rendered inadmissible or non-discoverable as a result of its use in the mediation. If the dispute is not resolved within thirty (30) days from the date of the submission of the dispute to mediation (or such later date as the parties may mutually agree in writing), the administration of the arbitration shall proceed. The mediation may continue, if the parties so agree, after the appointment of the arbitrator. Unless otherwise agreed by the parties, the mediator shall be disqualified from serving as arbitrator in the case. The pendency of a mediation shall not preclude a party from seeking provisional remedies in aid of the arbitration from a court of appropriate jurisdiction, and the parties agree not to defend against any application for provisional relief on the ground that a mediation is pending.

6.10 Successors and Assigns. This Agreement shall inure to the benefit of and shall be binding upon U.S. Communities, Supplier and any successor and assign thereto; subject, however, to the limitations contained herein.

[*Remainder of Page Intentionally Left Blank – Signatures Follow*]

IN WITNESS WHEREOF, U.S. Communities has caused this Agreement to be executed in its name and Supplier has caused this Agreement to be executed in its name, all as of the date first written above.

U.S. Communities:

U.S. COMMUNITIES GOVERNMENT PURCHASING ALLIANCE

By _____

Name:_____

Title: _____

Supplier:

_____

By _____

Name:_____

Title: _____

ATTACHMENT A

MASTER AGREEMENT

(City of Houston Master Agreement/Contract to be attached at time of award.)

ATTACHMENT B

SALES REPORT FORMAT

Appendix B - US (Data Format)

Sales Report Template

TIN	Supplier ID	Account No.	Agency Name	Dept Name	Address	City	State	Zip	Agency Type	Year	Qtr	Month	Amount
956000735	160	89518997	CITY OF LA/MGMT EMPL SVCS	Purchasing	555 RAMIREZ ST STE 312	LOS ANGELES	CA	90012	20	2012	2	5	1525.50
956000222	160	34868035	LOS ANGELES COUNTY	Facilities	350 S FIGUEROA ST STE 700	LOS ANGELES	CA	90071	30	2012	2	5	1603.64
956000735	160	89496461	CITY OF LA/ENVIRON AFFAIR	Purchasing	555 RAMIREZ ST STE 312	LOS ANGELES	CA	90012	20	2012	2	5	1625.05
956000735	160	89374835	CITY OF LA/COMMUNITY DEV	Purchasing	555 RAMIREZ ST STE 312	LOS ANGELES	CA	90012	20	2012	2	5	45090.79
066002010	160	328NA0001053	GROTON TOWN OF PUBLIC WORKS	Water	123 A St.	GROTON	CT	06340	20	2012	2	5	318.00
066001854	160	328NA0001051	GROTON CITY OF	Administration	123 A St.	GROTON	CT	06340	20	2012	2	5	212.00

SALES REPORT DATA FORMAT

Column Name	Required	Data Type	Length	Example	Comment
TIN	Optional	Text	9	956000735	No Dash, Do not omit leading zero.
Supplier ID	Yes	Number	3	111	See Supplier ID Table Below
Account No.	Optional	Text	25 max	Depends on supplier account no.	
Agency Name	Yes	Text	255 max	Los Angeles County	
Dept Name	Optional	Text	255 max	Purchasing Dept	
Address	Yes	Text	255 max		
City	Yes	Text	255 max	Los Angeles	Must be a valid City name
State	Yes	Text	2	CA	
Zip	Yes	Text	5	90071	No Dash, Do not omit leading zero, Valid zip code
Agency Type	Yes	Number	2	30	See Agency Type Table Below
Year	Yes	Number	4	2010	
Qtr	Yes	Number	1	4	
Month	Yes	Number	2	12	
Amount	Yes	Number	variable	45090.79	Two digit decimal point, no $ sign or commas

Agency Type Table

Agency Type ID	Agency Type Description
10	K-12
11	Community College
12	College and University
20	City
21	City Special District
22	Consolidated City/County
30	County
31	County Special District
40	Federal
41	Crown Corporations
50	Housing Authority
80	State Agency
81	Independent Special District
82	Non-Profit
84	Other

MASTER INTERGOVERNMENTAL COOPERATIVE PURCHASING AGREEMENT

This Master Intergovernmental Cooperative Purchasing Agreement ("Agreement") is made between certain government agencies that execute a Lead Public Agency Certificate (collectively, "Lead Public Agencies") to be appended and made a part hereof and other government agencies ("Participating Public Agencies") that agree to the terms and conditions hereof through the U.S. Communities registration process and made a part hereof.

RECITALS

WHEREAS, after a competitive solicitation and selection process by Lead Public Agencies, in compliance with their own policies, procedures, rules and regulations, a number of suppliers (each, a "Contract Supplier") have entered into Master Agreements with Lead Public Agencies to provide a variety of goods, products and services based on national and international volumes (herein "Products and Services");

WHEREAS, Master Agreements are made available by Lead Public Agencies through U.S. Communities and provide that Participating Public Agencies may purchase Products and Services on the same terms, conditions and pricing as the Lead Public Agency, subject to any applicable local purchasing ordinances and the laws of the State of purchase;

WHEREAS, the parties desire to comply with the requirements and formalities of any intergovernmental cooperative act, if applicable, to the laws of the State of purchase;

WHEREAS, the parties hereto desire to conserve resources and reduce procurement cost;

WHEREAS, the parties hereto desire to improve the efficiency, effectiveness and economy of the procurement of necessary Products and Services;

NOW, THEREFORE, in consideration of the mutual promises contained in this Agreement, and of the mutual benefits to result, the parties agree as follows:

1. That each party will facilitate the cooperative procurement of Products and Services.

2. That the procurement of Products and Services subject to this Agreement shall be conducted in accordance with and subject to the relevant statutes, ordinances, rules and regulations that govern each party's procurement practices.

3. That the cooperative use of solicitations obtained by a party to this Agreement shall be in accordance with the terms and conditions of the solicitation, except as modification of those terms and conditions is otherwise allowed or required by applicable law.

4. That the Lead Public Agencies will make available, upon reasonable request and subject to convenience, information which may assist in improving the effectiveness, efficiency and economy of Participating Public Agencies' procurement of Products and Services.

5. That the Participating Public Agency will make timely payments to the Contract Supplier for Products and Services received in accordance with the terms and conditions of the procurement. Payment, inspections and acceptance of Products and Services ordered by the Participating Public Agency shall be the exclusive obligation of such Participating Public Agency. Disputes between the Participating Public Agency and Contract Supplier are to be resolved in accord with the law and venue rules of the State of purchase.

6. The Participating Public Agency shall not use this Agreement as a method for obtaining additional concessions or reduced prices for similar products or services.

7. The Participating Public Agency is solely responsible for ordering, accepting, and paying and any other action, inaction or decision regarding the Products and Services obtained under this Agreement. A Lead Public Agency shall not be liable in any manner for any action or inaction or decisions taken by a Participating Public Agency. The Participating Public Agency shall, to the extent permitted by applicable law, hold the Lead Public Agency harmless from any liability that may arise from action or inaction of the Participating Public Agency.

8. The exercise of any rights or remedies by the Participating Public Agency shall be the exclusive obligation of such Participating Public Agency.

9. This Agreement shall remain in effect until termination by a party giving thirty (30) days prior written notice to U.S. Communities at 2999 Oak Road, Suite 710, Walnut Creek, CA 94597.

10. This Agreement shall become effective after execution of the Lead Public Agency Certificate or Participating Public Agency registration, as applicable.

STATE NOTICE ADDENDUM

Pursuant to certain state notice provisions the following public agencies and political subdivisions of the referenced public agencies are eligible to access the contract award made pursuant to this solicitation. Public agencies and political subdivisions are hereby given notice of the foregoing request for proposal for purposes of complying with the procedural requirements of said statutes:

Nationwide:

http://www.usa.gov/Agencies/Local_Government/Cities.shtml

Other states:

State of Oregon, State of Hawaii, State of Washington

State: HI
Account Type: HI Counties, Cities, Colleges
Hawaii County
Honolulu County
Kauai County
Maui County
Kalawao County
Aiea
Anahola
Barbers Point N A S
Camp H M Smith
Captain Cook
Eleele
Ewa Beach
Fort Shafter
Haiku
Hakalau
Haleiwa
Hana
Hanalei
Hanamaulu
Hanapepe
Hauula
Hawaii National Park
Hawaiian Ocean View
Hawi
Hickam AFB
Hilo
Holualoa
Honaunau
Honokaa
Honolulu
Honomu
Hoolehua
Kaaawa
Kahuku
Kahului
Kailua
Kailua Kona
Kalaheo
Kalaupapa
Kamuela
Kaneohe
Kapaa
Kapaau
Kapolei
Kaumakani
Kaunakakai
Kawela Bay
Keaau
Kealakekua
Kealia
Keauhou
Kekaha
Kihei
Kilauea
Koloa
Kualapuu
Kula
Kunia

Kurtistown
Lahaina
Laie
Lanai City
Laupahoehoe
Lawai
Lihue
M C B H Kaneohe Bay
Makawao
Makaweli
Maunaloa
Mililani
Mountain View
Naalehu
Ninole
Ocean View
Ookala
Paauhau
Paauilo
Pahala
Pahoa
Paia
Papaaloa
Papaikou
Pearl City
Pearl Harbor
Pepeekeo
Princeville
Pukalani
Puunene
Schofield Barracks
Tripler Army Medical Center
Volvano
Wahiawa
Waialua
Waianae
Waikoloa
Wailuku
Waimanalo
Waimea
Waipahu
Wake Island
Wheeler Army Airfield
Brigham Young University - Hawaii
Chaminade University of Honolulu
Hawaii Business College
Hawaii Pacific University
Hawaii Technology Institute
Heald College - Honolulu
Remington College - Honolulu Campus
University of Phoenix - Hawaii Campus
Hawaii Community College
Honolulu Community College
Kapiolani Community College
Kauai Community College
Leeward Community College
Maui Community College
University of Hawaii at Hilo
University of Hawaii at Manoa
Windward Community College

State: HI **(122 records)**

Account Type: K-12 **(16 records)**

Malama Honua Public Charter School
ST JOHN THE BAPTIST
Waimanalo Elementary and Intermediate School
Kailua High School
PACIFIC BUDDHIST ACADEMY
HAWAII TECHNOLOGY ACADEMY
CONGREGATION OF CHRISTIAN BROTHERS OF HAWAII, INC.
MARYKNOLL SCHOOL
ISLAND SCHOOL
STATE OF HAWAII, DEPT. OF EDUCATION
KE KULA O S. M. KAMAKAU
KAMEHAMEHA SCHOOLS
HANAHAU`OLI SCHOOL
EMMANUAL LUTHERAN SCHOOL
School Lunch Program
Our Savior Lutheran School

Account Type: County **(5 records)**

BOARD OF WATER SUPPLY
MAUI COUNTY COUNCIL
Kauai County Council
Honolulu Fire Department
COUNTY OF MAUI

Account Type: Non-Profit **(70 records)**

Lanai Community Health Center
Maui High Band Booster Club
Naalehu Assembly of God
outrigger canoe club
One Kalakaua
Native Hawaiian Hospitality Association
St. Theresa School
Hawaii Peace and Justice
Kauai Youth Basketball Association
NA HALE O MAUI
LEEWARD HABITAT FOR HUMANITY
WAIANAE COMMUNITY OUTREACH
NA LEI ALOHA FOUNDATION
HAWAII FAMILY LAW CLINIC DBA ALA KUOLA
BUILDING INDUSTRY ASSOCIATION OF HAWAII
UNIVERSITY OF HAWAII FEDERAL CREDIT UNION
LANAKILA REHABILITATION CENTER INC.
POLYNESIAN CULTURAL CENTER
CTR FOR CULTURAL AND TECH INTERCHNG BETW EAST AND WEST
BISHOP MUSEUM
ALOCHOLIC REHABILITATION SVS OF HI INC DBA HINA MAUKA
ASSOSIATION OF OWNERS OF KUKUI PLAZA
MAUI ECONOMIC DEVELOPMENT BOARD
NETWORK ENTERPRISES, INC.
HONOLULU HABITAT FOR HUMANITY
ALOHACARE
ORI ANUENUE HALE, INC.
IUPAT, DISTRICT COUNCIL 50
GOODWILL INDUSTRIES OF HAWAII, INC.
HAROLD K.L. CASTLE FOUNDATION
MAUI ECONOMIC OPPORTUNITY, INC.
EAH, INC.
PARTNERS IN DEVELOPMENT FOUNDATION
HABITAT FOR HUMANITY MAUI
W. M. KECK OBSERVATORY
HAWAII EMPLOYERS COUNCIL
HAWAII STATE FCU
MAUI COUNTY FCU
PUNAHOU SCHOOL
YMCA OF HONOLULU
EASTER SEALS HAWAII
AMERICAN LUNG ASSOCIATION
Pohaha I Ka Lani
Hawaii Area Committee
Lanai Federal Credit Union
READ TO ME INTERNATIONAL FOUNDATION
MAUI FAMILY YMCA
WAILUKU FEDERAL CREDIT UNION
ST. THERESA CHURCH
HALE MAHAOLU
West Maui Community Federal Credit Union
Hawaii Island Humane Society
Kama'aina Care Inc
International Archaeological Research Institute, Inc.
Community Empowerment Resources
Tutu and Me Traveling Preschool
First United Methodist Church
AOAO Royal Capitol Plaza
Kumpang Lanai
Child and Family Service
MARINE SURF WAIKIKI, INC.
Hawaii Health Connector

Hawaii Carpenters Market Recovery Program Fund
Puu Heleakala Community Association
Saint Louis School
Kailua Racquet Club, Ltd.
Homewise Inc.
Hawaii Baptist Academy
Kroc Center Hawaii
Kupu

Account Type: College and University **(8 records)**

University of the Nations
ARGOSY UNIVERSITY
HAWAII PACIFIC UNIVERSITY
UNIVERSITY OF HAWAII AT MANOA
RESEARCH CORPORATION OF THE UNIVERSITY OF HAWAII
BRIGHAM YOUNG UNIVERSITY - HAWAII
University Clinical Research and Association
CHAMINADE UNIVERSITY OF HONOLULU

Account Type: Other **(7 records)**

Hawaii Information Consortium
Leeward Community Church
E Malama In Keiki O Lanai
Keawala'i Congregational Church
Lanai Community Hospital
Angels at Play Preschool & Kindergarten
Queen Emma Gardens AOAO

Account Type: Community College **(2 records)**

Honolulu Community College
COLLEGE OF THE MARSHALL ISLANDS

Account Type: State Agency **(10 records)**

DOT Airports Division Hilo International Airport
Judiciary - State of Hawaii
ADMIN. SERVICES OFFICE
SOH- JUDICIARY CONTRACTS AND PURCH
STATE DEPARTMENT OF DEFENSE
HAWAII CHILD SUPPORT ENFORCEMENT AGENCY
HAWAII HEALTH SYSTEMS CORPORATION
HAWAII AGRICULTURE RESEARCH CENTER
STATE OF HAWAII
Third Judicial Circuit - State of Hawaii

Account Type: Consolidated City/County **(2 records)**

CITY AND COUNTY OF HONOLULU
Lanai Youth Center

Account Type: Federal **(2 records)**

US Navy
Defense Information System Agency

State: OR **(1,221 records)**

Account Type: K-12 **(215 records)**

Warrenton Hammond School
Columbia Academy
VALLEY CATHOLIC SCHL
CROOK COUNTY SCHOOL DISTRICT
CORBETT SCHL DIST #39
Bethel School District #52
St. Therese Parish/School
Portland YouthBuilders
Wallowa County ESD
Fern Ridge School District 28J
Knova Learning
New Horizon Christian School
MOLALLA RIVER ACADEMY
HIGH DESERT EDUCATION SERVICE DISTRICT
SOUTHWEST CHARTER SCHOOL
WHITEAKER MONTESSORI SCHOOL
CASCADES ACADEMY OF CENTRAL OREGON
NEAH-KAH-NIE DISTRICT NO.56
INTER MOUNTAIN ESD
STANFIELD SCHOOL DISTRICT
LA GRANDE SCHOOL DISTRICT
CASCADE SCHOOL DISTRICT
DUFUR SCHOOL DISTRICT NO.29
hillsboro school district
GASTON SCHOOL DISTRICT 511J
BEAVERTON SCHOOL DISTRICT
COUNTY OF YAMHILL SCHOOL DISTRICT 29
WILLAMINA SCHOOL DISTRICT
MCMINNVILLE SCHOOL DISTRICT NO.40
Sheridan School District 48J
THE CATLIN GABEL SCHOOL
NORTH WASCO CTY SCHOOL DISTRICT 21 - CHENOWITH
CENTRAL CATHOLIC HIGH SCHOOL
CANYONVILLE CHRISTIAN ACADEMY

OUR LADY OF THE LAKE SCHOOL
NYSSA SCHOOL DISTRICT NO. 26
ARLINGTON SCHOOL DISTRICT NO. 3
LIVINGSTONE ADVENTIST ACADEMY
Santiam Canyon SD 129J
WEST HILLS COMMUNITY CHURCH
BANKS SCHOOL DISTRICT
WILLAMETTE EDUCATION SERVICE DISTRICT
BAKER COUNTY SCHOOL DIST. 16J - MALHEUR ESD
HARNEY EDUCATION SERVICE DISTRICT
GREATER ALBANY PUBLIC SCHOOL DISTRICT
LAKE OSWEGO SCHOOL DISTRICT 7J
SOUTHERN OREGON EDUCATION SERVICE DISTRICT
SILVER FALLS SCHOOL DISTRICT
St Helens School District
DAYTON SCHOOL DISTRICT NO.8
Amity School District 4-J
SCAPPOOSE SCHOOL DISTRICT 1J
REEDSPORT SCHOOL DISTRICT
FOREST GROVE SCHOOL DISTRICT
DAVID DOUGLAS SCHOOL DISTRICT
LOWELL SCHOOL DISTRICT NO.71
TIGARD-TUALATIN SCHOOL DISTRICT
SHERWOOD SCHOOL DISTRICT 88J
RAINIER SCHOOL DISTRICT
NORTH CLACKAMAS SCHOOL DISTRICT
MONROE SCHOOL DISTRICT NO.1J
CHILDPEACE MONTESSORI
HEAD START OF LANE COUNTY
HARNEY COUNTY SCHOOL DIST. NO.3
NESTUCCA VALLEY SCHOOL DISTRICT NO.101
ARCHBISHOP FRANCIS NORBERT BLANCHET SCHOOL
LEBANON COMMUNITY SCHOOLS NO.9
MT.SCOTT LEARNING CENTERS
SEVEN PEAKS SCHOOL
DE LA SALLE N CATHOLIC HS
MULTISENSORY LEARNING ACADEMY
MITCH CHARTER SCHOOL
REALMS CHARTER SCHOOL
BAKER SCHOOL DISTRICT 5-J
PHILOMATH SCHOOL DISTRICT
CLACKAMAS EDUCATION SERVICE DISTRICT
CANBY SCHOOL DISTRICT
OREGON TRAIL SCHOOL DISTRICT NO.46
WEST LINN WILSONVILLE SCHOOL DISTRICT
MOLALLA RIVER SCHOOL DISTRICT NO.35
ESTACADA SCHOOL DISTRICT NO.108
GLADSTONE SCHOOL DISTRICT
ASTORIA SCHOOL DISTRICT 1C
SEASIDE SCHOOL DISTRICT 10
NORTHWEST REGIONAL EDUCATION SERVICE DISTRICT
VERNONIA SCHOOL DISTRICT 47J
SOUTH COAST EDUCATION SERVICE DISTRICT
COOS BAY SCHOOL DISTRICT NO.9
COOS BAY SCHOOL DISTRICT
NORTH BEND SCHOOL DISTRICT 13
COQUILLE SCHOOL DISTRICT 8
MYRTLE POINT SCHOOL DISTRICT NO.41
BANDON SCHOOL DISTRICT
BROOKING HARBOR SCHOOL DISTRICT NO.17-C
REDMOND SCHOOL DISTRICT
DESCHUTES COUNTY SD NO.6 - SISTERS SD
DOUGLAS EDUCATION SERVICE DISTRICT
ROSEBURG PUBLIC SCHOOLS
GLIDE SCHOOL DISTRICT NO.12
SOUTH UMPQUA SCHOOL DISTRICT #19
YONCALLA SCHOOL DISTRICT NO.32
ELKTON SCHOOL DISTRICT NO.34
DOUGLAS COUNTY SCHOOL DISTRICT 116
HOOD RIVER COUNTY SCHOOL DISTRICT
PHOENIX-TALENT SCHOOL DISTRICT NO.4
CENTRAL POINT SCHOOL DISTRICT NO. 6
JACKSON CO SCHOOL DIST NO.9
ROGUE RIVER SCHOOL DISTRICT NO.35
MEDFORD SCHOOL DISTRICT 549C
CULVER SCHOOL DISTRICT NO.
JEFFERSON COUNTY SCHOOL DISTRICT 509-J
GRANTS PASS SCHOOL DISTRICT 7
LOST RIVER JR/SR HIGH SCHOOL
KLAMATH FALLS CITY SCHOOLS
LANE COUNTY SCHOOL DISTRICT 4J
SPRINGFIELD SCHOOL DISTRICT NO.19
CRESWELL SCHOOL DISTRICT
SOUTH LANE SCHOOL DISTRICT 45J3
LANE COUNTY SCHOOL DISTRICT 69
SIUSLAW SCHOOL DISTRICT
SWEET HOME SCHOOL DISTRICT NO.55
LINN CO. SCHOOL DIST. 95C - SCIO SD
ONTARIO MIDDLE SCHOOL
GERVAIS SCHOOL DIST. #1
NORTH SANTIAM SCHOOL DISTRICT 29J

JEFFERSON SCHOOL DISTRICT
SALEM-KEIZER PUBLIC SCHOOLS
MT. ANGEL SCHOOL DISTRICT NO.91
MARION COUNTY SCHOOL DISTRICT 103 - WASHINGTON ES
MORROW COUNTY SCHOOL DISTRICT
MULTNOMAH EDUCATION SERVICE DISTRICT
GRESHAM-BARLOW SCHOOL DISTRICT
DALLAS SCHOOL DISTRICT NO. 2
CENTRAL SCHOOL DISTRICT 13J
St. Mary Catholic School
CROSSROADS CHRISTIAN SCHOOL
ST. ANTHONY SCHOOL
HERITAGE CHRISTIAN SCHOOL
BEND-LA PINE SCHOOL DISTRICT
GLENDALE SCHOOL DISTRICT
LINCOLN COUNTY SCHOOL DISTRICT
PORTLAND PUBLIC SCHOOLS
REYNOLDS SCHOOL DISTRICT
CENTENNIAL SCHOOL DISTRICT
NOBEL LEARNING COMMUNITIES
St. Stephen's Academy
Salem-Keizer 24J
McKay High School
Pine Eagle Charter School
Waldo Middle School
hermiston school district
Clear Creek Middle School
Marist High School
Victory Academy
Vale School District No. 84
St. Mary School
Junction City High School
Three Rivers School District
Fern Ridge School District
JESUIT HIGH SCHL EXEC OFC
LASALLE HIGH SCHOOL
Southwest Christian School
Willamette Christian School
Westside Christian High School
CS LEWIS ACADEMY
Portland America School
Forest Hills Lutheran School
Mosier Community School
Koreducators Lep High
Warrenton Hammond School District
Sutherlin School District
Malheur Elementary School District
Ontario School District
Parkrose School District 3
Riverdale School District 51J
Tillamook School District
Madeleine School
Union School District
Helix School District
Molalla River jSchool District
Corvallis School District 509J
Falls City School District #57
Portland Christian Schools
LUCKIAMUTE VALLEY CHARTER SCHOOLS
Deer Creek Elementary School
Yamhill Carlton School District
HARRISBURG SCHL DIST
CENTRAL CURRY SCHL DIST#1
BNAI BRITH CAMP
OREGON FOOD BANK
ABIQUA SCHL
Salem keizar school district
Athena Weston School District 29RJ
Imbler School District #11
monument school
PENDLETON SCHOOL DISTRICT #16R
Ohara Catholic School
St. Paul School District
St Paul Parish School
EagleRidge High School
Grant Community School
Northwest Academy
Sunny Wolf Charter School
MCKENZIE SCHOOL DISTRICT 068
L'Etoiile French Immersion School
LA GRANDE SCHOOL DISTRICT 001
Marist Catholic High School
Elgin school dist.
PLEASANT HILL SCH DIST #1
Ukiah School District 80R
North Powder Charter School
French American School
Mastery Learning Institute
North Lake School District 14
Early College High School

Account Type: County **(46 records)**

GILLIAM COUNTY OREGON

HOUSING AUTHORITY OF CLACKAMAS COUNTY
UMATILLA COUNTY, OREGON
MULTNOMAH LAW LIBRARY
clackamas county
CLATSOP COUNTY
COLUMBIA COUNTY, OREGON
coos county
CROOK COUNTY ROAD DEPARTMENT
CURRY COUNTY OREGON
DESCHUTES COUNTY
GILLIAM COUNTY
GRANT COUNTY, OREGON
HARNEY COUNTY SHERIFFS OFFICE
HOOD RIVER COUNTY
jackson county
josephine county
klamath county
LANE COUNTY
LINN COUNTY
MARION COUNTY , SALEM, OREGON
MULTNOMAH COUNTY
SHERMAN COUNTY
WASCO COUNTY
YAMHILL COUNTY
WALLOWA COUNTY
ASSOCIATION OF OREGON COUNTIES
NAMI LANE COUNTY
BENTON COUNTY
DOUGLAS COUNTY
JEFFERSON COUNTY
LAKE COUNTY
LINCOLN COUNTY
POLK COUNTY
UNION COUNTY
WASHINGTON COUNTY
MORROW COUNTY
NORCOR Juvenile Detention
Tillamook County Estuary
Job Council
BAKER CNTY GOVT
TILLAMOOK CNTY
Wheeler County
Lane County Sheriff's Office
Clackamas County Juvenile Dept
City of Seaside Police Department

Account Type: Non-Profit **(563 records)**

Tamarack Aquatic Center
Seven Feathers Casino
St Paul Baptist Church
Long Tom Watershed Council
San Martin Deporres Catholic Church
Portland Parks Foundation
Cedar Hills Baptist Church
Unitarian Universalist Church in Eugene
Emmanuel Bible Church
Oregon Farm Bureau
Mt Emily Safe Center
Salem First Presbyterian Church
Rolling Hills Baptist Church
Baker Elks
Gates Community Church of Christ
PIP Corps LLC
Turtle Ridge Wildlife Center
Grande Ronde Model Watershed Foundation
Western Environmental Law Center
Mercy Flights, Inc.
The Christian Church of Hillsboro Oregonb
HHoly Trinity Greek Orthodox Cathedral
MECOP Inc.
Beaverton Christians Church
Oregon Humanities
St. Pius X School
Community Connection of Northeast Oregon, Inc.
St Mark Presbyterian Church
Living Opportunities, Inc.
Coos Art Museum
OETC
Blanchet House of Hospitality
Merchants Exchange of Portland, Oregon
Coalition for a Livable Future
Central Oregon Visitors Association
Soroptimist International of Gold Beach, OR
Real Life Christian Church
Dayton Christian Church
Delphian School
AVON
EPUD-Emerald People's Utility District
Human Solutions, Inc.
The Wallace Medical Concern
Boys & Girls Club of Salem, Marion & Polk Counties
The Ross Ragland Theater and Cultural Center
Cascade Health Solutions

Umpqua Community Health Center
ALZHEIMERS NETWORK OF OREGON
NATIONAL WILD TURKEY FEDERATION
TILLAMOOK ESTUARIES PARTNERSHIP
LIFEWORKS NW
COLLEGE HOUSING NORTHWEST
PARALYZED VETERANS OF AMERICA
Independent Development Enterprise Alliance
MID-WILLAMETTE VALLEY COMMUNITY ACTION AGENCY, INC
HALFWAY HOUSE SERVICES, INC.
REDMOND PROFICIENCY ACADEMY
OHSU FOUNDATION
SHELTERCARE
PRINGLE CREEK SUSTAINABLE LIVING CENTER
PACIFIC INSTITUTES FOR RESEARCH
Mental Health for Children, Inc.
The Dreaming Zebra Foundation
LAUREL HILL CENTER
THE OREGON COMMUNITY FOUNDATION
OCHIN
WE CARE OREGON
SE WORKS
ENTERPRISE FOR EMPLOYMENT AND EDUCATION
OMNIMEDIX INSTITUTE
PORTLAND BUSINESS ALLIANCE
GATEWAY TO COLLEGE NATIONAL NETWORK
FOUNDATIONS FOR A BETTER OREGON
GOAL ONE COALITION
ATHENA LIBRARY FRIENDS ASSOCIATION
Coastal Family Health Center
CENTER FOR COMMUNITY CHANGE
STAND FOR CHILDREN
ST. VINCENT DEPAUL OF LANE COUNTY
EAST SIDE FOURSQUARE CHURCH
CORVALLIS MOUNTAIN RESCUE UNIT
InventSuccess
SHERIDAN JAPANESE SCHOOL FOUNDATION
The Blosser Center for Dyslexia Resources
MOSAIC CHURCH
HOUSING AUTHORITY OF LINCOLN COUNTY
RENEWABLE NORTHWEST PROJECT
INTERNATIONAL SUSTAINABLE DEVELOPMENT FOUNDATION
CONSERVATION BIOLOGY INSTITUTE
THE NATIONAL ASSOCIATION OF CREDIT MANAGEMENT-OREGON, INC.
BLACHLY LANE ELECTRIC COOPERATIVE
MORNING STAR MISSIONARY BAPTIST CHURCH
NORTHWEST FOOD PROCESSORS ASSOCIATION
INDEPENDENT INSURANCE AGENTS AND BROKERS OF OREGON
OREGON EDUCATION ASSOCIATION
HEARING AND SPEECH INSTITUTE INC
SALEM ELECTRIC
MORRISON CHILD AND FAMILY SERVICES
JUNIOR ACHIEVEMENT
CENTRAL BIBLE CHURCH
MID COLUMBIA MEDICAL CENTER-GREAT 'N SMALL
TRILLIUM FAMILY SERVICES, INC.
YWCA SALEM
PORTLAND ART MUSEUM
SAINT JAMES CATHOLIC CHURCH
SOUTHERN OREGON HUMANE SOCIETY
VOLUNTEERS OF AMERICA OREGON
CENTRAL DOUGLAS COUNTY FAMILY YMCA
METROPOLITAN FAMILY SERVICE
OREGON MUSUEM OF SCIENCE AND INDUSTRY
FIRST UNITARIAN CHURCH
ST. ANTHONY CHURCH
Good Shepherd Medical Center
Salem Academy
GEN CONF OF SDA CHURCH WESTERN OR
PORTLAND ADVENTIST ACADEMY
ST VINCENT DE PAUL
OUTSIDE IN
UNITED CEREBRAL PALSY OF OR AND SW WA
WILLAMETTE VIEW INC.
PORTLAND HABILITATION CENTER, INC.
OREGON STATE UNIVERSITY ALUMNI ASSOCIATION
Rose Villa
NORTHWEST LINE JOINT APPRENTICESHIP & TRAINING COMMITTEE
BOYS AND GIRLS CLUBS OF PORTLAND METROPOLITAN AREA
Oregon Research Institute
WILLAMETTE LUTHERAN HOMES, INC
LANE MEMORIAL BLOOD BANK
PORTLAND JEWISH ACADEMY
LANECO FEDERAL CREDIT UNION
GRANT PARK CHURCH
ST. MARYS OF MEDFORD, INC.
US CONFERENCE OF MENONNITE BRETHREN CHURCHES

FAITHFUL SAVIOR MINISTRIES
OREGON CITY CHURCH OF THE NAZARENE
OREGON COAST COMMUNITY ACTION
EDUCATION NORTHWEST
COMMUNITY ACTION TEAM, INC.
EUGENE SYMPHONY ASSOCIATION, INC.
STAR OF HOPE ACTIVITY CENTER INC.
SPARC ENTERPRISES
SOUTHERN OREGON CHILD AND FAMILY COUNCIL, INC.
SALEM ALLIANCE CHURCH
Lane Council of Governments
FORD FAMILY FOUNDATION
TRAILS CLUB
NEWBERG FRIENDS CHURCH
WOODBURN AREA CHAMBER OF COMMERCE
CONTEMPORARY CRAFTS MUSEUM AND GALLERY
CITY BIBLE CHURCH
OREGON LIONS SIGHT & HEARING FOUNDATION
PORTLAND WOMENS CRISIS LINE
THE SALVATION ARMY - CASCADE DIVISION
WILLAMETTE FAMILY
WHITE BIRD CLINIC
GOODWILL INDUSTRIES OF LANE AND SOUTH COAST COUNTIES
PLANNED PARENTHOOD OF SOUTHWESTERN OREGON
HOUSING NORTHWEST
OREGON ENVIRONMENTAL COUNCIL
MEALS ON WHEELS PEOPLE, INC.
FAITH CENTER
Bob Belloni Ranch, Inc.
GOOD SHEPHERD COMMUNITIES
SACRED HEART CATHOLIC DAUGHTERS
HELP NOW! ADVOCACY CENTER
TENAS ILLAHEE CHILDCARE CENTER
SUNRISE ENTERPRISES
LOOKING GLASS YOUTH AND FAMILY SERVICES
SERENITY LANE
EAST HILL CHURCH
LA GRANDE UNITED METHODIST CHURCH
COAST REHABILITATION SERVICES
Edwards Center Inc
ALVORD-TAYLOR INDEPENDENT LIVING SERVICES
NEW HOPE COMMUNITY CHURCH
KLAMATH HOUSING AUTHORITY
QUADRIPLEGICS UNITED AGAINST DEPENDENCY, INC.
SPONSORS, INC.
COLUMBIA COMMUNITY MENTAL HEALTH
ADDICTIONS RECOVERY CENTER, INC
METRO HOME SAFETY REPAIR PROGRAM
OREGON SUPPORTED LIVING PROGRAM
SOUTH COAST HOSPICE, INC.
ALLFOURONE/CRESTVIEW CONFERENCE CTR.
The International School
REBUILDING TOGETHER - PORTLAND INC.
PENDLETON ACADEMIES
PACIFIC FISHERY MANAGEMENT COUNCIL
DOGS FOR THE DEAF, INC.
PUBLIC DEFENDER SERVICES OF LANE COUNTY, INC.
EMMAUS CHRISTIAN SCHOOL
DELIGHT VALLEY CHURCH OF CHRIST
SAINT CATHERINE OF SIENA CHURCH
PORT CITY DEVELOPMENT CENTER
VIRGINIA GARCIA MEMORIAL HEALTH CENTER
CENTRAL CITY CONCERN
CANBY FOURSQUARE CHURCH
EMERALD PUD
VERMONT HILLS FAMILY LIFE CENTER
BENTON HOSPICE SERVICE
INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION
COMMUNITY CANCER CENTER
OPEN MEADOW ALTERNATIVE SCHOOLS, INC.
CASCADIA BEHAVIORAL HEALTHCARE
WILD SALMON CENTER
BROAD BASE PROGRAMS INC.
SUNNYSIDE FOURSQUARE CHURCH
TRAINING EMPLOYMENT CONSORTIUM
RELEVANT LIFE CHURCH
211INFO
SONRISE CHURCH
LIVING WAY FELLOWSHIP
Women's Safety & Resource Center
SEXUAL ASSAULT RESOURCE CENTER
IRCO
NORTHWEST YOUTH CORPS
TILLAMOOK CNTY WOMENS CRISIS CENTER
SECURITY FIRST CHILD DEVELOPMENT CENTER
CLASSROOM LAW PROJECT
YOUTH GUIDANCE ASSOC.
PREGNANCY RESOUCE CENTERS OF GRETER

PORTLAND
ELMIRA CHURCH OF CHRIST
JASPER MOUNTAIN
ACUMENTRA HEALTH
WORKSYSTEMS INC
COVENANT CHRISTIAN HOOD RIVER
OREGON DONOR PROGRAM
NAMI OREGON
OLIVET BAPTIST CHURCH
SILVERTON AREA COMMUNITY AID
CONFEDERATED TRIBES OF GRAND RONDE
NEIGHBORIMPACT
CATHOLIC COMMUNITY SERVICES
NEW AVENUES FOR YOUTH INC
LA CLINICA DEL CARINO FAMILY HEALTH CARE CENTER
DECISION SCIENCE RESEARCH INSTITUTE, INC.
WESTERN STATES CENTER
HIV ALLIANCE, INC
PARTNERSHIPS IN COMMUNITY LIVING, INC.
FANCONI ANEMIA RESEARCH FUND INC.
BLIND ENTERPRISES OF OREGON
OREGON BALLET THEATRE
SMART
All God's Children International
FARMWORKER HOUISNG DEV CORP
UMPQUA COMMUNITY DEVELOPMENT CORPORATION
REGIONAL ARTS AND CULTURE COUNCIL
THE EARLY EDUCATION PROGRAM, INC.
MACDONALD CENTER
EVERGREEN AVIATION MUSEUM AND CAP. MICHAEL KING.
SELF ENHANCEMENT INC.
FRIENDS OF THE CHILDREN
SOUTH LANE FAMILY NURSERY DBA FAMILY RELIEF NURSE
COMMUNITY VETERINARY CENTER
PORTLAND SCHOOLS FOUNDATION
SUSTAINABLE NORTHWEST
OREGON DEATH WITH DIGNITY
BIRCH COMMUNITY SERVICES, INC.
BAY AREA FIRST STEP, INC.
OSLC COMMUNITY PROGRAMS
EN AVANT, INC.
ASHLAND COMMUNITY HOSPITAL
NORTHWEST ENERGY EFFICIENCY ALLIANCE
BONNEVILLE ENVIRONMENTAL FOUNDATION
SUMMIT VIEW COVENANT CHURCH
SALMON-SAFE INC.
BETHEL CHURCH OF GOD
PROVIDENCE HOOD RIVER MEMORIAL HOSPITAL
SAINT ANDREW NATIVITY SCHOOL
BARLOW YOUTH FOOTBALL
SPOTLIGHT THEATRE OF PLEASANT HILL
FAMILIES FIRST OF GRANT COUNTY, INC.
TOUCHSTONE PARENT ORGANIZATION
CANCER CARE RESOURCES
CASCADIA REGION GREEN BUILDING COUNCIL
SHERMAN DEVELOPMENT LEAGUE, INC.
SCIENCEWORKS
WORD OF LIFE COMMUNITY CHURCH
SOCIAL VENTURE PARTNERS PORTLAND
OREGON PROGRESS FORUM
CENTER FOR RESEARCH TO PRACTICE
WESTERN RIVERS CONSERVANCY
UNITED WAY OF THE COLUMBIA WILLAMETTE
EUGENE BALLET COMPANY
EAST WEST MINISTRIES INTERNATIONAL
SISKIYOU INITIATIVE
EDUCATIONAL POLICY IMPROVEMENT CENTER
North Pacific District of Foursquare Churches
CATHOLIC CHARITIES
FIRST CHURCH OF THE NAZARENE
WESTSIDE BAPTIST CHURCH
Housing Development Center
Little Promises Chlildren's Program
UNION GOSPEL MISSION
GRACE BAPTIST CHURCH
COMMUNITY ACTION ORGANIZATION
OUTSIDE IN
MAKING MEMORIES BREAST CANCER FOUNDATION, INC.
ELAW
COMMUNITY HEALTH CENTER, INC
Greater Portland INC
Boys & Girls Club of Corvallis
Southeast Uplift Neighborhood Coalition
First United Presbyterian Church
PDX Wildlife
Jackson-Josephine 4-C Council
North Coast Family Fellowship
Childswork Learning Center
New Artists Performing Arts Productions, Inc.
Relief Nursery

St. Mary's Episcopal Church
Viking Sal Senior Center
Boys and Girls Club of the rogue valley
DrupalCon Inc., DBA Drupal Association
Albany Partnership for Housing and Community Development
Hermiston Christian Center & School
Dress for Success Oregon
Beaverton Rock Creek Foursquare Church
St Paul Catholic Church
St Mary's Catholic School and Parish
Polk Soil and Water Conservation District
Street Ministry
La Grande Church of the Nazarene
Spruce Villa, Inc.
House of Prayer for All Nations
Sacred Heart Catholic Church
African American Health Coaliton, Inc.
Happy Canyon Company
Village Home Education Resource Center
Monet's Children's Circle
Cascade Housing Association
Dayspring Fellowship
Northwest Habitat Institute
Winding Waters Medical Clinic
First Baptist Church
The Nature Conservancy, Willamette Valley Field Office
Serenity Lane Health Services
Portland Community Reinvestment Initiatives, Inc.
GeerCrest Farm & Historical Society
College United Methodist Church
NEDCO
Salem Evangelical Church
Daystar Education, Inc.
Oregon Social Learning Center
Pain Society of Oregon
environmental law alliance worldwide
Community in Action
Safe Harbors
FIRST CHRISTIAN CHURCH
Pacific Classical Ballet
Depaul Industries
African American Health Coalition
Jesus Prayer Book
Coalition Of Community Health
River Network
CCI Enterprises Inc
Oregon Nurses Association
GOODWILL INDUSTRIES OF THE COLUMBIA WILLAMETTE
Mount Angel Abbey
YMCA OF ASHLAND
YMCA OF COLUMBIA-WILLAMETTE ASSOCIATION SERVICES
Multnomah Law Library
Friends Of Tryon Creek State P
Ontrack Inc.
Calvin Presbyterian Church
HOLT INTL CHILD
St John The Baptist Catholic
Portland Foursquare Church
Portland Christian Center
Church Extension Plan
Occu Afghanistan Relief Effort
EUGENE FAMILY YMCA
Christ The King Parish and School
Newberg Christian Church
First United Methodist Church
Zion Lutheran Church
Southwest Bible Church
Community Works Inc
Masonic Lodge Pearl 66
Molalla Nazarene Church
Transition Projects, Inc
St Michaels Episcopal Church
Saint Johns Catholich Church
Access Inc
Community Learning Center
Old Mill Center for Children and Families
Sunny Oaks Inc
Hospice Center Bend La Pine
Westside Foursquare Church
Relief Nursery Inc
Morning Star Community Church
MULTNOMAH DEFENDERS INC
Providence Health System
Holy Trinity Catholic Church
Holy Redeemer Catholic Church
Alliance Bible Church
CARE OREGON
Mid Columbia Childrens Council
HUMANE SOCIETY OF REDMOND
Our Redeemer Lutheran Church
Kbps Public Radio

Skyball Salem Keizer Youth Bas
Open Technology Center
Grace Chapel
CHILDREN'S MUSEUM 2ND
Solid Rock
West Chehalem Friends Church
Guide Dogs For The Blind
Aldersgate Camps and Retreats
St. Katherine's Catholic Church
The Alliance NW of the Christian & Missionary Alliance
Bags of Love
Grand View Baptist Church
Green Electronics Council
Scottish Rite
Western Wood Products Association
THE NEXT DOOR
NATIONAL PSORIASIS FOUNDATION
NEW BEGINNINGS CHRISTIAN CENTER
HIGHLAND UNITED CHURCH OF CHRIST
OREGON REPERTORY SINGERS
HIGHLAND HAVEN
FAIR SHARE RESEARCH AND EDUCATION FUND
Oregon Satsang Society, Inc., A chartered Affiliate of ECKANKAR , ECKA
First Baptist Church of Enterprise
The Canby Center
Instituto de Cultura y Arte In Xochitl In Cuicatl
OSLC COMMUNITY PROGRAMS OCP
Oregon Nikkei Endowment
Eastern Oregon Alcoholism Foundation
Grantmakers for Education
The Spiral Gallery
The ALS Association Oregon and SW Washington Chapter
Children's Relief Nursery
Home Builders
World of Speed
SW Community Health Center
Energy Trust of Oregon
St. Vincent de Paul Church
Fr. Bernard Youth Center
Oregon Psychoanalytic Center
Store to Door
Depaul Industries
North Coast Christian Church
Union County Economic Development Corp.
Camelto Theatre Company
Camp Fire Columbia
TAKE III OUTREACH
Rolling Hills Community Church
Summa Institute
Amani Center
Billy Webb Elks lodge #1050
Sandy Seventh-day Adventist Church
Muddy Creek Charter School
A FAMILY FOR EVERY CHILD
1000 FRIENDS OF OREGON
NONPROFIT ASSOCIATION OF OREGON
FAMILY CARE INC
MEDICAL TEAMS INTL
Clean Slate Canine Rescue & Rehabilitation
St. Martins Episcopal church
Food for Lane County
columbia gorge discovery center and museum
NAMI of Washington County
The Dalles Art Association
Temple Beth Israel
Willamette Leadership Academy/Pioneer Youth Corps Of Oregon
Rose Haven
Sexual Assault Support Services
The Inn Home for Boys, Inc.9138
Oregon Technical Assistance Corporation
Education Travel & Culture, Inc.
Rural Development Initiatives
Jason Lee Manor/UMRC
YMCA of Marion and Polk Counties
Faith Christian Fellowship
Brookings Elks Lodge
Fund For Christian Charity
Deer Meadow Assisted Living
Umpqua Basin Water Association
The Church of Christ of Latter Day Saints
300 Main Inc
Southwestern Oregon Public Defender Services, Inc.
Albertina Kerr Centers
Dufur Christian Church
St. Matthew Catholic School
Serendipity Center Inc
Northwest Family Services
Network Charter School
Ride Connecton
Parenting Now!
USO Northwest

Norkenzie Christian Church
Evergreen Wings and Waves
Ascension Episcopal Parish
Center for Family Development
West Salem Foursquare Church
Mount Pisgah Arboretum
Lower Columbia Estuary Partnership
Oasis Shelter Home
Nehalem Bay House
p:ear
Health Share of Oregon
St. Peter Catholic Church
Mid Willamette Valley Community Action
A Hope For Autism Foundation
Breast Friends
SEPTL Southeast Portland Tool Library
National Christian Community Foundation
Legal Aid Services of Oregon LITC
Willamette Valley Babe Ruth
Center For Continuous Improvement
SEIU Local 49
Emerald Media Group
Trillium Sprigs
Youth Dynamics
Ashland Art Center
Apostolic Church of Jesus Christ
DOUGLAS FOREST PROTECTIVE
Oregon Lyme Disease Network
Ecotrust
SPECIAL MOBILITY SERVICES
Historical Outreach Foundation
Teras Interventions and Counseling Inc
Salem Area Chamber of Commerce
First Congregational Chrch
OREGON STATE FAIR
Ronald McDonald House Charities of Oregon & Southwest Washington
Center for Human Development
Bridges to Change
DePaul Treatment Centers, Inc.
Mission Increase Foundation
Curry Public Transit Inc
THREE RIVERS CASINO
Brookings Harbor Christian School
Yamhill Community Care Organization
Portland Japanese Garden
The Madeleine Parish
The Tucker-Maxon Oral School
Southwest Neighborhoods, Inc
Wallowa Valley Center For Wellness
KIDS INTERVENTION AND DIAGNOSTIC CENTER
Portland Yacht Club
League of Women Voters
United Way of Lane County
Unithed Way
Portland Oregon Visitors Association
Southern Oregon Project Hope
Our United Villages
Samaritan Health Services Inc.
Kilchis House
Calvary Assembly of God
Lake Grove Presbyterian Church
Grace Lutheran School
Western Mennonite School
OEA CHOICE TRUST
American Tinnitus Association
Oregon Coast Aquarium, Inc.
Unitus Community Credit Union
St John the Baptist Greek Orthodox Church
COLUMBIA PACIFIC ECONOMIC DEVELOPMENT DISTRICT OF OREGON
Oregon Rural Electric Cooperative Association
THE MILL CASINO

Account Type: College and University **(32 records)**

Oregon State University
Treasure Valley Community College
Unviersity of Oregon
OREGON UNIVERSITY SYSTEM
WESTERN STATES CHIROPRACTIC COLLEGE
GEORGE FOX UNIVERSITY
LEWIS AND CLARK COLLEGE
PACIFIC UNIVERSITY
REED COLLEGE
WILLAMETTE UNIVERSITY
LINFIELD COLLEGE
MULTNOMAH BIBLE COLLEGE
NORTHWEST CHRISTIAN COLLEGE
NATIONAL COLLEGE OF NATURAL MEDICINE
BLUE MOUNTAIN COMMUNITY COLLEGE
PORTLAND STATE UNIV.
CLACKAMAS COMMUNITY COLLEGE
MARYLHURST UNIVERSITY
OREGON HEALTH AND SCIENCE UNIVERSITY

BIRTHINGWAY COLLEGE OF MIDWIFERY
pacific u
UNIVERSITY OF OREGON
CONCORDIA UNIV
Marylhurst University
Corban College
UNIVERSITY OF PORTLAND
Portland Actors Conservatory
University Of Oregon Athletics Department
Ecola Bible School
Beta Omega Alumnae
Oregon Institute of Technology
EASTERN OREGON UNIVERSITY

Account Type: Other **(51 records)**

Clackamas River Water Providers
eickhoff dev co inc
The Klamath Tribe
Cannon Beach Fire
Life Flight Network LLC
COVENANT RETIREMENT COMMUNITIES
PENTAGON FEDERAL CREDIT UNION
SAIF CORPORATION
GREATER HILLSBORO AREA CHAMBER OF COMMERCE
LANE ELECTRIC COOPERATIVE
USAGENCIES CREDIT UNION
DOUGLAS ELECTRIC COOPERATIVE, INC.
ROGUE FEDERAL CREDIT UNION
PACIFIC CASCADE FEDERAL CREDIT UNION
LOCAL GOVERNMENT PERSONNEL INSTITUTE
GRANTS PASS MANAGEMENT SERVICES, DBA
SPIRIT WIRELESS
Kartini Clinic
OFFICE OF PUBLIC DEFENSE SERVICES
Clatskanie People's Utility District
MARION COUNTY HEALTH DEPT
Ricoh USA
Heartfelt Obstetrics & Gynecology
Coquille Economic Development Corporation
Cintas
CITY/COUNTY INSURANCE SERVICE
COMMUNITY CYCLING CENTER
Shangri La
Portland Impact
Eagle Fern Camp
KLAMATH FAMILY HEAD START
RIVER CITY DANCERS
Oregon Permit Technical Association
KEIZER EAGLES AERIE 3895
Pgma/Cathie Bourne
Sunrise Water
Burns Paiute Tribe
Oregon Public Broadcasting
La Grande Family Practice
SELCO Community Credit Union
Sphere MD
sunrise water authority
OREGON JUDICIAL DEPARTMENT
Confederated Tribes of Warm Springs
Halsey-Shedd Fire District
Nez Perce Tribe
Obsidian Urgent Care, P.C.
First Presbyterian Church of La Grande
CONFLUENCE ENVIRONMENTAL CENTE
A&I Benefit Plan Administrators, Inc.
crescent grove cemetery

Account Type: City Special District **(19 records)**

Molalla Rural Fire Protection District
MONMOUTH - INDEPENDENCE NETWORK
MALIN COMMUNITY PARK AND RECREATION DISTRICT
TILLAMOOK PEOPLES UTILITY DISTRICT
GLADSTONE POLICE DEPARTMENT
GOLD BEACH POLICE DEPARTMENT
THE NEWPORT PARK AND RECREATION CENTER
RIVERGROVE WATER DISTRICT
WEST VALLEY HOUSING AUTHORITY
TUALATIN VALLEY FIRE & RESCUE
GASTON RURAL FIRE DEPARTMENT
CITY COUNTY INSURANCE SERVICES
METRO
SUNSET EMPIRE PARK AND RECREATION
SPRINGFIELD UTILITY BOARD
Tillamook Urban Renewal Agency
Netarts Water District
City of Nehalem
Boardman Rural Fire Protection District

Account Type: Independent Special District **(47 records)**

Silverton Fire District
Lewis and Clark Rural Fire Protection District

Rainbow Water District
Illinois Valley Fire District
PORT OF TILLAMOOK BAY
TRI-COUNTY HEALTH CARE SAFETY NET ENTERPRISE
METROPOLITAN EXPOSITION-RECREATION COMMISSION
REGIONAL AUTOMATED INFORMATION NETWORK
OAK LODGE WATER DISTRICT
THE PORT OF PORTLAND
WILLAMALANE PARK AND RECREATION DISTRICT
TUALATIN VALLEY WATER DISTRICT
UNION SOIL & WATER CONSERVATION DISTRICT
LANE EDUCATION SERVICE DISTRICT
TUALATIN HILLS PARK AND RECREATION DISTRICT
PORT OF SIUSLAW
CHEHALEM PARK AND RECREATION DISTRICT
PORT OF ST HELENS
LANE TRANSIT DISTRICT
CENTRAL OREGON INTERGOVERNMENTAL COUNCIL
HOODLAND FIRE DISTRICT NO.74
MID COLUMBIA COUNCIL OF GOVERNMENTS
WEST MULTNOMAH SOIL AND WATER CONSERVATION DISTRICT
SALEM AREA MASS TRANSIT DISTRICT
Banks Fire District #13
KLAMATH COUNTY 9-1-1
GLENDALE RURAL FIRE DISTRICT
COLUMBIA 911 COMMUNICATIONS DISTRICT
CLACKAMAS RIVER WATER
NW POWER POOL
Lowell Rural Fire Protection District
TriMet Transit
Estacada Rural Fire District
Keizer Fire District
State Accident Insurance Fund Corporation
Bend Metro Park & Recreation District
Port of Hood River
La Pine Park & Recreation District
Siuslaw Public Library District
Columbia River Fire & Rescue
Fern Ridge Library District
Seal Rock Water District
Rockwood Water P.U.D.
Tillamook Fire District
Tillamook County Transportation Dist
Central Lincoln People's Utility District
Jefferson Park and Recreation

Account Type: City **(146 records)**

City of Monmouth / Public Works
McMinnville Police Department
City of Sublimity
City of Central Point Parks and Recreation
Gearhart Fire Department
Brookings Fire / Rescue
City of Veneta
CITY OF DAMASCUS
Hermiston Fire & Emergency Svcs
CEDAR MILL COMMUNITY LIBRARY
CITY OF LAKE OSWEGO
EUGENE WATER & ELECTRIC BOARD
LEAGUE OF OREGON CITIES
CITY OF SANDY
CITY OF ASTORIA OREGON
CITY OF BEAVERTON
CITY OF BOARDMAN
CITY OF CANBY
CITY OF CANYONVILLE
CITY OF CENTRAL POINT POLICE DEPARTMENT
CITY OF CLATSKANIE
CITY OF CONDON
CITY OF COOS BAY
CITY OF CORVALLIS
CITY OF CRESWELL
CITY OF ECHO
CITY OF ESTACADA
CITY OF EUGENE
CITY OF FAIRVIEW
CITY OF GEARHART
CITY OF GOLD HILL
CITY OF GRANTS PASS
CITY OF GRESHAM
CITY OF HILLSBORO
CITY OF HOOD RIVER
CITY OF JOHN DAY
CITY OF KLAMATH FALLS
CITY OF LA GRANDE
CITY OF MALIN
CITY OF MCMINNVILLE
CITY OF HALSEY
CITY OF MEDFORD

CITY OF MILL CITY
CITY OF MILWAUKIE
CITY OF MORO
CITY OF MOSIER
CITY OF NEWBERG
CITY OF OREGON CITY
CITY OF PILOT ROCK
CITY OF POWERS
RAINIER POLICE DEPARTMENT
CITY OF REEDSPORT
CITY OF RIDDLE
CITY OF SCAPPOOSE
CITY OF SEASIDE
CITY OF SILVERTON
CITY OF STAYTON
City of Troutdale
CITY OF TUALATIN, OREGON
CITY OF WARRENTON
CITY OF WEST LINN/PARKS
CITY OF WOODBURN
CITY OF TIGARD, OREGON
CITY OF AUMSVILLE
CITY OF PORT ORFORD
CITY OF EAGLE POINT
CITY OF WOOD VILLAGE
St. Helens, City of
CITY OF WINSTON
CITY OF COBURG
CITY OF NORTH PLAINS
CITY OF GERVAIS
CITY OF YACHATS
FLORENCE AREA CHAMBER OF COMMERCE
PORTLAND DEVELOPMENT COMMISSION
CITY OF CANNON BEACH OR
CITY OF ST. PAUL
CITY OF ADAIR VILLAGE
CITY OF WILSONVILLE
CITY OF HAPPY VALLEY
CITY OF SHADY COVE
CITY OF LAKESIDE
CITY OF MILLERSBURG
CITY OF GATES
KEIZER POLICE DEPARTMENT
CITY OF DUNDEE
CITY OF AURORA
THE CITY OF NEWPORT
CITY OF ALBANY
CITY OF ASHLAND
CITY OF LEBANON
CITY OF PORTLAND
CITY OF SALEM
CITY OF SPRINGFIELD
CITY OF BURNS
CITY OF COTTAGE GROVE
CITY OF DALLAS
CITY OF FALLS CITY
CITY OF PHOENIX
CITY OF PRAIRIE CITY
CITY OF REDMOND
CITY OF SHERWOOD
City of junction city
City of Florence
City of Dayton
City of Monmouth
City of Philomath
City of Sheridan
Seaside Public Library
City of Yoncalla
La Grande Police Department
Cove City Hall
NW PORTLAND INDIAN HEALTH BOARD
Portland Patrol Services
City Of Bend
City Of Coquille
City Of Molalla
ROCKWOOD WATER PEOPLE'S UTILITY DISTRICT
City of St. Helens
City of North Powder
City of Cornelius, OR
Toledo Police Department
City of Independence
City of Baker City
McMinnville Water & Light
City of Pendleton Parks & Recreation
CITY OF SWEETHOME
CITY OF THE DALLES
CLACKAMAS FIRE DIST#1
DESCHUTES PUBLIC LIBRARY
City of Ontario
City of Corvallis Parks and Recreation
North Lincoln Fire & Rescue #1
City of Harrisburg
Gladstone Public Library
Seaside Fire & Rescue

City of Union
City of Richland
CITY OF LINCOLN CITY
City of Donald
City of Milton-Freewater
CITY OF SCIO
City of Forest Grove
City Govrnment
City of Mt. Angel
Albany Police Department

Account Type: County Special District **(32 records)**

Umatilla Electric Cooperative
WATER ENVIRONMENT SERVICES
Polk County Fire District No.1
Netarts-Oceanside RFPD
UIUC
Rogue River Fire District
Aurora Rural FIre District
Tillamook County Emergency Communications District
Southern Coos Hospital
Oregon Cascades West Council of Governments
MULTONAH COUNTY DRAINAGE DISTRICT #1
PORT OF BANDON
OR INT'L PORT OF COOS BAY
MID-COLUMBIA CENTER FOR LIVING
DESCHUTES COUNTY RFPD NO.2
YOUNGS RIVER LEWIS AND CLARK WATER DISTRICT
PACIFIC STATES MARINE FISHERIES COMMISSION
HOUSING AUTHORITY AND COMMUNITY SERVICES AGENCY
CENTRAL OREGON IRRIGATION DISTRICT
MARION COUNTY FIRE DISTRCT #1
COLUMBIA RIVER PUD
SANDY FIRE DISTRICT NO. 72
BAY AREA HOSPITAL DISTRICT
NEAH KAH NIE WATER DISTRICT
PORT OF UMPQUA
EAST MULTNOMAH SOIL AND WATER CONSERVANCY
Benton Soil & Water Conservation District
DESCHUTES PUBLIC LIBRARY SYSTEM
North Douglas County Fire & EMS
Crooked River Ranch Rural Fire Protection District
PARROTT CREEK CHILD & FAM
South Lane County Fire And Rescue

Account Type: Community College **(13 records)**

CENTRAL OREGON COMMUNITY COLLEGE
LANE COMMUNITY COLLEGE
MT. HOOD COMMUNITY COLLEGE
LINN-BENTON COMMUNITY COLLEGE
SOUTHWESTERN OREGON COMMUNITY COLLEGE
PORTLAND COMMUNITY COLLEGE
CHEMEKETA COMMUNITY COLLEGE
COLUMBIA GORGE COMMUNITY COLLEGE
TILLAMOOK BAY COMMUNITY COLLEGE
KLAMATH COMMUNITY COLLEGE DISTRICT
Oregon Coast Community College
Clatsop Community College
North Portland Bible College

Account Type: State Agency **(40 records)**

Teacher Standards and Pracitices Commission
Oregon Forest Resources Institute
Office of the Ong Term Care Ombudsman
Oregon State Lottery
OREGON TOURISM COMMISSION
OREGON STATE POLICE
OFFICE OF THE STATE TREASURER
OREGON DEPT. OF EDUCATION
SEIU LOCAL 503, OPEU
OREGON DEPARTMENT OF FORESTRY
OREGON STATE DEPT OF CORRECTIONS
OREGON CHILD DEVELOPMENT COALITION
OFFICE OF MEDICAL ASSISTANCE PROGRAMS
OREGON OFFICE OF ENERGY
OREGON STATE BOARD OF NURSING
BOARD OF MEDICAL EXAMINERS
OREGON LOTTERY
OREGON BOARD OF ARCHITECTS
SANTIAM CANYON COMMUNICATION CENTER
OREGON DEPT OF TRANSPORTATION
OREGON TRAVEL INFORMATION COUNCIL
OREGON DEPARTMENT OF EDUCATION
OREGON DEPT. OF CORRECTIONS
DEPARTMENT OF ADMINISTRATIVE SERVICES
Oregon Board of Massage Therapists
Oregon Tradeswomen
Oregon Convention Center

OREGON SCHL BRDS ASSOCIAT

Central Oregon Home Health and Hos

Oregon Health Care Quality Cor

OREGON DEPARTMENT OF HUMAN SERVICES

Oregon Air National Guard

Training & Employment

BIENESTAR, INC.

State of Oregon - Department of Administrative Services

Aging and People with Disabilities

Procurement Services/DAS

STATE OF OREGON

City of Astoria Fire Department

Columbia Gorge ESD

Account Type: Consolidated City/County **(4 records)**

City of Carlton

City of Pendleton Convention Center

Nehalem Bay Wastewater

Association of Oregon Community Mental Health Programs

Account Type: Federal **(6 records)**

US FISH AND WILDLIFE SERVICE

Bonneville Power Administration

Oregon Army National Guard

USDA Forest Service

Yellowhawk Tribal Health Center

ANGELL JOB CORPS

Account Type: Housing Authority **(7 records)**

Coquille Indian Housing Authority

HOUSING AUTHORITY OF PORTLAND

NORTH BEND CITY- COOS/URRY HOUSING AUTHORITY

MARION COUNTY HOUSING AUTHORITY

HOUSING AUTHORITY OF THE CITY OF SALEM

Housing Authority of Yamhill County

The Housing Authority of the County of Umatilla

FEMA STANDARD TERMS AND CONDITIONS ADDENDUM
FOR CONTRACTS AND GRANTS

If any purchase made under the Master Agreement is funded in whole or in part by Federal Emergency Management Agency ("FEMA") grants, Contractor shall comply with all federal laws and regulations applicable to the receipt of FEMA grants, including, but not limited to the contractual procedures set forth in Title 44 of the Code of Federal Regulations, Part 13 ("44 CFR 13").

In addition, Contractor agrees to the following specific provisions:

1. Pursuant to 44 CFR 13.36(i)(1), City is entitled to exercise all administrative, contractual, or other remedies permitted by law to enforce Contractor's compliance with the terms of this Master Agreement, including but not limited to those remedies set forth at 44 CFR 13.43.

2. Pursuant to 44 CFR 13.36(i)(2), City may terminate the Master Agreement for cause or convenience in accordance with the procedures set forth in the Master Agreement and those provided by 44 CFR 13.44.

3. Pursuant to 44 CFR 13.36(i)(3)-(6)(12), and (13), Contractor shall comply with the following federal laws:

a. Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor ("DOL") regulations (41 CFR Ch. 60);

b. Copeland "Anti-Kickback" Act (18 U.S.C. 874), as supplemented in DOL regulations (29 CFR Part 3);

c. Davis-Bacon Act (40 U.S.C. 276a-276a-7) as supplemented by DOL regulations (29 CFR Part 5);

d. Section 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by DOL regulations (29 CFR Part 5);

e. Section 306 of the Clean Air Act (42 U.S.C. 1857(h), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental
Protection Agency regulations (40 CFR part 15); and

f. Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

4. Pursuant to 44 CFR 13.36(i)(7), Contractor shall comply with FEMA requirements and regulations pertaining to reporting, including but not limited to those set forth at 44 CFR 40 and 41.

5. Pursuant to 44 CFR 13.36(i)(8), Contractor agrees to the following provisions regarding patents:

a. All rights to inventions and/or discoveries that arise or are developed, in the course of or under this Agreement, shall belong to the City and be disposed of in accordance with City policy. The City, at its own discretion, may file for patents in connection with all rights to any such inventions and/or discoveries.

6. Pursuant to 44 CFR 13.36(i)(9), Contractor agrees to the following provisions, regarding copyrights:

a. If this Agreement results in any copyrightable material or inventions, in accordance with 44 CFR 13.34, FEMA reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, for Federal Government purposes:

(1) The copyright in any work developed under a grant or contract; and
(2) Any rights of copyright to which a grantee or a contactor purchases ownership with grant support.

7. Pursuant to 44 CFR 13.36(i)(10), Contractor shall maintain any books, documents, papers, and records of the Contractor which are directly pertinent to this Master Agreement. At any time during normal business hours and as often as City deems necessary, Contractor shall permit City, FEMA, the Comptroller General of United States, or any of their duly authorized representatives to inspect and photocopy such records for the purpose of making audit, examination, excerpts, and transcriptions.

8. Pursuant to 44 CFR 13.36(i)(11), Contractor shall retain all required records for three years after FEMA or City makes final payments and all other pending matters are closed. In addition, Contractor shall comply with record retention requirements set forth in 44 CFR 13.42.

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COMMUNITY DEVELOPMENT BLOCK GRANT ADDENDUM

Purchases made under this contract may be partially or fully funded with federal grant funds. Funding for this work may include Federal Funding sources, including Community Development Block Grant (CDBG) funds from the U.S. Department of Housing and Urban Development. When such funding is provided, Contractor shall comply with all terms, conditions and requirements enumerated by the grant funding source, as well as requirements of the State statutes for which the contract is utilized, whichever is the more restrictive requirement. When using Federal Funding, Contractor shall comply with all wage and latest reporting provisions of the Federal Davis-Bacon Act. HUD-4010 Labor Provisions also applies to this contract.

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PART V – EVALUATION AND SELECTION PROCESS

1.0 EVALUATION SUMMARY:

1.1 An evaluation committee will evaluate responsive proposals and develop a short list of Proposer(s) based upon the initial review of each Proposal received. The short listed Proposer(s) may be scheduled for a structured oral presentation, demonstration and/or interview. Such presentations will be at no cost to the City of Houston. At the end of the oral presentation, demonstration and/or interview, the evaluation of the short listed Proposer(s) will be completed. However, the evaluation committee reserves the right to issue letter(s) of clarity when deemed necessary to any or all Proposer(s). The oral presentations, demonstrations and/or interviews may be recorded and/or videotaped. Price proposals will be considered for those proposers determined to have met the qualification & specification requirements.

Please refer Attachment "D" for price proposal for evaluation purposes.

2.0 SELECTION PROCESS:

The award of this contract(s) will be made to the Proposer(s) offering the Products and Services that best meet the needs of the City and Participating Public Agencies. The City may make investigations, as it deems necessary, to determine the capabilities of the Proposer(s) to create, modify and implement the required application modules. The Proposer(s) shall furnish to the City such data as the City may request for this purpose. The City reserves the right to reject any offer if the evidence submitted by or the investigation of the Proposer(s) fails to satisfy the City or the Proposer(s) is deemed unqualified to provide the services contemplated. Each Proposal will be evaluated on the basis of the following evaluation criteria:

2.1 Responsiveness to Proposal: The City will evaluate each Proposer's responsiveness to the Proposal's "Material" requirements within this RFP.

2.2 Technical Competence:

2.2.1 Quality of Proposed Equipment: Proposer's ability to provide a broad offering of one or more of the Product Categories, Specifications/Scope of Work to meet the various needs of Participating Public Agencies as provided in Part II, Scope of Work/Technical Specifications.

2.2.2 Qualifications and Experience: Proposer's extent and depth of relevant experience of the management team and the financial stability to successfully provide the Products and Services.

2.2.3 Quality of Strategy and Operational Plan: Proposer's demonstrated understanding of the Specifications/Scope of Work and its ability to meet or exceed said Specifications/Scope of Work, the overall strategy for implementation, qualified key personnel responsible for project completion, and rationale for products proposed.

2.2.4 National Program: Proposer's ability to successfully implement a nationwide program in all aspects required, as listed below:

2.2.4.1 Proposer's understanding and acceptance of the Supplier Commitments outlined in Part IV.

2.2.4.2 Proposer's positive response to the Supplier Worksheet for National Program Consideration.

2.2.4.3 Company Information: The ability of the Proposer to demonstrate its sales capability and experience in the marketplace nationally.

2.2.4.4 Distribution: The ability of the Proposer to distribute products nationally and its ability to do business with small or MWBE businesses as applicable.

2.2.4.5 Marketing: The ability of the Proposer to market and promote this contractual agreement to Participating Public Agencies nationwide.

2.2.4.6 Quality: The ability of the Proposer to demonstrate sound quality processes.

2.2.4.7 Administration: The ability of the Proposer to administer the contract nationwide.

2.2.4.8 National Staffing Plan: The ability of the Proposer to dedicate personnel for this contract nationally.

2.2.4.9 Sustainability: The ability of the Proposer to demonstrate sound sustainable policies, strategies and actions.

2.3 Price Proposal:

Based on Proposer's most competitive price submitted on Attachment D, Sample Specification Pricing, by Proposer meeting minimum requirements and while maximizing value to the program. Attachment D pricing must correspond to the product pricing proposed in Part XI, Price Sheet.

* Hire Houston First Preference Points (City Business = five (5) extra percentage points or Local Business = three (3) extra percentage points. Non-City and Non-Local Businesses will receive zero (0) extra percentage points.)

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PART VI – SUBMISSION OF PROPOSAL

A. Instructions for Submission

1. Number of Copies. Please submit **five (05)** copies of the Proposal, including one (1) printed original signed in BLUE ink, and additional ten (10) electronic thumb drives are to be submitted in a sealed envelope bearing the assigned Solicitation Number, located on the first page of the RFP document to:

   Chief Procurement Officer
   City Hall
   901 Bagby, Suite B300
   Houston, Texas 77002

   The City of Houston shall bear no responsibility for submitting responses on behalf of any Proposer. Proposer(s) may submit their Proposal to the Office of the Chief Procurement Officer any time prior to the stated deadline.

2. Time for submission. Proposals shall be submitted no later than the date and time indicated for submission in this RFP. Late submittals will not be considered and will be returned unopened.

3. Format. Proposal should be left-bound with information on both sides of the page when appropriate. Material should be organized following the order of the submission requirements separated by labeled tabs. Expensive paper and bindings are discouraged since no materials will be returned.

4. Complete submission. Proposers are advised to carefully review all the requirements and submit all documents and information as indicated in this RFP. Incomplete proposals may lead to a proposal being deemed non responsive. Non-responsive proposals will not be considered.

5. Packaging and Labeling. The outside wrapping/envelope shall clearly indicate the RFP Title and date and time for submission. It shall also indicate the name of the proposer. The Price Proposal shall be submitted in a separate sealed envelope. The envelope shall clearly identify the content as "Price Proposal" and must be submitted in a separate sealed envelope marked "PRICING". All other submission requirements shall be included with the Technical Proposal.

6. Timely delivery of Proposals. The Proposal, including the Technical Proposal, the Pricing Proposal and signed Contract, must be delivered by hand or sent to the City of Houston Chief Procurement Officer through U.S. Mail or other available courier services to the address shown on the cover sheet of this RFP. Include the RFP number on any package delivered or sent to the Chief Procurement Officer and on any correspondence related to the Proposal. If using an express delivery service, the package must be delivered to the designated building.

7. Late Proposals. The proposer remains responsible for ensuring that its Proposal is received at the time, date, place, and office specified. The City assumes no responsibility for any Proposal not so received, regardless of whether the delay is caused by the U.S. Postal Service, the courier delivery service, or some other act or circumstance.

B. Submission Requirements

1. Cover letter: The cover letter shall be signed by an authorized representative of the Proposer. The letter should indicate the Proposer's commitment to provide the services proposed. Also, the cover letter shall identify the members of the team that comprise the Proposer. Indicate the organizational relationship of the team members.

2. Executive Summary: The executive summary shall be a brief, concise summary level description of the contents of the proposal.

3. Quality and Product Summary: The detail of each Product summary should include a brief overview of the Product category based on requirements in Part II, Scope of Work/Technical Specifications. The warranty, life expectancy, delivery schedule, inspection and acceptance, training and any equipment recalls should incorporate for each product offered in product summary. The proposed training plan shall be described in sufficient detail so as to provide samples of material and content of training. Indicate the number of hours provided in Product summary.

4. Qualifications of the Proposer: Include a brief description of the organization's track record, including history, number of employees, number of years in business, and a list of projects relevant to this RFP. Provide a list of references where a similar solution was implemented. Include the name of the contact person, name of the organization, dollar value of the project, address, telephone number and email address. Please provide at least three (3) references. The City is primarily interested in clients with similar needs and comparable size.

5. Qualifications of Local Key Personnel: Provide chronological resumes of the key personnel that will be assigned to the project. Please provide at least three (3) references of projects where key personnel performed in a similar role as that proposed for this project.

6. Proposed Strategy and Operational Plan: The strategy and operational plan should include a brief overview of the proposed plan for the RFP requirements, an understanding of the work to be done, the overall strategy for implementation from selection of product through delivery and training, the key personnel who will be responsible for seeing the project through completion, and a rationale for proposing the products for implementation at the City. The strategy and operational plan shall also include the timeline for implementation and highlight any other requirements that are noted in the detailed proposed plan. Attach a proposed organization chart for the project. Also, please describe the proposed strategy to keep purchased products current as technology evolves and improves.

7. National Supplier Qualifications:

   6.1. Supplier Qualifications Section: Proposer must include a narrative of its understanding and acceptance of the Supplier Commitments outlined in Part IV.

   6.2. Provide completed and signed Supplier Worksheet for National Program Consideration in Part IV.

   6.3. Complete Supplier Information section of Part IV.

8. M/WBE Participation: Proposer shall identify the M/WBE participation level and the role that each M/WBE firm will have in the project implementation. Since M/WBEs proposed are considered part of the team, the Proposer shall include all relevant information necessary to effectively perform the evaluation of the proposal as it relates to the submission requirements listed in this section.

9. Financial Stability. Provide the audited financial statements or Federal Tax Forms Filed to the Internal Revenue Service (IRS) for the past two fiscal years. At a minimum, include the letter of opinion, balance sheet, schedules, and related auditor's notes.

10. U.S. Communities Administration Agreement: Provide the U.S. Communities Administration Agreement, signed, unaltered.

11. Legal Actions. Provide a list of any pending litigation and include a brief description of the reason for legal action.

12. Conflict of Interest. Provide information regarding any real or potential conflict of interest. Failure to address any potential conflict of interest upfront may be cause for rejection of the proposal. Please see Exhibit VI.

13. Other. Submit any information the Proposer deems pertinent to demonstrating its qualifications to perform the services being requested such as memberships in any professional associations, documents, examples, and others.

14. Forms and Certifications: Complete all forms and certifications attached, as appropriate.

15. Price Proposal: Please submit price proposal per Part XI of the RFP.

Part VII – SPECIAL CONDITIONS

A. No Contact Period

Neither Proposer(s) nor any person acting on Proposer(s)'s behalf shall attempt to influence the outcome of the award by the offer, presentation or promise of gratuities, favors, or anything of value to any appointed or elected official or employee of the City of Houston, their families or staff members. All inquiries regarding the solicitation are to be directed to the designated City Representative identified on the first page of the solicitation. Upon issuance of the solicitation through the pre-award phase and up to the date the City Secretary publicly posts notice of any City Council agenda containing the applicable award, aside from bidder's formal response to the solicitation, through the pre-award phase, written requests for clarification during the period officially designated for such purpose by the City Representative, neither Proposers(s) nor persons acting on their behalf shall communicate with any appointed or elected official or employee of the City of Houston, their families or staff through written or oral means in an attempt to persuade or influence the outcome of the award or to obtain or deliver information intended to or which could reasonably result in an advantage to any bidder. However, nothing in this paragraph shall prevent a bidder from making public statements to the City Council convened for a regularly scheduled session after the official selection has been made and placed on the City Council agenda for action, or to a City Council committee convened to discuss a recommendation regarding the solicitation.

B. Equal Opportunity Employment

The City of Houston Ordinance Section 15-17 establishes Equal Employment Opportunity Contract Compliance requirements for all City of Houston contracts involving the expenditure of Fifty Thousand Dollars ($50,000) or more. Any contract for professional services that results from this RFP will provide that the failure to carry out the requirements set forth in the City of Houston Equal Employment Opportunity Program shall constitute a breach of contract and may result in termination of the agreement or contract. In addition, the City may take any such additional remedy as deemed appropriate.

C. Minority and Woman Business Enterprises (MWBE)

Contactor shall comply with the City's Minority and Women Business Enterprise ("MWBE") programs as set out in Chapter 15, Article V of the City of Houston Code of Ordinances. Contractor shall make good faith efforts to award subcontracts or supply agreements in at least the value stated in this Agreement to MWBE's. Contractor acknowledges that it has reviewed the requirements for good faith efforts on file with the City's Office of Business Opportunity (OBO) and will comply with them.

D. Protests

A protest shall comply with and be resolved, according to the City of Houston Procurement Manual http://purchasing.houstontx.gov/docs/Procurement_Manual.pdf and rules adopted thereunder. Protests shall be submitted in writing and filed with both, the City Attorney and the Solicitation contact person. A pre-award protest of the RFP shall be received five (5) days prior to the solicitation due date and a post-award protest shall be filed within five (5) days after City Council approval of the contract award.

1. A protest must be filed in accordance with the timing requirements set forth herein and must include:

   a. the name, address, telephone number and email address of the protestor;
   b. the number of the solicitation;
   c. all information confirming that the protestor is an interested party;
   d. a written statement of the grounds for the protest and the law, ordinance, or policy alleged to have been violated. The statement should be accompanied by relevant supporting documentation and the relief requested.
   e. all information confirming the timeliness of the protest; and
   f. the signature of the protestor

   Protests shall be submitted to:
   Chief Procurement Officer
   City of Houston
   901 Bagby, B300
   Houston, TX 77002

2. The City recognizes three types of protests:

   a. Protests regarding solicitation (Pre-Bid Protest)
   Any protest regarding a solicitation published by the City shall be filed no later than five (5) days before the opening of bids (if a competitive bid) or due date for submittals or proposals (if an RFP/RFQ), as appropriate. Any protest filed after the due date raising issues regarding the solicitation will not be considered.

   b. Protests regarding the evaluation of bids, qualifications, or proposals (Pre-Award Protest)
   Any protest regarding the evaluation of bids, qualifications, or proposals by the City must be filed no later than ten (10) days after:
   opening of bids (if a bid); or
   due date (if RFQ/RFP); or
   notification that the interested party's bid or proposal has been rejected.
   Any protest received after the deadline will not be considered.

   c. Protests regarding award of contract (Post-Award Protest)
   Upon receipt of a timely and properly filed protest regarding the award of a contract, the City will not issue a notice to proceed or submit an order for goods until the protest has been resolved, provided such delay will not be detrimental to the interests of the City.

PART VIII – INSTRUCTIONS TO PROPOSERS

A. Pre-Proposal Conference

A Pre-Proposal Conference will be held at the date, time, and location as indicated on the first page of the RFP document. Interested Proposer(s) should plan to attend. It will be assumed that potential Proposer(s) attending this meeting have reviewed the RFP in detail, and are prepared to bring up any substantive questions not already addressed by the City.

B. Additional Information and Specification Changes

Requests for additional information and questions should be addressed to the Finance Department, Strategic Procurement Division Buyer Ketan Shah, telephone: 832.393.8714 or e-mail (preferred method to): ketan.shah@houstontx.gov no later than 5:00PM, CST September 3, 2015. The City of Houston shall provide written responses to all questions received in writing before the submittal deadline. Questions received from all Proposer(s) shall be answered and sent to all Proposer(s) who are listed as having obtained the RFP. Proposer(s) shall be notified in writing of any changes in the specifications contained in this RFP.

C. Letter(s) of Clarification

1. All Letters of Clarification and interpretations to this Solicitation shall be in writing. Any Letter of Clarification(s) or interpretation that is not in writing shall not legally bind the City of Houston. Only information supplied by the City of Houston in writing or in this RFP should be used in preparing Proposal responses.

2. The City does not assume responsibility for the receipt of any Letters of Clarification sent to Proposer(s).

D. Examination of Documents and Requirements

1. Each Proposer shall carefully examine all RFP documents and thoroughly familiarize themselves with all requirements prior to submitting a Proposal to ensure that the Proposal meets the intent of this RFP.

2. Before submitting a Proposal, each Proposer shall be responsible for making all investigations and examinations that are necessary to ascertain conditions and affecting the requirements of this RFP. Failure to make such investigations and examinations shall not relieve the Proposer from obligation to comply, in every detail, with all provisions and requirements of the RFP.

E. Exceptions to Terms and Conditions

1. All exceptions included with the Proposal shall be submitted in a clearly identified separate section of the Proposal in which the Proposer clearly cites the specific paragraphs within the RFP where the Exceptions occur. Any Exceptions not included in such a section shall be without force and effect in any resulting contract unless such Exception is specifically referenced by the Chief Procurement Officer, City Attorney, Director(s) or designee in a written statement. The Proposer's preprinted or standard terms will not be considered by the City as a part of any resulting contract.

2. All Exceptions that are contained in the Proposal may negatively affect the City's Proposal evaluation based on the evaluation criteria as stated in the RFP, or result in possible rejection of Proposal.

F. Post-Proposal Discussions with Proposer(s)

It is the City's intent to commence final negotiation with the Proposer(s) deemed most advantageous to the City. The City reserves the right to conduct post-Proposal discussions with any Proposer(s).

PART IX – REQUIRED FORMS TO BE SUBMITTED WITH PROPOSAL

A. Offer and Submittal, List of References and List of Proposed Subcontractors (Exhibit I)

B. Signed M/WBE Forms: Attachment "A" Schedule of M/WBE Participation, Attachment "B", Notice of Intent, Attachment "C", Certified M/WBE Subcontract Terms, Attachment "D" Office of Business Opportunity and Contract Compliance M/WBE Utilization Report (Exhibit II)

C. Fair Campaign Ordinance Form "A" (Exhibit III)

D. Affidavit of Ownership or Control (Exhibit IV)

E. Anti-Collusion Statement (Exhibit V)

F. Conflict of Interest Questionnaire (Exhibit VI)

PART IX – REQUIRED FORMS TO BE SUBMITTED BY AWARDED VENDOR ONLY

Required forms shall be supplied to the vendor after award.

A. Insurance Requirements and Sample Insurance Certificate (Exhibit VII)

B. Drug Compliance Agreement Attachment "A", Drug Policy Compliance Declaration Attachment "B" and Contractor's Certification of No Safety Impact Positions Attachment "C" and "D" (Exhibit VIII)

C. Hire Houston First Affidavit (Download Copy at http://www.houstontx.gov/obo/hirehoustonfirst.html and submit to Office of Business Opportunity, Houston Business Solutions Center via e-mail to houstonbsc@houstontx.gov or fax to 832-393-0650 or submit copy with proposal.

D. Requested Information Outlined in the Specification and Other Additional Relevant/Supporting Information or Alternate Proposals.

EXHIBIT I
OFFER AND SUBMITTAL, REFERENCES, PROPOSED SUBCONTRACTORS

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EXHIBIT I
OFFER AND SUBMITTAL

NOTE: PROPOSAL MUST BE SIGNED AND NOTARIZED BY AN AUTHORIZED REPRESENTATIVE(S) OF THE PROPOSER, WHICH MUST BE THE ACTUAL LEGAL ENTITY THAT WILL PERFORM THE CONTRACT IF AWARDED AND THE TOTAL FIXED PRICE CONTAINED THEREIN SHALL REMAIN FIRM FOR A PERIOD OF ONE-HUNDRED EIGHTY (180) DAYS.

"THE RESPONDENT WARRANTS THAT NO PERSON OR SELLING AGENCY HAS BEEN EMPLOYED OR RETAINED TO SOLICIT OR SECURE THIS CONTRACT UPON AN AGREEMENT OR UNDERSTANDING FOR A COMMISSION, PERCENTAGE, BROKERAGE, OR CONTINGENT FEE, EXCEPTING BONA FIDE EMPLOYEES. FOR BREACH OR VIOLATION OF THIS WARRANTY, THE CITY SHALL HAVE THE RIGHT TO ANNUL THIS AGREEMENT WITHOUT LIABILITY OR, AT ITS DISCRETION, TO DEDUCT FROM THE CONTRACT PRICES OR CONSIDERATION, OR OTHERWISE RECOVER THE FULL AMOUNT OF SUCH COMMISSION, PERCENTAGE, BROKERAGE OR CONTINGENT FEE."

Respectfully Submitted:

_____
(Print or Type Name of Contractor – Full Company Name)

City of Houston Vendor No. (If already doing business with City):
_____

Federal Identification Number:
_____

By: _____
(Signature of Authorized Officer or Agent)

Printed Name: _____

Title: _____

Date: _____

Address of Contractor: _____
Street Address or P.O. Box

_____
City – State – Zip Code

Telephone No. of Contractor: (_____) _____

Signature, Name and title of Affiant: _____

_____
(Notary Public in and for)

_____ County, Texas

My Commission Expires: _____ day of _____ 20_____

EXHIBIT I
REFERENCES
LIST OF PREVIOUS CUSTOMERS

1. Name: _____ Phone No.: _____
   Address: _____
   Contract Award Date: _____ Contract Completion Date: _____
   Contract Name/Title: _____
   Email: _____
   System Description: _____
   _____

2. Name: _____ Phone No.: _____
   Address: _____
   Contract Award Date: _____ Contract Completion Date: _____
   Contract Name/Title: _____
   Email: _____
   System Description: _____
   _____

3. Name: _____ Phone No.: _____
   Address: _____
   Contract Award Date: _____ Contract Completion Date: _____
   Contract Name/Title: _____
   Email: _____
   System Description: _____
   _____

4. Name: _____ Phone No.: _____
   Address: _____
   Contract Award Date: _____ Contract Completion Date: _____
   Contract Name/Title: _____
   Email: _____
   System Description: _____

EXHIBIT I
LIST OF SUBCONTRACTOR(S)

The following is a list of Subcontractors we propose to engage on the following items of Work. Any item of Work which does not designate a Subcontractor will be done by the firm submitting the Proposal.

SEGREGATED PART OF WORK	SUBCONTRACTOR/SUPPLIER

EXHIBIT II
ATTACHMENT "A"
SCHEDULE OF M/WBE PARTICIPATION

DATE OF REPORT: _____

BID NO.: _____

FORMAL BID TITLE: _____

NAME OF MINORITY/WOMEN SUBCONTRACTOR	OFFICE OF BUSINESS OPPORTUNITY CERTIFICATION NO.	STREET ADDRESS AND CITY, STATE, ZIP CODE	TELEPHONE NO.	SCOPE OF WORK	AGREED PRICE

TOTAL. . . . . $_____

M/WBE PARTICIPATION AMOUNT. . . . . $_____%

TOTAL BID AMOUNT. . . . . .. $_____

IF YOU HAVE USED YOUR BEST EFFORTS TO CARRY OUT THE CITY'S M/WBE POLICY BY SEEKING SUBCONTRACTS AND SUPPLY AGREEMENTS WITH MINORITY AND WOMEN BUSINESS ENTERPRISES, YET FAILED TO MEET THE STATED PERCENTAGE GOAL OF THIS BID DOCUMENT, LIST BELOW YOUR GOOD FAITH EFFORTS FOR COMPLIANCE (DEFINITION OF REQUIREMENTS CAN BE OBTAINED THROUGH THE OFFICE OF BUSINESS OPPORTUNITY AT (713) 837-9000).
THE UNDERSIGNED WILL ENTER INTO A FORMAL AGREEMENT WITH THE MINORITY AND/OR WOMEN SUBCONTRACTORS AND SUPPLIERS LISTED IN THIS SCHEDULE CONDITIONED UPON AWARD OF A CONTRACT FROM THE CITY. **NOTE:** **ALL FIRMS LISTED ABOVE MUST BE CERTIFIED (OR ELIGIBLE FOR CERTIFICATION) BY THE OFFICE OF BUSINESS OPPORTUNITY.** **THIS SCHEDULE OF M/WBE PARTICIPATION SHOULD BE RETURNED, IN DUPLICATE, WITH THE BID FORM.**

_____

BIDDER COMPANY NAME

_____

SIGNATURE OF AUTHORIZED OFFICER OR AGENT OF BIDDER

_____

NAME (TYPE OR PRINT)

_____

TITLE

EXHIBIT II
ATTACHMENT "B"
OFFICE OF BUSINESS OPPORTUNITY AND
CONTRACT COMPLIANCE M/WBE UTILIZATION REPORT

NOTICE OF INTENT

THIS AGREEMENT IS SUBJECT TO MEDIATION AND CAN BE INITIATED BY THE COMPANIES SIGNED BELOW OR THE OFFICE OF BUSINESS OPPORTUNITY.

To: City of Houston
Administering Department

Date: _____

Project Name and Number _____

Bid Amount:_____ M/W/SBE Goal: _____

_____ , agrees to enter into a contractual agreement with
Prime Contractor

_____, who will provide the following goods/services in connection
MWSBE Subcontractor

with the above-referenced contract:

_____

for an estimated amount of $_____ or _____% of the total contract value.

_____ is currently certified with the City of Houston's Office of Business
(M/W/SBE Subcontractor) Opportunity to function in the aforementioned capacity.

_____ _____ Intend to
Prime Contractor M/W/SBE Subcontractor

work on the above-named contract in accordance with the M/W/DBE Participation Section of the City of Houston Bid Provisions, contingent upon award of the contract to the aforementioned Prime Contractor.

_____	_____
Signed (Prime Contactor)	Signed (M/W/SBE Subcontractor)
_____	_____
Printed Signature	Printed Signature
_____	_____
Title Date	Title Date

EXHIBIT II
ATTACHMENT "C"
CERTIFIED M/WBE SUBCONTRACT TERMS

CITY OF HOUSTON CERTIFIED MWSBE SUBCONTRACT TERMS

Contractor shall ensure that all subcontracts with M/WSBE subcontractors and suppliers are clearly labeled **"THIS CONTRACT IS SUBJECT TO MEDIATION"** and contain the following terms:

1. _____(M/WSBE subcontractor) shall not delegate or subcontract more than 50% of the work under this subcontract to any other subcontractor or supplier without the express written consent of the City of Houston's Office of Business Opportunity Director ("the Director").

2. _____(M/WSBE subcontractor) shall permit representatives of the City of Houston, at all reasonable times, to perform 1) audits of the books and records of the subcontractor, and 2) inspections of all places where work is to be undertaken in connection with this subcontract. Subcontractor shall keep such books and records available for such purpose for at least four (4) years after the end of its performance under this subcontract. Nothing in this provision shall affect the time for bringing a cause of action or the applicable statute of limitations.

3. Within five (5) business days of execution of this subcontract, Contractor (prime contractor) and Subcontractor shall designate in writing to the Director an agent for receiving any notice required or permitted to be given pursuant to Chapter 15 of the Houston City Code of Ordinances, along with the street and mailing address and phone number of such agent.

These provisions apply to goal-oriented contracts. A goal-oriented contract means any contract for the supply of goods or non-professional services in excess of $100,000.00 for which competitive proposals are required by law; not within the scope of the MBE/WBE/SBE program of the United States Environmental Protection Agency or the United States Department of Transportation; and which the City Chief Procurement Officer has determined to have significant MWSBE subcontracting potential in fields which there are an adequate number of known MBEs , WBE's, and or SBE's (if applicable) to compete for City contracts.

The MWSBE policy of the City of Houston will be discussed during the pre-proposal conference. For information, assistance, and/or to receive a copy of the City's Affirmative Action Policy and/or Ordinance, contact the Office of Business Opportunity Division at 832.393.0600, 611 Walker Street, 7th Floor, Houston, Texas 77002.

EXHIBIT II
ATTACHMENT "D"
OFFICE OF BUSINESS OPPORTUNITY AND
CONTRACT COMPLIANCE M/WBE UTILIZATION REPORT

Report Period: _____

PROJECT NAME & NUMBER: _____ AWARD DATE:_____

PRIME CONTRACTOR: _____ CONTRACT NO.: _____

ADDRESS: _____ CONTRACT AMOUNT: _____

LIAISON/PHONE NO.: _____ M/WBE GOAL: _____

M/WBE SUB/VENDOR NAME	DATE OF OBO CERTIFICATION	DATE OF SUBCONTRACT	SUBCONTRACT AMOUNT	% OF TOTAL CONTRACT	AMOUNT PAID TO DATE	% OF CONTRACT TO DATE

Use additional pages if needed. Submit by the 15th day of the following month.
Provide support documentation on all revenues paid to end of the report period to:
M/WBE's to reflect up/down variances on Contract amount.

Office of Business Opportunity
ATTN: Carlecia Wright 713-837-9000
611 Walker, 7th Floor
Houston, Texas 77002

EXHIBIT III
FAIR CAMPAIGN ORDINANCE

The City of Houston Fair Campaign Ordinance makes it unlawful for a Contractor to offer any contribution to a candidate for City elective office (including elected officers and officers-elect). All respondents to this invitation to bid must comply with Houston Code of Ordinances Chapter 18 as amended relating to the contribution and solicitation of funds for election campaigns. Provisions of this ordinance are provided in part in the paragraphs that follow. Complete copies may be obtained from the office of the City Secretary.

Candidates for city office may neither solicit nor receive contributions except during a period commencing 270 calendar days prior to an election date for which a person is a candidate for such office and ending 90 calendar days after the election date, including run-off elections if such candidate is on the ballot.

Further, it shall be unlawful either for any person who submits a Bid or Proposal to contribute or offer any contribution to a candidate or for any candidate to solicit or accept any contribution from such person for a period commencing at the time of posting of the City Council Meeting Agenda including an item for the award of the Contract and ending upon the 30th day after the award of the Contract by City Council.

For the purposes of this Ordinance, a **Contract** is defined as each Contract having a value in excess of $30,000 that is let by the City for professional services, personal services, or other goods or services of any other nature whether the Contract is awarded on a negotiated basis, request for Proposal basis, competitive Proposal basis or formal sealed competitive Bids. The term **Contractor** includes proprietors of proprietorships, partners having an equity interest of 10% of more of partnerships, (including limited liability partnerships and companies), all officers and directors of corporations (including limited liability corporations), and all holders of 10% or more of the outstanding shares of corporations.

A STATEMENT DISCLOSING THE NAMES AND BUSINESS ADDRESSES EACH OF THOSE PERSONS WILL BE REQUIRED TO BE SUBMITTED WITH EACH BID OR PROPOSAL FOR A CITY CONTRACT. Completion of the attached form entitled **"Contractor Submission List"** will satisfy this requirement. Failure to provide this information may be just cause for rejection of your Bid or Proposal.

EXHIBIT III
FORM "A": FAIR CAMPAIGN

CITY OF HOUSTON FAIR CAMPAIGN ORDINANCE

The City of Houston Fair Campaign Ordinance makes it unlawful for a Contractor to offer any contribution to a candidate for City elective office (including elected officers-elect) during a certain period of time prior to and following the award of the Contract by the City Council. The term "Contractor" Includes proprietors of proprietorships, partners or joint venture's having an equity interest of 10 percent or more for the partnership or Joint venture, and officers, directors and holders of 10 percent or more of the outstanding shares of corporations. A statement disclosing the names and business addresses of each of those persons will be required to be submitted with each Bid or Proposal for a City Contract. See Chapter 18 of the Code of Ordinances, Houston, Texas, for further information.

This list is submitted under the Provisions of Section 18-36(b) of the Code of Ordinances, Houston, Texas, in connection with the attached Proposal, submission or bid of:

Firm or Company Name: _____

Firm or Company Address: _____

The firm/company is organized as a (Check one as applicable) and attach additional pages if needed to supply the required names and addresses:

[ ] **SOLE PROPRIETORSHIP**

Name_____ _____
Proprietor Address

[ ] **A PARTNERSHIP**

List each partner having equity interest of 10% or more of partnership (if none state "none"):

Name_____ _____
Partner Address

Name _____ _____
Partner Address

[ ] **A CORPORATION**

List all directors of the corporation (if none state "none"):

Name_____ _____
Director Address

Name_____ _____
Director Address

Name _____ _____
Director Address

List all officers of the corporation (if none state "none”):

Name_____ _____
Officer Address

Name_____ _____
Officer Address

Name_____ _____
Officer Address

List all individuals owning 10% or more of outstanding shares of stock of the corporation (if none state “none”):

Name_____ _____
Address

Name_____ _____
Address

Name_____ _____
Address

I certify that I am duly authorized to submit this list on behalf of the firm, that I am associated with the firm in the capacity noted below and that I have personal knowledge of the accuracy of the information provided herein.

_____
Preparer

_____
Printed Name

_____
Title

Note: This list constitutes a **government record** as defined by § 37.01 of the Texas Penal Code.

8/23/01

EXHIBIT IV:
CONTRACTOR OWNERSHIP DISCLOSURE ORDINANCE

City Council requires knowledge of the identities of the owners of entities seeking to Contract with the City in order to review their indebtedness to the City prior to entering Contracts. Therefore, all respondents to this Invitation to Bid must comply with Houston Code of Ordinances Chapter 15, as amended (Sections 15-122 through 15-126) relating to the disclosure of owners of entities bidding on, proposing for or receiving City contracts. Provisions of this ordinance are provided in part in the paragraphs that follow. Complete copies may be obtained from the office of the City Secretary.

Contracting entity means a sole proprietorship, corporation, non-profit corporation, partnership, joint venture, limited liability company, or other entity that seeks to enter into a contract requiring approval by the Council but excluding governmental entities.

A contracting entity must submit at the time of its Bid or Proposal, an affidavit listing the full names and the business and residence addresses of all persons owning five percent or more of a contracting entity or, where a contracting entity is a non-profit corporation, the full names and the business and residence addresses of all officers of the non-profit corporation.

Completion of the **"Affidavit of Ownership or Control,"** included herein, and submitted with the Official Bid or Proposal Form will satisfy this requirement. Failure to provide this information may be just cause for rejection of your Bid or Proposal.

EXHIBIT IV:
AFFIDAVIT OF OWNERSHIP OR CONTROL

ORIG. DEPT.:_____ **FILE/I.D. NO.:**_____

INSTRUCTION: ENTITIES USING AN ASSUMED NAME SHOULD DISCLOSE SUCH FACT TO AVOID REJECTION OF THE AFFIDAVIT. THE FOLLOWING FORMAT IS RECOMMENDED: CORPORATE/LEGAL NAME DBA ASSUMED NAME.

STATE OF _____ **§**
§ **AFFIDAVIT OF OWNERSHIP OR CONTROL**
COUNTY OF _____ **§**

BEFORE ME, the undersigned authority, on this day personally appeared _____ [***FULL NAME***] (hereafter "Affiant"), _____ [***STATE TITLE/CAPACITY WITH CONTRACTING ENTITY***] of _____ [***CONTRACTING ENTITY'S CORPORATE/LEGAL NAME***] ("Contracting Entity"), who being by me duly sworn on oath stated as follows:

1. Affiant is authorized to give this affidavit and has personal knowledge of the facts and matters herein stated.

2. Contracting Entity seeks to do business with the City in connection with _____ [***DESCRIBE PROJECT OR MATTER***] which is expected to be in an amount that exceeds $50,000.

3. The following information is submitted in connection with the proposal, submission or bid of Contracting Entity in connection with the above described project or matter.

4. Contracting Entity is organized as a business entity as noted below (check box as applicable).

FOR PROFIT ENTITY:

[ ] SOLE PROPRIETORSHIP
[ ] CORPORATION
[ ] PARTNERSHIP
[ ] LIMITED PARTNERSHIP
[ ] JOINT VENTURE
[ ] LIMITED LIABILITY COMPANY
[ ] OTHER (Specify type in space below)

NON-PROFIT ENTITY:

[ ] NON-PROFIT CORPORATION
[ ] UNINCORPORATED ASSOCIATION

_____

_____

5. The information shown below is true and correct for the Contracting Entity and all owners of 5% or more of the Contracting Entity and, where the Contracting Entity is a non-profit entity, the required information has been shown for each officer, *i.e.*, president, vice-president, secretary, treasurer, etc. **[NOTE**: IN ALL CASES, USE FULL NAMES, LOCAL BUSINESS AND RESIDENCE ADDRESSES AND TELEPHONE NUMBERS. DO NOT USE POST OFFICE BOXES FOR ANY ADDRESS. INCLUSION OF E-MAIL ADDRESSES IS OPTIONAL, BUT RECOMMENDED. ATTACH ADDITIONAL SHEETS AS NEEDED.]

Contracting Entity

Name: _____

Business Address *[NO./STREET]* _____

[CITY/STATE/ZIP CODE] _____

Telephone Number (_____)_____

Email Address ***[OPTIONAL]***_____

Residence Address *[NO./STREET]* _____

*[CITY/STATE/ZIP CODE]*_____

Telephone Number (_____)_____

Email Address ***[OPTIONAL]***_____

5% Owner(s) or More (IF NONE, STATE "NONE.")

Name: _____

Business Address *[NO./STREET]* _____

*[CITY/STATE/ZIP CODE]*_____

Telephone Number (_____)_____

Email Address ***[OPTIONAL]***_____

Residence Address *[NO./STREET]* _____

*[CITY/STATE/ZIP CODE]*_____

Telephone Number (_____)_____

Email Address ***[OPTIONAL]***_____

6. ***Optional Information***

Contracting Entity and/or _____ [***NAME OF OWNER OR NON-PROFIT OFFICER***] is actively protesting, challenging or appealing the accuracy and/or amount of taxes levied against _____ [***CONTRACTING ENTITY, OWNER OR NON-PROFIT OFFICER***] as follows:

Name of Debtor: _____

Tax Account Nos. _____

Case or File Nos. _____

Attorney/Agent Name _____

Attorney/Agent Phone No. (_____)_____

Tax Years _____

Status of Appeal ***[DESCRIBE]*** _____

_____

_____

_____

Affiant certifies that he or she is duly authorized to submit the above information on behalf of the Contracting Entity, that Affiant is associated with the Contracting Entity in the capacity noted above and has personal knowledge of the accuracy of the information provided herein, and that the information provided herein is true and correct to the best of Affiant's knowledge and belief.

_____

Affiant

SWORN TO AND SUBSCRIBED before me this _____ day of _____, 20_____.

(Seal)

_____

Notary Public

NOTE:

This affidavit constitutes a **government record** as defined by Section 37.01 of the Texas Penal Code. Submission of a false government record is punishable as provided in Section 37.10 of the Texas Penal Code. Attach additional pages if needed to supply the required names and addresses.

EXHIBIT V
ANTI-COLLUSION STATEMENT

Anti-Collusion Statement

The undersigned, as Proposer, certifies that the only person or parties interested in this Proposal as principals are those named herein; that the Proposer has not, either directly or indirectly entered into any Agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the award of this Contract.

_____ _____

Date Proposer Signature

EXHIBIT VI
CONFLICT OF INTEREST QUESTIONNAIRE

CONFLICT OF INTEREST QUESTIONNAIRE:
Chapter 176.006 of the Local Government Code ("the code") requires a Vendor/Contractor to file a Conflict of Interest Questionnaire (CIQ) with the City.

NOTE: Vendors/Contractors or Agents should **not** complete the CIQ if a conflict, as described below, **does not exist. Only Vendors/Contractors or Agents that actually have a conflict, as described below, must file a CIQ.**

Who must file a CIQ?
A Vendor/Contractor or Agent of a Vendor/Contractor does not have to file a CIQ unless they intend to enter or is considering entering into a contract with the City or:

1. has an employment or other business relationship with the Local Government Officer/Family Member; or
2. has given the Local Government Officer/Family Member one or more gifts with the aggregate value exceeding $250.00.

When must the Vendor/Contractor or Agent file a CIQ?
The completed CIQ must be filed with the City Chief Procurement Officer not later than the 7th business day after the date the Vendor/Contractor or Agent:

1. begins discussions or negotiations to enter into a contract with the City;
2. submits an application to the City in response to a request for proposals or bids, correspondence, or any other writing related to a potential contract with the City;
3. becomes aware of an employment or other business relations with the Local Government Officer/Family Member;
4. becomes aware that he/she has given one or more gifts to the Local Government Officer/Family Member that exceeds $250.00; or
5. an event that would make the CIQ incomplete or inaccurate.

What is a business relationship?
Under Chapter 176, business relationship means a connection between two or more parties based on the commercial activity of one of the parties. The term does not include:

1. a transaction that is subject to a rate or fee regulation by a governmental entity;
2. a transaction conducted at a price and subject to terms available to the public; or
3. a purchase or lease of goods or services from a person who is chartered by a state or federal agency and is subject to regular examination and reporting to that agency.

The Conflict of Interest Questionnaire is available for downloading from the Texas Ethics Commission's website at http://www.ethics.state.tx.us/forms/CIQ.pdf .

The Original Conflict of Interest Questionnaire shall be filed with the Administration and Regulatory Affairs Department's Record Administration (Lourdes Coss, City Chief Procurement Officer, 901 Bagby, Concourse Level, Houston, Texas 77002). Vendors and Contractors required to file shall include a copy of the form as part of the BID/Proposal package**. Any questions about filling out this form should be directed to your attorney.**

EXHIBIT VI
CONFLICT OF INTEREST QUESTIONNAIRE

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____
Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

_____ _____
Signature of person doing business with the governmental entity Date

Adopted 06/29/2007

EXHIBIT VII
Insurance Requirement and Sample Insurance Certificate

Form Number: HOU2
Edition Date: 05/01/2014

CERTIFICATE OF INSURANCE FOR SERVICES

This certificate of insurance is provided for informational purposes only. This certificate does not confer any rights or obligations other than the rights and obligations conveyed by the policies referenced on this certificate. The terms of the referenced policies control over the terms of this certificate.

Prior to the beginning of work, the vendor shall obtain the minimum insurance and endorsements specified. Agents must complete the form providing all requested information and submit by fax, U.S. mail, or e-mail as requested by The City of Houston. The endorsements listed below are required as attachments to this certificate; copies of the endorsements are also acceptable. PLEASE ATTACH ALL ENDORSEMENTS TO THIS FORM, AND INCLUDE THE MATCHING POLICY NUMBER ON THE ENDORSEMENT. **Only City of Houston certificates of insurance are acceptable; commercial carriers' certificates are not.**

Producer: [Insert name of Insurance Company] A

Street/Mailing Address: [Insert address of insurance company]

City: [Insert city] State: [Insert State] Zip Code: [Zip Code] Phone#: [Office Phone Number]

Insured: [Insert name of the Contractor] B

Street/Mailing Address: [Insert mailing address of Contractor]

City: [Insert city] State: [Insert State] Zip Code: [Zip Code] Phone#: [Office Phone Number]

WORKERS COMPENSATION INSURANCE COVERAGE: C
Endorsed with a Waiver of Subrogation in favor of *The City of Houston*
Waiver of Subrogation Endorsement Number: [Enter [illegible] Subr[illegible]dorsement Number]

Carrier Name: [Insert insurance company name] NAIC#: [Insert NAICS code] D		E	Carrier Phone Number: [Office Phone Number]	
Address: [Insert address of insurance company]		City: [Insert city]	State: [Insert State]	Zip: [Zip Code]
Type of Insurance	Policy Number	Effective Date	Expiration Date	Limits of Liability
Workers Compensation Insurance _____	[Enter Policy Number] F	[Enter Effective Date] G	[Enter Expiration Date] G	☐ W.C. Statutory Limits E.L. Each Accident $[Enter policy amount] E.L. Disease – Each Employee $[Enter policy amount] H
Employers' Liability	[Enter Policy Number]	[Enter Effective Date]	[Enter Expiration Date]	E.L. Disease – Policy Limit $[Enter policy amount]

COMMERCIAL GENERAL LIABILITY INSURANCE: C
Endorsed with *The City of Houston as Additional I[illegible]* I *[illegible] with a Waiver of Subrogation in favor of The City of Hou[illegible]*
Additional Insured Endorsement #: [illegible] **Subrogation Endorsement #:** [Enter Endorsem[illegible]

Carrier Name: [Insert insurance c[illegible]name] NAIC#: [Insert NAICS code] D		E	Carrier Phone Number: [Office Phone Number]	
Address: [Insert address of insurance company]		City: [Insert city]	State: [Insert State]	Zip: [Zip Code]
Type of Insurance	Policy Number	Effective Date	Expiration Date	Limits of Liability
Commercial General Liability Insurance *(choose one)* ___Claims Made J ___Occurrence	[Enter Policy Number] F	[Enter Effective Date] G	[Enter Expiration Date] G	Each Occurrence: $[Enter policy amount] Products/Completed Operations Aggregate $[Enter policy amount] H General Aggregate $[Enter policy amount]

Page 1 of 5 July, 2014

AUTOMOBILE LIABILITY INSURANCE:

Endorsed with The City of Houston as Additional Insure [illegible] with a Waiver of Subrogation in favor of The City of Houston

Additional Insured Endorsement Number: [Enter Endors [illegible] umber] **Waiver of Subrogation Endorsement Number:** Waiver of Subrogation Endorsement Nu[illegible]

Carrier Name: [Insert insurance company [illegible] NAIC#: [Insert NAICS code]			Carrier Phone Number: [Office Phone Number]	
Address: [Insert address of insurance company]		City: [Insert city]	State: [Insert State]	Zip: [Zip Code]
Type of Insurance	Policy Number	Effective Date	Expiration Date	Limits of Liability
☐ Any auto ☐ All Owned autos ☐ Hired Autos ☐ Scheduled Autos ☐ Non-owned Autos	[Enter Policy Number]	[Enter Effective Date]	[Enter Expiration Date]	Combined Single Limit $[Enter policy amount] Bodily Injury (per perso $[Enter policy amount] Bodily Injury (per accident) $[Enter policy amount] Property Damage (per accident) $[Enter policy amount]

OTHER INSURANCE COVERAGE: (i.e. Excess [illegible] MCS [illegible] other needed insurance; use 3d page for needed information)

Carrier Name: [Insert insurance company [illegible] NAIC#: [Insert NAICS code]			Carrier Phone Number: [Office Phone Number]	
Address: [Insert address of insurance company]		City: [Insert city]	State: [Insert State]	Zip: [Zip Code]
Type of Insurance	Policy Number	Effective Date	Expiration Date	Limits of Liability
Excess Liability	[Enter Policy Number]	[Enter Effective Date]	[Enter Expiration Date]	$[Enter policy amount]
Pollution	[Enter P[illegible]ber]	[Enter E[illegible]ate]	[Ente[illegible]n Date]	$[Enter policy amoun[illegible]
Builder's Risk	[Enter P[illegible]ber]	[Enter E[illegible]ate]	[Ente[illegible]n Date]	$[Enter policy amoun[illegible]
Other [EnterOther Insurance]	[Enter Policy Number]	[Enter Effective Date]	[Enter Expiration Date]	$[Enter policy amount]
Other [EnterOther Insurance]	[Enter Policy Number]	[Enter Effective Date]	[Enter Expiration Date]	$[Enter policy amount]

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE CONTRACT PROVISIONS.

PROJECT DESCRIPTION (Insert Project Manager Name, City Department and Mailing Address, and WBS Number)

[Insert Project Manager Name, City Department and Mailing Address, WBS Number, and Project Description]

AGENT CERTIFICATION

THIS IS TO CERTIFY TO THE CITY OF HOUSTON that the insurance policies above are in full force and effect.

Name of Insurance Company: [Insert [illegible] Company]	Name of Authorized Agent: [Insert name of Insurance Agent]
Company Address: [Insert address of in[illegible]pany]	Agent's Address: [Insert ad[illegible]urance agent]
City: [Insert city] State: [Insert State] Zip: [Zip Code]	City: [Insert city] State: [Insert State] Zip: [Zip Code]
Authorized Agent's Phone Number (including Area Code) [Office Phone Number]	Original Signature of Authorized Agent X
	Date [Date of Signature]

Additional Notes:

WORKERS COMPENSATION INSURANCE COVERAGE

Q

COMMERCIAL GENERAL LIABILITY INSURANCE

Q

AUTOMOBILE LIABILITY INSURANCE

Q

OTHER INSURANCE COVERAGE

Q

Additional Carrier Information (if multiple carriers providing insurance)

Carrier Name: [Insert insurance company name]
NAIC#: [Insert NAICS code]
Carrier Phone Number: [Insert Office Phone Number]
Type of Insurance: [Insert specific type of insurance]

D E

Carrier Name: [Insert insurance company name]
NAIC#: [Insert NAICS code]
Carrier Phone Number: [Insert Office Phone Number]
Type of Insurance: [Insert specific type of insurance]

D E

Carrier Name: [Insert insurance company name]
NAIC#: [Insert NAICS code]
Carrier Phone Number: [Insert Office Phone Number]
Type of Insurance: [Insert specific type of insurance]

D E

SAMPLE

Complete the certificate of insurance with the information listed below:
(Instructions for completing and submitting a certificate to the City of Houston)

A) The Producer is the Insurance Agency. Fill in the complete name, address, and telephone number for the insurance agency.
   1) The City requires all insurance companies to be authorized to do business in the State of Texas and be rated by A.M. Best with a rating of B+ (or better) Class VI (or higher) or otherwise be acceptable to the City if not rated by A. M. Best.

B) The Insured is the entity vendor entering into a contract with the City of Houston. Fill in the complete name, address, and telephone number.

C) Please provide the form number for the Waiver of Subrogation Endorsement. The City of Houston's preferred endorsement form is Waiver of Transfer of Rights of Recovery against Others – CG2404. Use of the preferred endorsement will expedite execution of the agreement.

D) The Carrier is the insurance company providing the specific coverage. Fill in the complete name and address for the insurance company providing coverage.

E) NAIC # means a number assigned by the National Association of Insurance Commissioners to all insurance companies.

F) Fill in the Insurance Policy number.

G) Insurance policies must be in effect at the time of contract. If any policy has expired, a new Certificate of Insurance must be submitted with the new policy information.

H) Fill in the limit for the Insurance Policy.

I) Additional Insured Endorsement Number. The City of Houston's preferred endorsement form is Additional Insured Endorsement – CA0403. Use of the preferred endorsement will expedite execution of the agreement.

J) General Liability Insurance Policy. The specific coverage must be specified: Claims Made or Occurrence. Occurrence coverage is preferred, but Claims Made coverage may be accepted subject to approval by the City of Houston.

K) Automobile Liability Insurance. Any Auto **OR** All Owned Autos, Hired Autos and Non-Owned Autos must be checked. The City of Houston's preferred endorsement form is Business Auto Extension Endorsement – CAT353. Use of the preferred endorsement will expedite execution of the agreement.

L) Choose the necessary insurance by **underlining** it. Builder's Risk Policy is for construction projects, as designated by the City. Professional Liability Coverage is for professional services, if required by the City. Umbrella Coverage must be checked in this section and by occurrence when it is required by contract and in accordance with the contract value.

M) The name and contact information of the Producer providing the insurance.

N) The name and contact information for the Authorized Agent of the Producer, including the area code and phone number.

O) The **original** signature of the Authorized Agent.

P) The vendor should place the required Project Description information (Project Manager Name, City Department and Mailing Address, and WBS Number) here. This information was previously placed in the

[END OF DOCUMENT]

PART X – SAMPLE CITY OF HOUSTON AGREEMENT (SUBJECT TO CHANGE)

AGREEMENT FOR _____

THE STATE OF TEXAS '
'
COUNTY OF HARRIS '

THIS AGREEMENT FOR _____ ("Agreement") is made on the date countersigned by the City Controller ("Effective Date"), by and between the **CITY OF HOUSTON, TEXAS** (the "City"), a Texas Home Rule City of the State of Texas principally situated in Harris County, and **_____** (the "Contractor"), a **_____** doing business in Texas.

The Parties agree as follows:

ARTICLE 1. PARTIES

1.1. ADDRESS

1.1.1. The initial addresses of the Parties, which one Party may change by giving written notice of its changed address to the other Party, are as follows:

City	**Contractor**
City of Houston	_____
Director of _____	_____
PO Box _____	_____
Houston, TX _____	_____

With Copy To	**With Copy To**
City Attorney	_____
City of Houston	_____
PO Box 368	_____
Houston, TX 77001	_____

1.2. TABLE OF CONTENTS

1.2.1. This Agreement consists of the following articles and exhibits:

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1.3. PARTS INCORPORATED

1.3.1. The above described articles and exhibits are incorporated into this Agreement.

1.4. CONTROLLING PARTS

1.4.1. If a conflict among the articles and exhibits arises, the articles control over the exhibits.

[SIGNATURE PAGE FOLLOWS]

1.5. SIGNATURES

1.5.1. The Parties have executed this Agreement in multiple copies, each of which is an original.

CONTRACTOR:

_____

By: _____
NAME:
POSITION:

ATTEST/SEAL (if a corporation):
WITNESS (if not a corporation):

_____
NAME:

Tax Identification No.: _____

CITY:

CITY OF HOUSTON, TEXAS

By:_____
Mayor

ATTEST/SEAL:

_____
City Secretary

APPROVED:

_____
Director, _____

APPROVED AS TO FORM:

_____
Assistant City Attorney
L.D. File No. _____

COUNTERSIGNED BY:

_____
City Controller

DATE COUNTERSIGNED:

_____
("Effective Date")

ARTICLE 2. DEFINITIONS

2.1. In addition to the words and terms defined elsewhere in this Agreement, the following terms have the meanings set out below:

2.1.1. "*Accept*" or "*Acceptance*" means the act of the Director by which the City assumes for itself, approval of specific services, as partial or complete performance of the Agreement.

2.1.2. "*Agreement*" means this contract between the Parties, including all exhibits and any written amendments authorized by City Council and Contractor.

2.1.3. "*Business Day(s)*" mean(s) any day that is not a Saturday, Sunday, or City Holiday. In the event that any deadline set forth in this Agreement falls on a Saturday, Sunday, or City Holiday, the deadline shall automatically be extended to the next day that is not a Saturday, Sunday, or City Holiday.

2.1.4. "*City*" is defined in the preamble of this Agreement and includes its successors and assigns.

2.1.5. "*City Attorney*" means the City Attorney of the City or any person designated by the City Attorney to perform one or more of the duties of the City Attorney under this Agreement.

2.1.6. "*City Data*" means all Documents and/or Information: (i) that the City discloses, supplies, or provides to Contractor under, pursuant to, or in connection with this Agreement, (ii) that Contractor obtains, receives, or collects under, pursuant to, or in connection with this Agreement, and/or (iii) collected, received, entered, stored, archived, retained, maintained, processed, or transmitted in, into, or by the Software.

2.1.7. "*City Holiday*" means any official City of Houston holiday as determined each year by the City Council.

2.1.8. "*City Personnel*" means all City employees, but not elected officials.

2.1.9. "*Confidential Information*" means all non-public Documents or Information of a Party to this Agreement, including without limitation any such Documents or Information that is identified as or would be reasonably understood to be confidential, proprietary, and/or sensitive.

2.1.10. "*Contractor*" is defined in the preamble of this Agreement and includes its successors and assigns.

2.1.11. "*Contractor Data*" means all Documents and/or Information that Contractor discloses, supplies, or provides to the City under, pursuant to, or in connection

with this Agreement.

2.1.12. "*Day(s)*" means calendar day, including weekends and legal holidays, whether capitalized or not, unless otherwise specifically provided. In the case of plural "days", those days will be consecutive.

2.1.13. "*Deliverable(s)*" mean(s) any services, products, goods, Equipment, Documents, or other tangible item provided by Contractor to the City in connection with this Agreement.

2.1.14. "*Director*" means the _____, or any person designated by the Director to perform one or more of the Director's duties under this Agreement.

2.1.15. "*Disclosing Party*" means a Party who discloses, supplies, or provides Confidential Information to another Party or whose Confidential Information is otherwise in the possession, custody, or control of another Party.

2.1.16. "*Documents*" means all original and non-identical copy of any written, typed, or printed matter, or electronically stored information, of any kind or description.

2.1.16.1. The word "documents" includes, but is not limited to, the following: warranties,agendas, analyses, audio or video recordings, bulletins, charts, circulars, communications (including any interoffice, social media, and other communications), computations, computer programs, copies, correspondence, data, databases, data compilations, data prototypes, designs, diagrams, diskettes, documents, drafts, drawings, electronic mail (email), electronically stored information, exhibits, facsimiles, forms, graphs, guides, images, information, inventions, items, letters, logs, manuals, maps, materials, memoranda, metadata, microfilm, minutes or meeting minutes, models, notes, notations, notebooks, operating manuals, original tracings of all drawings and plans, other graphic matter (however produced or reproduced), pamphlets, photographs (including any digital or film photographs), plans, printouts, policies, procedures, records, recordings (including any audio, video, digital, film, tape, and other recordings), reports, social media communications, software, specifications, tabulations, telegrams, underlying data, works, worksheets, work products, writings, and any other writings or recordings of any type or nature (and any revisions, modifications, or improvements to them).

2.1.17. Intentionally deleted.

2.1.18. "*Effective Date*" means the date the City Controller countersigns the signature page of this Agreement and the Agreement becomes effective and binding.

2.1.19. "*Equipment*" means any and all hardware, equipment, material, goods, products,

or other tangible items that Contractor provides or furnishes to City under, pursuant to, or in connection with this Agreement.

2.1.20. "*Information*" means all information, data, facts, or knowledge of any kind or description whether in tangible or intangible form.

2.1.21. "*Include*" and "*including*", and words of similar import, shall be deemed to be followed by the words "without limitation".

2.1.22. Intentionally deleted.

2.1.23. "*Notice to Proceed*" means a written communication from the Director to Contractor instructing Contractor to begin performance under this Agreement.

2.1.24. Intentionally deleted.

2.1.25. "*Party*" or "*Parties*" means City and Contractor who are bound by this Agreement, individually or collectively as indicated in the context by which it appears.

2.1.26. "*Proprietary Rights*" mean any copyrights, trademarks, trade secrets, patents, or any other intellectual or proprietary rights.

2.1.27. "*Receiving Party*" means a Party who obtains, receives, or collects Confidential Information of another Party or who otherwise has possession, custody, or control of Confidential Information of another Party.

2.1.28. "*Services*" means all services required by or reasonably inferable from the Agreement and **Exhibit A** including all labor, materials, tools, supplies, Equipment, transportation, mobilization, insurance, subcontracts, supervision, management, reports, incidentals, quality control, and other items necessary or incidental by Contractor to fulfilling Contractor's obligations.

2.1.29. Intentionally deleted.

2.1.30. Intentionally deleted.

2.1.31. "*Term*" means the entire period during which this Agreement is in effect, starting on the Effective Date and continuing through the final date of termination or expiration of this Agreement, including any renewals or extensions.

2.1.32. Intentionally deleted.

2.1.33. "*Writing*" or "*written*" shall mean a written communication from one Party to the other, including an electronic communication or e-mail.

2.2. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words in the singular include the plural.

2.3. The word "*shall*" is always mandatory and not merely permissive.

ARTICLE 3. DUTIES OF CONTRACTOR

3.1. SCOPE OF SERVICES

3.1.1. In consideration of the payments specified in this Agreement, Contractor shall provide all labor, material, and supervision necessary to perform the Services and furnish the Deliverables described in **Exhibit A**.

3.2. COORDINATE PERFORMANCE

3.2.1. Contractor shall coordinate its performance with the Director. Contractor shall promptly inform the Director and other person(s) of all significant events relating to the performance of this Agreement.

3.3. REPORTS

3.3.1. Contractor shall submit all reports and progress updates required by the Director and as may be required in **Exhibit A**.

3.4. SCHEDULE OF PERFORMANCE

3.4.1. Time of Performance

3.4.1.1. The Director shall provide Contractor a written Notice to Proceed specifying a date to begin performance.

3.4.2. Time Extensions

3.4.2.1. If Contractor requests an extension of time to complete its performance, then the Director may, in his discretion, extend the time so long as the extension does not exceed _____. The extension must be in writing, but does not require amendment of this Agreement. Contractor is not entitled to damages for delay(s) regardless of the cause of the delay(s).

3.5. PROMPT PAYMENT OF SUBCONTRACTORS

3.5.1. In accordance with the Texas Prompt Payment Act, Contractor shall make timely payments to all persons and entities supplying labor, materials, or equipment for the performance of this Agreement. **CONTRACTOR SHALL DEFEND AND**

INDEMNIFY THE CITY FROM ANY CLAIMS OR LIABILITY ARISING OUT OF CONTRACTOR'S FAILURE TO MAKE THESE PAYMENTS.

3.6. CONTRACTOR'S PERSONNEL

3.6.1. In selecting Contractor for this Agreement, the City relied on the qualifications and experience of those persons identified by Contractor by name as performing the Services ("Key Personnel") as listed in **Exhibit C**. Contractor must not reassign or replace Key Personnel without the Director's prior written approval. Upon the Director's approval, the Director shall update **Exhibit C**, which does not require amendment to this Agreement, to reflect the new Key Personnel.

3.6.2. Contractor shall replace any of its personnel, including Key Personnel, or subcontractors whose performance, work, or work product is deemed unsatisfactory at the Director's discretion.

3.7. RELEASE

3.7.1. **CONTRACTOR AGREES TO AND SHALL RELEASE THE CITY, ITS AGENTS, EMPLOYEES, OFFICERS, AND LEGAL REPRESENTATIVES (COLLECTIVELY THE "CITY") FROM ALL LIABILITY FOR INJURY, DEATH, DAMAGE, OR LOSS TO PERSONS OR PROPERTY SUSTAINED IN CONNECTION WITH OR INCIDENTAL TO PERFORMANCE UNDER THIS AGREEMENT, EVEN IF THE INJURY, DEATH, DAMAGE, OR LOSS IS CAUSED BY THE CITY'S SOLE OR CONCURRENT NEGLIGENCE AND/OR THE CITY'S STRICT PRODUCTS LIABILITY OR STRICT STATUTORY LIABILITY.**

3.8. INDEMNIFICATION

3.8.1. **CONTRACTOR AGREES TO AND SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY, ITS AGENTS, EMPLOYEES, OFFICERS, AND LEGAL REPRESENTATIVES (COLLECTIVELY THE "CITY") HARMLESS FOR ALL CLAIMS, CAUSES OF ACTION, LIABILITIES, FINES, AND EXPENSES (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES, COURT COSTS, AND ALL OTHER DEFENSE COSTS AND INTEREST) FOR INJURY, DEATH, DAMAGE, OR LOSS TO PERSONS OR PROPERTY SUSTAINED IN CONNECTION WITH OR INCIDENTAL TO PERFORMANCE UNDER THIS AGREEMENT INCLUDING, WITHOUT LIMITATION, THOSE CAUSED BY:**

3.8.1.1. **CONTRACTOR'S AND/OR ITS AGENTS', EMPLOYEES', OFFICERS', DIRECTORS', CONTRACTORS', OR SUBCONTRACTORS' (COLLECTIVELY IN NUMBERED PARAGRAPHS 3.8.1.1.-3.8.1.3., "CONTRACTOR") ACTUAL OR**

ALLEGED NEGLIGENCE OR INTENTIONAL ACTS OR OMISSIONS;

3.8.1.2. **THE CITY'S AND CONTRACTOR'S ACTUAL OR ALLEGED CONCURRENT NEGLIGENCE, WHETHER CONTRACTOR IS IMMUNE FROM LIABILITY OR NOT; AND**

3.8.1.3. **THE CITY'S AND CONTRACTOR'S ACTUAL OR ALLEGED STRICT PRODUCTS LIABILITY OR STRICT STATUTORY LIABILITY, WHETHER CONTRACTOR IS IMMUNE FROM LIABILITY OR NOT.**

3.8.2. **CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY HARMLESS DURING THE TERM OF THIS AGREEMENT AND FOR FOUR YEARS AFTER THE AGREEMENT TERMINATES. CONTRACTOR'S INDEMNIFICATION IS LIMITED TO $1,000,000 PER OCCURRENCE OR THE STATUTORY MAXIMUM, WHICHEVER IS GREATER. CONTRACTOR SHALL NOT INDEMNIFY THE CITY FOR THE CITY'S SOLE NEGLIGENCE.**

3.9. INTELLECTUAL PROPERTY RELEASE AND INDEMNIFICATION

3.9.1. **CONTRACTOR AGREES TO AND SHALL RELEASE AND DEFEND, INDEMNIFY, AND HOLD THE CITY, ITS AGENTS, EMPLOYEES, OFFICERS, AND LEGAL REPRESENTATIVES (COLLECTIVELY THE "CITY") HARMLESS FROM ALL CLAIMS OR CAUSES OF ACTION BROUGHT AGAINST THE CITY BY ANY PARTY, INCLUDING CONTRACTOR, ALLEGING THAT THE CITY'S USE OF ANY EQUIPMENT, SOFTWARE, PROCESS, OR DOCUMENTS CONTRACTOR FURNISHES DURING THE TERM OF THIS AGREEMENT INFRINGES ON A PATENT, COPYRIGHT, SERVICE MARK, OR TRADEMARK, OR MISAPPROPRIATES A TRADE SECRET. CONTRACTOR SHALL PAY ALL COSTS (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES, COURT COSTS, AND ALL OTHER DEFENSE COSTS, AND INTEREST) AND DAMAGES AWARDED.**

3.9.2. **CONTRACTOR SHALL NOT SETTLE ANY CLAIM ON TERMS WHICH PREVENT THE CITY FROM USING THE EQUIPMENT, SOFTWARE, PROCESS, AND DOCUMENTS WITHOUT THE CITY'S PRIOR WRITTEN CONSENT.**

3.9.3. **WITHIN 60 DAYS AFTER BEING NOTIFIED OF THE CLAIM, CONTRACTOR SHALL, AT ITS OWN EXPENSE, EITHER (1) OBTAIN FOR THE CITY THE RIGHT TO CONTINUE USING THE EQUIPMENT, SOFTWARE, PROCESS, AND DOCUMENTS OR, (2) IF BOTH PARTIES AGREE, REPLACE OR MODIFY THEM WITH**

COMPATIBLE AND FUNCTIONALLY EQUIVALENT PRODUCTS. IF NONE OF THESE ALTERNATIVES IS REASONABLY AVAILABLE, THE CITY MAY RETURN THE EQUIPMENT, SOFTWARE, OR DOCUMENTS, OR DISCONTINUE THE PROCESS, AND CONTRACTOR SHALL REFUND THE PURCHASE PRICE.

3.10. SUBCONTRACTOR'S INDEMNITY

3.10.1. **CONTRACTOR SHALL REQUIRE ALL OF ITS SUBCONTRACTORS (AND THEIR SUBCONTRACTORS) TO RELEASE AND INDEMNIFY THE CITY TO THE SAME EXTENT AND IN SUBSTANTIALLY THE SAME FORM AS ITS RELEASE AND INDEMNITY TO THE CITY.**

3.11. INDEMNIFICATION PROCEDURES

3.11.1. *Notice of Claims.*

3.11.1.1. If the City or Contractor receives notice of any claim or circumstances, which could give rise to an indemnified loss, the receiving Party shall give written notice to the other Party within 10 days. The notice must include the following:

3.11.1.1.1. a description of the indemnification event in reasonable detail, and

3.11.1.1.2. the basis on which indemnification may be due, and

3.11.1.1.3. the anticipated amount of the indemnified loss.

3.11.1.2. This notice does not stop or prevent the City from later asserting a different basis for indemnification or a different amount of indemnified loss than that indicated in the initial notice. If the City does not provide this notice within the 10 day period, it does not waive any right to indemnification except to the extent that Contractor is prejudiced, suffers loss, or incurs expense because of the delay. If Contractor does not provide this notice within the 10-day period, it does not waive any right to indemnification except to the extent that City is prejudiced, suffers loss or incurs expenses because of the delay.

3.11.2. *Defense of Claims.*

3.11.2.1. *Assumption of Defense.* Contractor may assume the defense of the claim at its own expense. If Contractor assumes the defense of the claim, Contractor shall then control the defense and any negotiations to settle the claim. Contractor shall notify the City of any and all offers to settle the claim.

3.11.2.2. *Continued Participation.* If Contractor elects to defend the claim, the

City may retain separate counsel to participate in (but not control) the defense and to participate in (but not control) any settlement negotiations. Contractor may settle the claim without the consent or agreement of the City, unless it (i) would result in injunctive relief or other equitable remedies or otherwise require the City to comply with restrictions or limitations that adversely affect the City, (ii) would require the City to pay amounts that Contractor does not fund in full, or (iii) would not result in the City's full and complete release from all liability to the plaintiffs or claimants who are parties to or otherwise bound by the settlement.

3.12. INSURANCE

3.12.1. *Risks and Limits of Liability.* Contractor shall maintain the following insurance coverages in the following amounts:

Coverage	**Limit of Liability**
Workers' Compensation	Statutory for Workers' Compensation
Employer's Liability	• Bodily Injury by Accident $100,000 (each accident) • Bodily Injury by Disease $100,000 (policy limit) • Bodily Injury by Disease $100,000 (each employee)
Commercial General Liability: Bodily and Personal Injury; Products and Completed Operations Coverage	Bodily Injury and Property Damage, Combined Limits of $1,000,000 each Occurrence, and $1,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit for (1) Any Auto or (2) All Owned, Hired, and Non-Owned Autos
Professional Liability	$1,000,000 per occurrence; $1,000,000 aggregate
Excess Liability applicable to CGL, and Auto	$1,000,000
Aggregate Limits are per 12-month policy period unless otherwise indicated.	

3.12.2. *Insurance Coverage.* At all times during the term of this Contract and any extensions or renewals, Contractor shall provide and maintain insurance coverage that meets the Contract requirements. Prior to beginning performance under the Contract, at any time upon the Director's request, or each time coverage is renewed or updated, Contractor shall furnish to the Director current certificates of insurance, endorsements, all policies, or other policy documents evidencing adequate coverage, as necessary. Contractor shall be responsible for and pay (a) all premiums and (b) any claims or losses to the extent of any deductible amounts. Contractor waives any claim it may have for premiums or deductibles against the City, its officers, agents, or employees. Contractor shall also require all subcontractors or consultants whose subcontracts exceed $100,000 to provide proof of insurance coverage meeting all requirements stated above except amount. The amount must be commensurate with the amount of the subcontract, but no less than $500,000 per claim.

3.12.3. *Form of Insurance.* The form of the insurance shall be approved by the Director and the City Attorney; such approval (or lack thereof) shall never (a) excuse non-compliance with the terms of this Section, or (b) waive or estop the City from asserting its rights to terminate this Contract. The policy issuer shall (1) have a Certificate of Authority to transact insurance business in Texas, or (2) be an eligible non-admitted insurer in the State of Texas and have a Best's rating of at least B+, and a Best's Financial Size Category of Class VI or better, according to the most current Best's Key Rating Guide.

3.12.4. *Required Coverage.* The City shall be an Additional Insured under this Contract, and all policies, except Professional Liability and Worker's Compensation, shall explicitly name the City as an Additional Insured. The City shall enjoy the same coverage as the Named Insured without regard to other Contract provisions. Contactor waives any claim or right of subrogation to recover against the City, its officers, agents, or employees, and each of Contractor's insurance policies except professional liability must contain coverage waiving such claim. Each policy, except Workers' Compensation and Professional Liability, must also contain an endorsement that the policy is primary to any other insurance available to the Additional Insured with respect to claims arising under this Contract. If professional liability coverage is written on a "claims made" basis, Contractor shall also provide proof of renewal each year for two years after substantial completion of the Project, or in the alternative: evidence of extended reporting period coverage for a period of two years after substantial completion, or a project liability policy for the Project covered by this Contract with a duration of two years after substantial completion.

3.12.5. *Notice.* **CONTRACTOR SHALL GIVE 30 DAYS' ADVANCE WRITTEN NOTICE TO THE DIRECTOR IF ANY OF ITS INSURANCE POLICIES ARE CANCELED OR NON-RENEWED**. Within the 30-day period, Contractor shall provide other suitable policies in order to maintain the required coverage. If Contractor does not comply with this requirement, the Director, at his or her sole discretion, may immediately suspend Contractor from any further performance under this Agreement and begin procedures to terminate for default.

3.13. PROFESSIONAL STANDARDS

3.13.1. Contractor's performance shall conform to the professional standards prevailing in the United States with respect to the scope, quality, due diligence, and care of the services and products Contractor provides under this Agreement.

3.14. WARRANTIES

3.14.1. *Generally*

3.14.1.1. Contractor warrants that it shall perform all work in a good and workmanlike manner, meeting the standards of quality prevailing in Harris County, Texas, for work of this kind. Contractor shall perform all work using trained and skilled persons having substantial experience performing the work required under this Agreement.

3.14.1.2. With respect to any Equipment and Services it furnishes, Contractor warrants:

3.14.1.2.1. that all items are free of defects in title, design, material, and workmanship;

3.14.1.2.2. that each item meets or exceeds the manufacturer's specifications and requirements for the equipment, structure, or other improvement in which the item is installed;

3.14.1.2.3. that each replacement item is new, in accordance with original equipment manufacturer's specifications, and of a quality at least as good as the quality of the item which it replaces (when the replaced item was new); and

3.14.1.2.4. that no item or its use infringes any patent, copyright, or proprietary right.

3.14.2. *Manufacturer's Specifications*

3.14.2.1. Contractor warrants that all Equipment and Services are free of defects in material and workmanship and that they will perform in accordance with manufacturer's specifications for a period of four years after the City's Acceptance.

3.14.3. *Manufacturer's Warranties*

3.14.3.1. Contractor hereby assigns to the City all manufacturer's warranties on all Equipment and Services furnished by Contractor under this Agreement and will deliver all related Documents to the Director within five Business Days after the delivery.

3.15. SPARE PARTS {PART OF RFP?}

3.15.1. Contractor shall provide a list of spare parts required for the continuous operation of the all products, hardware, and/or Equipment furnished by Contractor under this Agreement. The list must include estimated delivery times. Spare parts must be provided in accordance with the manufacturer's specifications and must be priced, including discounts, if any, FOB delivery address for products, hardware, and/or equipment as specified in writing by the

Director. The price must include provisions for suitable packing for shipment and storage. Contractor shall submit the spare parts lists at least 30 days before shipment of any products, hardware, and/or equipment under this Agreement.

3.15.2. Contractor shall maintain a fully-stocked inventory of all spare parts required for any Equipment furnished by Contractor under this Agreement. Contractor shall constantly replenish the inventory as parts are used for maintenance services.

3.15.3. If Contractor uses all practicable means to comply with **Subsection 3.15.2** above, but is unable to complete any maintenance services because of a lack of spare parts, the Director may, on Contractor's written request, allow a longer period of time for the completion of the maintenance services.

3.16. INTENTIONALLY OMITTED

3.17. INTENTIONALLY OMITTED

3.18. INTENTIONALLY OMITTED

3.19. ACCEPTANCE AND REJECTION

3.19.1. Contractor shall not be entitled to payment and the City shall have no duty to pay Contractor unless the Director has Accepted the Equipment and Services as set forth in **Exhibit A**.

3.19.2. Contractor shall provide written notice to the Director upon completion and/or delivery of the Equipment, Services and Deliverables as set forth in **Exhibit A**. The Director shall Accept in writing such Equipment, Services and Deliverables on or before the 20th Business Day after the date of receipt of any such Equipment or Services by the Director unless, prior to such 20th Business Day, the Director sends written notice to Contractor stating the reason(s) why any Equipment, Services, or Deliverables have been rejected and not Accepted.

3.19.3. Notwithstanding anything to the contrary in **Exhibit A** or elsewhere, the Director may, in his sole discretion, partially Accept in writing any divisible part of the Equipment, Services, or Deliverables set forth in **Exhibit A**.

3.19.4. If the Director rejects any Equipment, Services or Deliverables, Contractor shall have 10 Business Days after the Director sends written notice of rejection to correct or otherwise replace such Equipment, Services, or Deliverables as necessary to conform to this Agreement, at no additional cost to the City. Contractor shall provide written notice to the Director upon completion of any such correction(s) or replacement(s) after the receipt of which the Director shall continue to either Accept or reject (as provided under this Section) and Contractor shall continue to make any necessary correction(s) or replacement(s) (as provided under this Section) until the Director Accepts in writing all

previously rejected Equipment, Services, or Deliverables.

3.19.5. Notwithstanding anything to the contrary herein or elsewhere, if the Director does not Accept any Equipment, Services or Deliverables after one or more attempted correction(s) or replacement(s) of such Equipment, Services or Deliverables by Contractor, the Director may, in his sole discretion, issue a final rejection notice to Contractor for all Equipment, Services or Deliverables (whether or not previously Accepted), and the City shall return all the rejected Equipment, Services, or Deliverables to Contractor at no cost to the City, and the City shall have no obligation to pay any amount whatsoever under this Agreement, Contractor shall immediately refund any and all amounts paid by City under this Agreement.

3.19.6. The City reserves all other available rights and remedies at law or in equity, including without limitation all rights and remedies and rights under Article 2 of the Texas Business and Commercial Code.

3.20. INTENTIONALLY OMITTED

3.21. CONFIDENTIALITY

3.21.1. Except as otherwise provided in this Agreement, each Receiving Party shall:

3.21.1.1. Hold all Confidential Information of a Disclosing Party in strict confidence;

3.21.1.2. Protect all Confidential Information of a Disclosing Party with at least the same degree of care and in accordance with the security regulations by which it protects its own Confidential Information;

3.21.1.3. Not use, reproduce, or copy any Confidential Information of a Disclosing Party except as necessary for purposes of performing any duties or exercising any rights under, pursuant to, or in connection with this Agreement unless the Disclosing Party otherwise agrees in writing;

3.21.1.4. Not disclose any Confidential Information of a Disclosing Party to any person or entity except the Receiving Party's agents, contractors, employees, and representatives with a need to know for purposes of performing any duties or exercising any rights under, pursuant to, or in connection with this Agreement unless the Disclosing Party otherwise agrees in writing;

3.21.1.5. Not remove any Confidential Information of a Disclosing Party from the continental United States;

3.21.1.6. Return or destroy all Confidential Information of a Disclosing Party and

any copies of such Confidential Information upon request of the Disclosing Party and, in any event, when no longer needed or permitted for use under, pursuant to, or in connection with this Agreement; and

3.21.1.7. Advise its agents, contractors, employees, and representatives of their obligations with respect to the Confidential Information of a Disclosing Party.

3.21.2. No Receiving Party shall have any obligation under this Section (Confidentiality) as to any Confidential Information of a Disclosing Party that:

3.21.2.1. Was previously known to it free and clear of any obligation to keep it confidential;

3.21.2.2. Except as otherwise provided under this Agreement, is disclosed to third parties by the Disclosing Party without restriction;

3.21.2.3. Is or becomes publicly available by other than unauthorized disclosure;

3.21.2.4. Is independently developed by it; or

3.21.2.5. Is disclosed in response to requests made under the Texas Public Information Act or a court order. However, the Receiving Party ordered to disclose the Confidential Information shall: (i) give the Disclosing Party of the Confidential Information prompt written notice of all such requests, and (ii) cooperate with the Disclosing Party's efforts to obtain a protective order protecting the Confidential Information from disclosure.

3.21.3. No Receiving Party shall be liable for the inadvertent or accidental disclosure of Confidential Information of a Disclosing Party, if the disclosure occurs despite the exercise of a reasonable degree of care, which is at least as great as the care the Receiving Party normally takes to protect its own Confidential Information of a similar nature.

3.21.4. Contractor shall obtain written agreements from its agents, employees, contractors, and subcontractors that bind them to the terms of this Section (Confidentiality).

3.22. LICENSES AND PERMITS

3.22.1. Contractor shall obtain, maintain, and pay for all licenses, permits, and certificates including all professional licenses required by any statute, ordinance, rule, or regulation. Contractor shall immediately notify the Director of any suspension, revocation, or other detrimental action against his or her license.

3.23. COMPLIANCE WITH LAWS

3.23.1. Contractor shall comply with all applicable state and federal laws and regulations and the City Charter and Code of Ordinances.

3.24. COMPLIANCE WITH EQUAL OPPORTUNITY ORDINANCE

3.24.1. Contractor shall comply with the City's Equal Employment Opportunity Ordinance as set out in Section 15-17 of the Code of Ordinances.

3.25. MWBE COMPLIANCE

3.25.1. It is the City's policy to ensure that Minority and Women Business Enterprises ("MWBEs") have the full opportunity to compete for and participate in City contracts. The objectives of Chapter 15, Article V of the City of Houston Code of Ordinances, relating to City-wide percentage goals for contracting with MWBEs, are incorporated into this Agreement.

3.25.2. Contractor shall make good faith efforts to award subcontracts in at least **____%** of the value of this Agreement to MWBEs. The City's policy does not require Contractor to in fact meet or exceed this goal, but it does require Contractor to objectively demonstrate that it has made good faith efforts to do so. To this end, Contractor shall maintain records showing:

3.25.2.1. subcontracts and supply agreements with Minority Business Enterprises,

3.25.2.2. subcontracts and supply agreements with Women's Business Enterprises, and

3.25.2.3. specific efforts to identify and award subcontracts and supply agreements to MWBEs.

3.25.3. Contractor shall submit periodic reports of its efforts under this Section to the City Office of Business Opportunity Director in the form and at the times he or she prescribes.

3.25.4. Contractor shall require written subcontracts with all MWBE subcontractors and suppliers and shall submit all disputes with or among MWBE subcontractors to mediation in Houston, Texas, if directed to do so by the City Office of Business Opportunity Director.

3.26. DRUG ABUSE DETECTION AND DETERRENCE

3.26.1. It is the policy of the City to achieve a drug-free workforce and workplace. The manufacture, distribution, dispensation, possession, sale, or use of illegal drugs or alcohol by Contractors while on City Premises is prohibited. Contractor shall comply with all the requirements and procedures set forth in the Mayor's Drug

Abuse Detection and Deterrence Procedures for Contractors, Executive Order No. 1-31 ("Executive Order"), which is incorporated into this Agreement and is on file in the City Secretary's Office.

3.26.2. Before the City signs this Agreement, Contractor shall file with the City Contract Compliance Officer for Drug Testing ("CCODT"):

3.26.2.1. a copy of its drug-free workplace policy,

3.26.2.2. the Drug Policy Compliance Agreement substantially in the form set forth in **Exhibit D**, together with a written designation of all safety impact positions and,

3.26.2.3. if applicable (e.g. no safety impact positions), the Certification of No Safety Impact Positions, substantially in the form set forth in **Exhibit E**.

3.26.3. If Contractor files a written designation of safety impact positions with its Drug Policy Compliance Agreement, it also shall file every six months during the performance of this Agreement (or on completion of this Agreement if performance is less than 6 months), a Drug Policy Compliance Declaration in a form substantially similar to **Exhibit F**. Contractor shall submit the Drug Policy Compliance Declaration to the CCODT within 30 days of the expiration of each 6-month period of performance and within 30 days of completion of this Agreement. The first six-month period begins to run on the date the City issues its Notice to Proceed or, if no Notice to Proceed is issued, on the first day Contractor begins work under this Agreement.

3.26.4. Contractor also shall file updated designations of safety impact positions with the CCODT if additional safety impact positions are added to Contractor's employee work force.

3.26.5. Contractor shall require that its subcontractors comply with the Executive Order, and Contractor shall secure and maintain the required documents for City inspection.

3.27. CONTRACTOR'S PERFORMANCE

3.27.1. To be added

3.28. PAY OR PLAY

3.28.1. The requirements and terms of the City of Houston Pay or Play program, as set out in Executive Order 1-7, as revised from time to time, are incorporated into this Agreement for all purposes. Contractor has reviewed Executive Order No. 1-7, as revised, and shall comply with its terms and conditions as they are set out at the time of City Council approval of this Agreement.

ARTICLE 4. DUTIES OF CITY

4.1. PAYMENT TERMS

1.1.1. The City shall pay and Contractor shall accept fees set forth in **Exhibit B** as full compensation for all Equipment, Services, and Deliverables furnished by Contractor under this Agreement. The fees must be paid from allocated funds as provided in **Section 4.5.,** inclusive of all sections therein.

1.2. EXPENSES AND REIMBURSEMENT

4.2.1. The City will not pay Contractor for any expenses incurred by the Contractor or any subcontractors related to this Agreement.

4.3. TAXES

4.3.1. The City is exempt from payment of Federal Excise and Transportation Tax and Texas Limited Sales and Use Tax. Contractor's invoices to the City must not contain assessments of any of these taxes. The Director will furnish the City's exemption certificate and federal tax identification number to Contractor if requested.

4.4. METHOD OF PAYMENT

4.4.1. The City shall pay Contractor on the basis of invoices submitted by Contractor and approved by the Director showing the Equipment, Services and Deliverables provided under this Agreement. The City shall make payments to Contractor at its address for notices within 30 days of receipt of an approved invoice.

4.4.2. If the Director disputes an invoice Contractor submits for any reason, including lack of supporting documentation (as may be required by the Director in his sole discretion), the Director shall temporarily delete the disputed item and pay the remainder of the invoice. The Director shall promptly notify Contractor of the dispute and request remedial action. After the dispute is settled, Contractor shall include the disputed amount on a subsequent regularly scheduled invoice or on a special invoice for the disputed item only.

4.5. LIMIT OF APPROPRIATION

4.5.1. The City's duty to pay money to Contractor under this Agreement is limited in its entirety by the provisions of this Section.

4.5.2. In order to comply with Article II, Sections 19 and 19a of the City's Charter and Article XI, Section 5 of the Texas Constitution, the City has appropriated and allocated **$_____** to pay money due under this Agreement (the "Original Allocation"). The executive and legislative officers of the City, in their

discretion, may allocate supplemental funds for this Agreement, but they are not obligated to do so. Therefore, the Parties have agreed to the following procedures and remedies:

4.5.2.1. The City makes a Supplemental Allocation by issuing to Contractor a Service Release Order, or similar form approved by the City Controller, containing the language set out below. When necessary, the Supplemental Allocation shall be approved by motion or ordinance of City Council.

NOTICE OF SUPPLEMENTAL ALLOCATION OF FUNDS
By the signature below, the City Controller certifies that, upon the request of the Director, the supplemental sum set out below has been allocated for the purposes of the Agreement out of funds appropriated for this purpose by the City Council of the City of Houston. This supplemental allocation has been charged to such appropriation. $ _____

4.5.2.2. The Original Allocation plus all supplemental allocations are the "Allocated Funds". Funds are not allocated unless and until the funds have been (i) approved by the City Attorney and (ii) certified by the City Controller as required by Article II, Section 19a of the City Charter, notwithstanding any delegation of authority by City Council. This Agreement is not an allocation of funds. The City shall never be obligated to pay any money under this Agreement in excess of the Allocated Funds. Contractor must assure itself that sufficient allocations have been made to pay for Services it provides. If Allocated Funds are exhausted, Contractor's only remedy is suspension or termination of its performance under this Agreement, and it has no other remedy in law or in equity against the City and no right to damages of any kind.

4.6. CHANGES

4.6.1. At any time during the Agreement Term, the Director may issue a Change Order to increase or decrease the Equipment, Services, or Deliverablesas he or she may find necessary to accomplish the general purposes of this Agreement. Contractor shall furnish the Equipment, Services or Deliverables in the Change Order in accordance with the requirements of this Agreement plus any special provisions, specifications, or special instructions issued to execute the extra work. Any Change in **Exhibit A** shall be mutually agreed to prior to the issuance of a Change Order.

4.6.2. The Director will issue the Change Order in substantially the following form:

SAMPLE – SUBJECT TO CHANGE

CHANGE ORDER	
TO:	[Name of Contractor]
FROM:	City of Houston, Texas (the "City")
DATE:	[Date of Notice]
SUBJECT:	Change Order under the Agreement between the City and [Name of Contractor] countersigned by the City Controller on [Date of countersignature of the Agreement]

Subject to all terms and conditions of the Agreement, the City requests that Contractor provide the following:

[Here describe the additions to or changes to the equipment or services and the Change Order Charges applicable to each.]

Signed:

[Signature of Director]

4.6.3. The Director may issue more than one Change Order, subject to the following limitations:

4.6.3.1. Council expressly authorizes the Director to approve a Change Orders up to $50,000. A Change Order of more than $50,000 must be approved by the City Council.

4.6.3.2. If a Change Order describes items that Contractor is otherwise required to provide under this Agreement, the City is not obligated to pay any additional money to Contractor.

4.6.3.3. The Total of all Change Orders issued under this Section may not increase the Original Agreement amount by more than 25%.

4.6.4. Whenever a Change Order is issued and executed by both Parties, Contractor shall furnish all material, equipment, and personnel necessary to perform the work described in the Change Order. Contractor shall complete the work within the time prescribed. If no time for completion is prescribed, Contractor shall complete the work within a reasonable time. If the work described in any Change Order causes an unavoidable delay in any other work Contractor is required to perform under this Agreement, Contractor may request a time extension for the completion of the work. The Director's decision regarding a time extension is final.

4.6.5. Equipment, Services, or Deliverables provided under a Change Order are subject to inspection, acceptance, or rejection in the same manner as the work described in the Original Agreement, and is subject to the terms and conditions of the Original Agreement as if it had originally been a part of the Agreement.

4.6.6. Change Orders are subject to the Allocated Funds provisions of this Agreement.

4.7. ACCESS TO DATA

4.7.1. The City shall, to the extent permitted by law, allow Contractor to access and make copies of documents (including electronically stored information) in the possession or control of the City or available to it that are reasonably necessary for Contractor to perform under this Agreement.

4.7.2. The City does not, however, represent that all existing conditions are fully documented, nor is the City obligated to develop new documentation for Contractor's use.

4.7.3. For any raw data created, assembled, used, maintained, collected, or stored by the Contractor for or on behalf of the City, Contractor shall provide the City either the raw data itself or the ability to extract the raw data in a format mutually agreed upon by both parties at no additional cost to the City.

4.8. NO QUANTITY GUARANTEE

4.8.1. This Agreement does not create an exclusive right in Contractor. The City may procure and execute contracts with other firms for the same, similar, or additional deliverables as those set forth in this Agreement or any Change Order.

4.8.2. The City makes no express or implied representations, warranties, or guarantees whatsoever, that any particular quantity, type, task area, or dollar amount of any Equipment, Services, or Deliverables will be procured or purchased from Contractor through this Agreement or any Change Order; nor does the City make any express or implied representations, warranties, or guarantees, whatsoever for the amount or value of revenue that Contractor may ultimately derive from or through this Agreement or any Change Order.

ARTICLE 5. TERM AND TERMINATION

5.1. TERM

5.1.1. This Agreement is effective on the date of the Effective Date and expires _____ years thereafter, unless sooner terminated in accordance with the terms and conditions of this Agreement.

5.2. RENEWALS

5.2.1. If the Director, at his sole discretion, makes a written request for renewal to

Contractor at least 30 days before expiration of the then-current term and if sufficient funds are allocated, then, upon expiration of the initial term, this Agreement is renewed for _____ successive _____-year terms upon the same terms and conditions.

5.3. TERMINATION FOR CONVENIENCE BY THE CITY

5.3.1. The Director may terminate this Agreement at any time by giving 30 days written notice to Contractor. The City's right to terminate this Agreement for convenience is cumulative of all rights and remedies which exist now or in the future.

5.3.2. On receiving the notice, Contractor shall, unless the notice directs otherwise, immediately discontinue all Services under this Agreement and cancel all existing orders and subcontracts that are chargeable to this Agreement. As soon as practicable after receiving the termination notice, Contractor shall submit a final invoice marked "FINAL" showing in detail the Equipment, Services, or Deliverables performed under this Agreement up to the termination date.

5.3.3. TERMINATION OF THIS AGREEMENT AND RECEIPT OF PAYMENT FOR SERVICES RENDERED, IF ANY, ARE CONTRACTOR'S ONLY REMEDIES FOR THE CITY'S TERMINATION FOR CONVENIENCE, WHICH DOES NOT CONSTITUTE A DEFAULT OR BREACH OF THIS AGREEMENT. CONTRACTOR WAIVES ANY CLAIM (OTHER THAN ITS CLAIM FOR PAYMENT AS SPECIFIED IN THIS SECTION), IT MAY HAVE NOW OR IN THE FUTURE FOR FINANCIAL LOSSES OR OTHER DAMAGES RESULTING FROM THE CITY'S TERMINATION FOR CONVENIENCE.

5.4. TERMINATION FOR CAUSE BY THE CITY

5.4.1. If Contractor defaults under this Agreement, the Director may either terminate this Agreement or allow Contractor to cure the default as provided below. The City's right to terminate this Agreement for Contractor's default is cumulative of all rights and remedies which exist now or in the future. Default by Contractor occurs if:

5.4.1.1. Contractor fails to perform any of its material duties under this Agreement;

5.4.1.2. Contractor becomes insolvent;

5.4.1.3. all or a substantial part of Contractor's assets are assigned for the benefit of its creditors; or

5.4.1.4. a receiver or trustee is appointed for Contractor.

5.4.2. If a default occurs, the Director may, but is not obligated to, deliver a written notice to Contractor describing the default and the termination date. The Director,

at his sole option, may extend the termination date to a later date. If the Director allows Contractor to cure the default and Contractor does so to the Director's satisfaction before the termination date, then the termination is ineffective. If Contractor does not cure the default before the termination date, then the Director may terminate this Agreement on the termination date and pay Contractor for all Services performed, if any, through such date.

5.4.3. To effect final termination, the Director must notify Contractor in writing. After receiving the notice, Contractor shall, unless the notice directs otherwise, immediately discontinue all work (Equipment, Services, and Deliverables) under this Agreement, and promptly cancel all orders or subcontracts chargeable to this Agreement.

5.5. REMOVAL OF CONTRACTOR-OWNED EQUIPMENT AND MATERIALS

5.5.1. Upon expiration or termination of this Agreement, Contractor is permitted 10 days within which to remove Contractor-owned material and equipment from the City's premises. The City shall make such material and equipment readily available to Contractor. The time period may be extended upon approval by the Director. The Director reserves the right to deny any extension of time.

ARTICLE 6. MISCELLANEOUS

6.1. INDEPENDENT CONTRACTOR

6.1.1. Contractor shall perform its obligations under this Agreement as an independent contractor and not as an employee of the City.

6.2. FORCE MAJEURE

6.2.1. Timely performance by both Parties is essential to this Agreement. However, neither Party is liable for reasonable delays in performing its obligations under this Agreement to the extent the delay is caused by Force Majeure that directly impacts the City or Contractor. The event of Force Majeure may permit a reasonable delay in performance but does not excuse a Party's obligations to complete performance under this Agreement. Force Majeure means: fires, interruption of utility services, epidemics in the City, floods, hurricanes, tornadoes, ice storms and other natural disasters, explosions, war, terrorist acts against the City or Contractor, riots, court orders, and the acts of superior governmental or military authority, and which the affected Party is unable to prevent by the exercise of reasonable diligence. The term does not include any changes in general economic conditions such as inflation, interest rates, economic downturn or other factors of general application; or an event that merely makes performance more difficult, expensive or impractical. Force Majeure does not entitle Contractor to any reimbursement of expenses or any other payment whatsoever.

6.2.2. This relief is not applicable unless the affected Party does the following:

6.2.2.1. uses due diligence to remove the effects of the Force Majeure as quickly as possible and to continue performance notwithstanding the Force Majeure; and

6.2.2.2. provides the other Party with prompt written notice of the cause and its anticipated effect.

6.2.3. The Director will review claims that a Force Majeure that directly impacts the City or Contractor has occurred and render a written decision within 14 days. The decision of the Director is final.

6.2.4. The City may perform contract functions itself or contract them out during periods of Force Majeure. Such performance is not a default or breach of this Agreement by the City.

6.2.5. If the Force Majeure continues for more than five days from the date performance is affected, the Director may terminate this Agreement by giving seven days' written notice to Contractor. This termination is not a default or breach of this Agreement. **CONTRACTOR WAIVES ANY CLAIM IT MAY HAVE FOR FINANCIAL LOSSES OR OTHER DAMAGES RESULTING FROM THE TERMINATION EXCEPT FOR AMOUNTS DUE UNDER THE AGREEMENT UP TO THE TIME THE WORK IS HALTED DUE TO FORCE MAJEURE.**

6.2.6. Contractor is not relieved from performing its obligations under this Agreement due to a strike or work slowdown of its employees. Contractor shall employ only fully trained and qualified personnel during a strike.

6.3. SEVERABILITY

6.3.1. If any part of this Agreement is for any reason found to be unenforceable, all other parts remain enforceable unless the result materially prejudices either Party.

6.4. ENTIRE AGREEMENT

6.4.1. This Agreement merges the prior negotiations and understandings of the Parties and embodies the entire agreement of the Parties. No other agreements, assurances, conditions, covenants (express or implied), or other terms of any kind, exist between the Parties regarding this Agreement.

6.5. WRITTEN AMENDMENT

6.5.1. Unless otherwise specified elsewhere in this Agreement, this Agreement may be amended only by written instrument executed on behalf of the City (by authority of an ordinance adopted by the City Council) and Contractor. The Director is

only authorized to perform the functions specifically delegated to him or her in this Agreement.

6.6. APPLICABLE LAWS

6.6.1. This Agreement is subject to the laws of the State of Texas, the City Charter and Ordinances, the laws of the federal government of the United States, and all rules and regulations of any regulatory body or officer having jurisdiction.

6.6.2. Venue for any litigation relating to this Agreement is Harris County, Texas.

6.7. NOTICES

6.7.1. All notices to either Party to the Agreement must be in writing and must be delivered by hand, facsimile, United States registered or certified mail, return receipt requested, United States Express Mail, Federal Express, Airborne Express, UPS or any other national overnight express delivery service. The notice must be addressed to the Party to whom the notice is given at its address set out in Section 1.1. of this Agreement or other address the receiving Party has designated previously by proper notice to the sending Party. Postage or delivery charges must be paid by the Party giving the notice.

6.8. CAPTIONS

6.8.1. Captions contained in this Agreement are for reference only, and, therefore, have no effect in construing this Agreement. The captions are not restrictive of the subject matter of any section in this Agreement.

6.9. NON-WAIVER

6.9.1. If either Party fails to require the other to perform a term of this Agreement, that failure does not prevent the Party from later enforcing that term and all other terms. If either Party waives the other's breach of a term, that waiver does not waive a later breach of this Agreement.

6.9.2. An approval by the Director, or by any other employee or agent of the City, of any part of Contractor's performance does not waive compliance with this Agreement or establish a standard of performance other than that required by this Agreement and by law. The Director is not authorized to vary the terms of this Agreement.

6.10. INSPECTIONS AND AUDITS

6.10.1. City representatives may perform, or have performed, (i) audits of Contractor's books and records, and (ii) inspections of all places where work is undertaken in connection with this Agreement. Contractor shall keep its books and records available for this purpose for at least four years after this Agreement terminates.

This provision does not affect the applicable statute of limitations.

6.11. ENFORCEMENT

6.11.1. The City Attorney may enforce all legal rights and obligations under this Agreement without further authorization. Contractor shall provide to the City Attorney all documents and records that the City Attorney requests to assist in determining Contractor's compliance with this Agreement, with the exception of those documents made confidential by federal or State law or regulation.

6.12. AMBIGUITIES

6.12.1. If any term of this Agreement is ambiguous, it shall not be construed for or against any Party on the basis that the Party did or did not write it.

6.13. SURVIVAL

6.13.1. Contractor shall remain obligated to the City under all clauses of this Agreement that expressly or by their nature extend beyond the expiration or termination of this Agreement, including but not limited to, the indemnity provisions.

6.14. PUBLICITY

6.14.1. Contractor shall make no announcement or release of information concerning this Agreement unless the release has been submitted to and approved, in writing, by the Director.

6.15. RISK OF LOSS

6.15.1. Unless otherwise specified elsewhere in this Agreement, risk of loss or damage for each piece of Equipment, Service, or Deliverable passes from Contractor to the City upon Acceptance by the City.

6.16. PARTIES IN INTEREST

6.16.1. This Agreement does not bestow any rights upon any third party, but binds and benefits the City and Contractor only.

6.17. SUCCESSORS AND ASSIGNS

6.17.1. This Agreement binds and benefits the Parties and their legal successors and permitted assigns; however, this provision does not alter the restrictions on assignment and disposal of assets set out in **Section 6.18**. This Agreement does not create any personal liability on the part of any officer or agent of the City.

6.18. BUSINESS STRUCTURE AND ASSIGNMENTS

6.18.1. Contractor shall not assign this Agreement at law or otherwise or dispose of all or substantially all of its assets without the Director's prior written consent. Nothing in this clause, however, prevents the assignment of accounts receivable or the creation of a security interest as described in Section 9.406 of the Texas Business & Commerce Code. In the case of such an assignment, Contractor shall immediately furnish the City with proof of the assignment and the name, telephone number, and address of the Assignee and a clear identification of the fees to be paid to the Assignee.

6.18.2. Contractor shall not delegate any portion of its performance under this Agreement without the Director's prior written consent which consent shall not be unreasonably withheld.

6.19. DISPUTE RESOLUTION

6.19.1. For purposes of this Section "Project Administrator" means the person the Director designates to monitor the progress of all Parties' performance under this Agreement.

6.19.2. Except as may otherwise be provided by law, a dispute that (i) does not involve a question of law; (ii) arises during the performance of this Agreement; and (iii) is not resolved between the Project Administrator and Contractor must be handled as described below:

6.19.2.1. The Project Administrator shall put its decision in writing and mail or otherwise furnish Contractor with a copy. Contractor may abide by the decision or may appeal the decision to the Director.

6.19.2.2. If Contractor desires to appeal a decision of the Project Administrator, Contractor must submit a written appeal to the Director. Contractor must file its written appeal within seven Business Days following receipt of the Project Administrator's original decision. The Director shall provide Contractor with a written response to the appeal within 14

Business Days following its receipt. The decision of the Director is final.

6.20. REMEDIES CUMULATIVE

6.20.1. Unless otherwise specified elsewhere in this Agreement, the rights and remedies contained in this Agreement are not exclusive, but are cumulative of all rights and remedies which exist now or in the future. Neither Party may terminate its duties under this Agreement except in accordance with its provisions.

6.21. CONTRACTOR DEBT

6.21.1. IF CONTRACTOR, AT ANY TIME DURING THE TERM OF THIS AGREEMENT, INCURS A DEBT, AS THE WORD IS DEFINED IN SECTION 15-122 OF THE HOUSTON CITY CODE OF ORDINANCES, IT SHALL IMMEDIATELY NOTIFY THE CITY CONTROLLER IN WRITING. IF THE CITY CONTROLLER BECOMES AWARE THAT CONTRACTOR HAS INCURRED A DEBT, SHE SHALL IMMEDIATELY NOTIFY CONTRACTOR IN WRITING. IF CONTRACTOR DOES NOT PAY THE DEBT WITHIN 30 DAYS OF EITHER SUCH NOTIFICATION, THE CITY CONTROLLER MAY DEDUCT FUNDS IN AN AMOUNT EQUAL TO THE DEBT FROM ANY PAYMENTS OWED TO CONTRACTOR UNDER THIS AGREEMENT, AND CONTRACTOR WAIVES ANY RECOURSE THEREFOR. CONTRACTOR SHALL FILE A NEW AFFIDAVIT OF OWNERSHIP, USING THE FORM DESIGNATED BY CITY, BETWEEN FEBRUARY 1 AND MARCH 1 OF EVERY YEAR DURING THE TERM OF THIS AGREEMENT.

SAMPLE – SUBJECT TO CHANGE

EXHIBIT A

EQUIPMENT, SERVICES, DELIVERABLES

SAMPLE – SUBJECT TO CHANGE

EXHIBIT B

COST/FEES

SAMPLE – SUBJECT TO CHANGE

EXHIBIT C

KEY PERSONNEL [may not be required in this contract]

SAMPLE – SUBJECT TO CHANGE

EXHIBIT D

DRUG POLICY COMPLIANCE AGREEMENT

I, _____ as an owner or officer of
(Name) (Print/Type) (Title)

_____ (Contractor)
(Name of Company)

have authority to bind Contractor with respect to its bid, offer or performance of any and all contracts it may enter into with City of Houston; and that by making this Contract, I affirm that Contractor is aware of and by the time the contract is awarded will be bound by and agree to designate appropriate safety impact positions for company employee positions, and to comply with the following requirements before City issues a notice to proceed:

1. Develop and implement a written Drug Free Workplace Policy and related drug testing procedures for Contractor that meet the criteria and requirements established by the Mayor's Amended Policy on Drug Detection and Deterrence (Mayor's Drug Policy) and the Mayor's Drug Detection and Deterrence Procedures for Contractors (Executive Order No. 1-31).

2. Obtain a facility to collect urine samples consistent with Health and Human Services (HHS) guidelines and a HHS certified drug testing laboratory to perform the drug tests.

3. Monitor and keep records of drug tests given and the results; and upon request from City of Houston, provide confirmation of such testing and results.

4. Submit semi-annual Drug Policy Compliance Declarations.

I affirm on behalf of Contractor that full compliance with the Mayor's Drug Policy and Executive Order No. 1-31 is a material condition of the contract with City of Houston.

I further acknowledge that falsification, failure to comply with or failure to timely submit declarations and/or documentation in compliance with the Mayor's Drug Policy and/or Executive Order No. 1-31 will be considered a breach of the contract with City and may result in non-award or termination of the contract by City of Houston.

_____
Date

_____
Contractor Name

_____
Signature

_____
Title

SAMPLE – SUBJECT TO CHANGE

EXHIBIT E
CONTRACTOR'S CERTIFICATION
OF NO SAFETY IMPACT POSITIONS
IN PERFORMANCE OF A CITY CONTRACT

I, _____ , _____, (Contractor)
(Name) (Title)

as an owner or officer of _____ have authority to bind
(Name of Company)
Contractor with respect to its bid, and hereby certify that Contractor has no employee safety impact positions, as defined in Section 5.18 of Executive Order No. 1-31, that will be involved

in performing _____. Contractor
(Project)
agrees and covenants that it shall immediately notify City of Houston Director of Human Resources if any safety impact positions are established to provide services in performing this City Contract.

_____ _____
(Date) (Typed or Printed Name)

_____
(Signature)

_____
Title)

SAMPLE – SUBJECT TO CHANGE

EXHIBIT F

DRUG POLICY COMPLIANCE DECLARATION

I, _____as an owner or officer of
(Name) (Print/Type) (Title)

_____ have personal knowledge and full
(Contractor - Name of Company)
authority to make the following declarations:

This reporting period covers the preceding 6 months from _____ to _____, 20 _____.

_____ (Initials) A written Drug Free Workplace Policy has been implemented and employees notified. The policy meets the criteria established by the Mayor's Amended Policy on Drug Detection and Deterrence (Mayor's Policy).

_____ (Initials) Written drug testing procedures have been implemented in conformity with the Mayor's Drug Detection and Deterrence Procedures for Contractors, Executive Order No. 1-31. Employees have been notified of such procedures.

_____ (Initials) Collection/testing has been conducted in compliance with federal Health and Human Services (HHS) guidelines.

_____ (Initials) Appropriate safety impact positions have been designated for employee positions performing on City of Houston contract. The number of employees in safety impact positions during this reporting period is

_____ (Initials) From _____ (Start date) to _____ (End date) the following test has occurred

	RANDOM	*REASONABLE SUSPICION*	*POST ACCIDENT*	*TOTAL*
Number Employees Tested				
Number Employees Positive				
Percent Employees Positive				

_____ (Initials) Any employee who tested positive was immediately removed from the City worksite consistent with the Mayor's Policy and Executive Order No. 1-31.

_____ (Initials) I affirm that falsification or failure to submit this declaration timely in accordance with established guidelines will be considered a breach of contract.

I declare under penalty of perjury that the affirmations made herein and all information contained in this declaration are within my personal knowledge and are true and correct.

_____
(Date)

_____
(Typed or Printed Name)

_____
(Signature)

_____
(Title)

PART XI – PRICE SHEET

PRICE SHEET MUST BE SUBMITTED IN A SEPARATE ENVELOPE MARKED "PRICING"

i. Provide the pricing for all vehicles offered using a **fixed percentage (%) discount off a MANUFACTURER PRICE LIST** or other objectively verifiable criteria using the format below:

1. **Ambulance and Emergency Vehicles, Equipment and Accessories**: Provide pricing for all base vehicles offered. Proposer is required to provide detailed specifications for each base model and options as an Exhibit in its Technical Proposal.

Item No.	Vehicle/Trailer Description	Model Name	Model Number	Catalog/List Price	% Discount off List	Delivered Base Price
1	Type I Ambulance (10,001 to 14,000 GVWR)					
2	Type I Additional Duty Ambulance (14,000 GVWR or more)					
3	Type II Ambulance (9,201 to 10,000 GVWR)					
4	Type III Ambulance (10,001 to 14,000 GVWR)					
5	Type III Additional Duty Ambulance (14,001 GVWR or more)					
	(Use additional space as necessary if Proposer offers additional base vehicles.)					
Item No.	***Options***	**Model Name**	**Model Number**	**Catalog/List Price**	**% Discount off List**	**Delivered Option Price**
	(Use additional space as necessary to provide all available options that may be installed on vehicles.)					

2. **Fire Apparatus Vehicles, Equipment and Accessories:** Provide pricing for all vehicles, equipment and accessories offered. Proposer is required to provide detailed specifications for all vehicles and options as an Exhibit in its Technical Proposal.

Item No.	Product Description	Model Name	Model Number	Catalog/List Price	% Discount off List Price	Discounted Price
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11	*(Use additional space as necessary.)*					
12						
Item No.	***Options***	**Model Name**	**Model Number**	**Catalog/List Price**	**% Discount off List**	**Delivered Option Price**
	(Use additional space as necessary to provide all available options that may be installed on vehicles.)					

3. **Specialty Vehicles, Equipment and Accessories:** Provide pricing for all base vehicles offered. Proposer is required to provide detailed specifications for each base model and options as an Exhibit in its Technical Proposal.

Item No.	Vehicle/Trailer Description	Model Name	Model Number	Catalog/List Price	% Discount off List Price	Delivered Base Price
1	Van - Light Duty (Up to 9,000 lbs. GVWR)					
2	Van - Medium Duty (Up to 14,500 lbs. GVWR)					
3	Truck - Light Duty (Up to 19,500 lbs. GVWR)					
4	Truck - Medium Duty (Up to 26,000 lbs.GVWR)					
5	Truck - Heavy Duty (Up to 33,000 lbs. GVWR)					
6	Truck - Super Heavy Duty (Up to 54,000 lbs. GVWR)					
7	Coach - Light Duty (Up to 26,000 lbs. GVWR)					
8	Coach - Medium Duty (Up to 44,000 lbs. GVWR)					
9	Coach - Heavy Duty (Up to 65,000 lbs. GVWR)					
10	Trailer - Single Axle					
11	Trailer - Multiple Axle					
12	Trailer - Semi					
13	Modular Unit					
	(Use additional space as necessary if Proposer offers additional base vehicles.)					

Item No.	***Options***	Model Name	Model Number	Catalog/List Price	% Discount off List Price	Delivered Option Price
	(Use additional space as necessary to provide all available options that may be installed on vehicles.)					

ii. Provide copies of the MANUFACTURER PRICE LIST or other objectively verifiable criteria.

iii. **Related Supplies and Services:** Provide pricing for any proposed additional products you wish to be considered. Additionally, provide pricing (if applicable) for any services offered by Proposer, including but not limited to, training, vehicle services, preventive maintenance, warranty extensions, repair services, technical support, etc. If any services are offered standard at no additional cost, please note.

iv. **Volume Discounts or Rebates:** Please include any volume discounts or rebates offered by Proposer to Participating Public Agencies.

v. **Delivery:** All freight shall be FOB destination, freight prepaid and included. Any handling fees shall also be included in the pricing.

vi. **Alternative Costing Method:** If a project requires product options that are not covered in the pricing schedule or if a product option is required that is more appropriate to be custom designed and manufactured to meet an individual project application, the Contractor may use the alternative costing method as follows:

- Apply the U.S. Communities discount as submitted on the Pricing Schedule; and
- All products falling under this category must be submitted in advance and approved by the Participating Public Agency prior to being included in any quote or proposal from the Contractor.

vii. **Sample Specification Pricing for Evaluation Purposes:** The Proposer must submit pricing for the Sample Specifications provided in Attachment D – Sample Specification Pricing. Pricing is to be based on pricing quoted on the Price Sheet. Sample Specification Pricing will be used for evaluation purposes.

Ambulance and Emergency Vehicles, Equipment and Accessories Attachment D: Sample Specification Pricing						
Item No.	**Vehicle/Trailer/Options Description**	**Model Name**	**Model Number**	**Catalog/List Price**	**% Discount off List**	**Delivered Base Price**
1	Type I, 12' Houston Fire Department Specification					
	(Use additional space as necessary)					
					TOTAL	
2	Type I, 14' Dodge Ram 4500					
	(Use additional space as necessary)					
					TOTAL	
3	Type III, 12' Chevrolet G3500					
	(Use additional space as necessary)					
					TOTAL	
4	Type III, 14' Chevrolet G4500					
	(Use additional space as necessary)					
					TOTAL	

Fire Apparatus, Equipment and Accessories Attachment D: Sample Specification Pricing						
Item No.	**Vehicle/Trailer/Options Description**	**Model Name**	**Model Number**	**Catalog/List Price**	**% Discount off List**	**Delivered Base Price**
1	Houston Fire Department Engine					
	(Use additional space as necessary)					
					TOTAL	
2	Houston Fire Department Aerial Ladder					
	(Use additional space as necessary)					
					TOTAL	
3	Houston Fire Department Aerial Tower					
	(Use additional space as necessary)					
					TOTAL	

Specialty Vehicles, Equipment and Accessories Attachment D: Sample Specification Pricing						
Item No.	**Vehicle/Trailer/Options Description**	**Model Name**	**Model Number**	**Catalog/List Price**	**% Discount off List**	**Delivered Base Price**
1	Mobile Command Center					
	(Use additional space as necessary)					
					TOTAL	
2	Mobile Medical Unit					
	(Use additional space as necessary)					
					TOTAL	
3	Mobile Classroom/Computer Lab					
	(Use additional space as necessary)					
					TOTAL	
4	Mobile Bookmobile					
	(Use additional space as necessary)					
					TOTAL	

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # A

CITY OF HOUSTON FIRE DEPARTMENT

AMBULANCE VEHICLES SPECIFICATION

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) SOLICITATION NO.: S58-T25507
ATTACHMENT # A

CITY OF HOUSTON FIRE DEPARTMENT AMBULANCE VEHICLES SPECIFICATION

1. SCOPE, PURPOSE, AND CLASSIFICATION

1.1 SCOPE.

This specification covers certified, tested, commercial type, Emergency Medical Services (EMS) ambulances built on OEM chassis that are suitable for the intended application an meet the requirements herein. The ambulances are front or rear wheel driven (4x2) or four wheel driven (4x4) and warranted as specified in Section 6. This document may be used to procure an ambulance and the applicable additional systems and equipment.

1.1.1 DEFINITION OF AMBULANCE.

The ambulance is defined as a vehicle used for emergency medical care that provides:

- A driver's compartment
- A patient compartment to accommodate an emergency medical services provider and one patient located on the primary cot so positioned that the primary patient can be given intensive life-support during transit
- Equipment and supplies for emergency care at the scene as well as during transport
- Safety, comfort, and avoidance of aggravation of the patient's injury or illness
- Two-way radio communication
- Audible and Visual Traffic warning devices

1.1.2 PURPOSE.

The purpose of this document is to describe ambulances that are authorized to display the "Star of Life" symbol. It establishes minimum specifications, test parameters, and essential criteria for ambulance design, performance, equipment, appearance, and to provide a practical degree of standardization. The object is to provide ambulances that are nationally recognized, properly constructed, easily maintained, and, when professionally staffed and provisioned, will function reliably in pre-hospital or other mobile emergency medical service.

1.1.3 "STAR OF LIFE" CERTIFICATION.

The ambulance manufacturer/contractor shall furnish to a Participating Public Agency an authenticated certification and label stating that the ambulance and equipment comply with this specification. Ambulance manufacturers making this certification are permitted to use the "Star of Life" symbol to identify an ambulance as compliant with the Federal specifications for ambulances. Use of the symbol must be in accordance with the purpose and use criteria set forth in published guidelines (Document Number DOT HS 808 721, Rev. June 1995) by the National Highway Traffic Safety Administration, an operating administration of the U.S. Department of Transportation.

1.2 CLASSIFICATION.

1.2.1 AMBULANCE TYPES.

The authorized "Star of Life" ambulances shall be of the types listed in 3.1

2 Applicable Documents

2.1 The following Standards and Regulations form a part of this specification, to the extent specified or required by law. Unless a specific issue of a Standard or Regulation is identified, the issue in effect, on the date the ambulance is contracted for, shall apply.

FEDERAL SPECIFICATIONS:
RR-C-901/3 - Cylinders, Compressed Gas: With Valve or Plug and Cap; ICC3aa.

FEDERAL STANDARDS:
Federal Standard No. 297 - Rust proofing of Automotive Vehicles

LAWS AND REGULATIONS:
29 CFR 1910.1030: Blood borne Pathogens
21 CFR 820: Quality System Regulation
40 CFR 86: Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines.
47 CFR, PART 89: Public Safety Radio Services (FCC)
49 CFR 393: Federal Motor Carrier Safety Regulations (FMCSR)
49 CFR 571: Federal Motor Vehicle Safety Standards (FMVSS)

2.2 OTHER PUBLICATIONS.
The following documents form a part of this specification to the extent specified. Unless a specific issue is identified, the issue in effect, on the date the ambulance is contracted for, shall apply.

STATE OF CALIFORNIA MOTOR VEHICLE CODE

THE TIRE AND RIM ASSOCIATION, INC., YEARBOOK:

NATIONAL FIRE PROTECTION ASSOCIATION
70 – National Electric Code
1901 – Standard for Automotive Fire Apparatus

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE), INC., STANDARDS, AND RECOMMENDED PRACTICES:
J163 - Low Tension Wiring and Cable Terminals and Splice Clips.
J537 - Storage Batteries.
J541 - Voltage Drop for Starting Motor Circuits.
J553 - Circuit Breakers.
J561 - Electrical Terminals, Eyelet, and Spade Type.
J575 - Tests for Motor Vehicle Lighting Devices & Components.
J576 - Plastic Materials, For Use In Optical Parts Such As Lenses and Reflectors of Motor Vehicle Lighting Devices.
J578 - Color Specification for Electric Signal Lighting Devices.
J595 - Flashing Warning Lamps for Authorized Emergency, Maintenance, and Service Vehicles.
J638 - Test Procedure and Ratings for Hot Water Heaters for Motor Vehicles.
J639 - Safety Practices for Mechanical Vapor Compression Refrigeration Equipment or Systems Used To Cool Passenger Compartment of Motor Vehicles.
J689 - Approach, Departure, and Ramp Breakover Angles.
J682 - Rear Wheel Splash and Stone Throw Protection.
J683 - Tire Chain Clearance.

J858 - Electrical Terminals, Blade Type.
J928 - Electrical Terminals, Pin, and Receptacle Type.
J994 - Backup Alarms, Performance Test and Application.
J1054 -Warning Lamp, Alternating Flashers.
J1127 -Battery Cable.
J1128 -Low Tension Primary Cable.
J1292 -Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring.
J1349 -Engine Power Test Code, Spark Ignition and Diesel.
J1318 -Strobe Warning Lights.
J2498 - Minimum Performance of the Warning Light System Used on Emergency Vehicles

NATIONAL TRUCK EQUIPMENT ASSOCIATION / AMD:
AMD Standard 001 - Static Load For Ambulance Body Structure Test.
AMD Standard 003 - Oxygen Tank Retention System Test (Main and Portable Bottles).
AMD Standard 004 - Litter Retention System Test.
AMD Standard 005 - Ambulance 12-Volt DC Electrical Systems Test.
AMD Standard 006 - Sound Level Test Code.
AMD Standard 007 - Carbon Monoxide Levels For Patient Compartment Interiors.
AMD Standard 008 - Ambulance Patient Compartment Grab Rail (Load Test).
AMD Standard 009 - Alternating Current (AC) Electrical Systems.
AMD Standard 010 - Water Spray Test For Ambulances
AMD Standard 011 - Ambulance Equipment Temperature Test
AMD Standard 012 – Ambient Temperature Tests (Heating and Air Conditioning)
AMD Standard 013 - Weight Distribution Test
AMD Standard 014 - Cooling System Test
AMD Standard 015 - Ambulance Main Oxygen System Test
AMD Standard 026 – Ambulance Emergency Lighting System Configuration
AMD Standard Annex to AMD standards

AMERICAN COLLEGE OF EMERGENCY PHYSICIANS (ACEP):
Guidelines for Ambulance Equipment

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS:
F 920 Standard Specification for Minimum Performance and Safety Requirements for Resuscitators Intended for Use with Humans.
F 960 Standard Specification for Medical and Surgical Suction and Drainage Systems

NATIONAL EMSC (Emergency Medical Services for Children) RESOURCE ALLIANCE:
–COMMITTEE ON AMBULANCE EQUIPMENT AND SUPPLIES,
Guidelines for pediatric equipment and supplies for Basic and Advanced life support ambulances

AUTOMOTIVE MANUFACTURERS EQUIPMENT COMPLIANCE AGENCY (AMECA):
Approval of Motor Vehicle Safety Equipment (emergency lights and sirens)

2.3 ORDER OF PRECEDENCE.
In the event of a conflict between the text of this specification and the references cited, the text of this specification shall take precedence.

3 Requirements

3.1 GENERAL VEHICULAR DESIGN, TYPES, AND FLOOR PLAN.

3.1.1 DESIGN.

The ambulance and the allied equipment furnished under this specification shall be the manufacturer's current model year commercial vehicle of the Type and Configuration specified. The ambulance shall be complete with the operating accessories, as specified. The design of the vehicle and the specified equipment shall permit accessibility for servicing, replacement, and adjustment of component parts and accessories with minimum disturbance to other components and systems. The term "heavy-duty", as used to describe an item, shall mean in excess of the standard quantity, quality, or capacity and represents the best, most durable, strongest, etc., part, component, system, etc., that is commercially available on the OEM chassis.

3.1.2 TYPE I AMBULANCE (10,001 to 14,000 GVWR)

Type I vehicle shall be a conventional chassis furnished with a 2-door enclosed cab.

3.1.2.1 TYPE I - AD (Additional Duty) AMBULANCE (14,001 GVWR or More)

Type I-AD (other user specified configurations such as for critical patient or neonatal transport) shall be a Cab-Chassis with integrated modular ambulance body, increased GVWR, storage, and payload.

3.1.3 TYPE II AMBULANCE (9201 – 10,000 GVWR)

Type II ambulance shall be a Van, with Integral Cab-Body

3.1.4 TYPE III AMBULANCE (10,001 to 14,000 GVWR)

Type III shall be a Cutaway Van with integrated modular ambulance body.

3.1.4.1 TYPE III- AD (Additional Duty) AMBULANCE (14,001 GVWR or More)

Type III-AD (includes other user specified configurations such as for critical patient or neonatal transport) shall be a Cutaway Van with integrated modular body, and increased GVWR, storage, and payload.

3.1.5 CONFIGURATION OF PATIENT COMPARTMENT.

Primary cot shall be loaded to position the patient's head forward in the ambulance. The Primary cot shall be mounted to provide maximum access from attendant seating.

3.1.6 FOUR WHEEL DRIVE, CLASS 2, 4x4

When a 4x4 chassis is specified, the additional curb weight of the 4x4 chassis above the 4x2 chassis will reduce the payload proportionally. When available, a Class 2 ambulance shall be an original chassis manufacturer's (OEM) 4x4 chassis for Type 1 ambulances, or an OEM 4x2 model with a professionally engineered conversion to a four when drive (4x4) conforming to all applicable requirement herein. All workmanship, welding, mechanical fit, grade, and quality of components and materials used in conversions shall be equal to or greater than OEM manufacturer's production 4x4 units. Conversion components shall not interfere with other body, chassis, or mechanical parts through the complete range of suspension and wheel angle travel and allow proper alignment of axles. The tracking and wheelbase of the front/rear axles shall be identical on both sides of the vehicle. When available, the chassis manufacturer's OEM components used on the chassis manufacturer's other models with the same or greater GAWRs and GVWRs shall be furnished, including, but not limited to: spring hangers, shackles, drive axle, integral transmission/transfer case, universal joints, steering linkage, stabilizer bars, radius and torque rods, transfer case shaft linkage, brake calipers, pads, rotors, shock absorbers, and springs. When available, the chassis manufacturer's guidelines/requirements for 4x4 conversions

shall be followed. The design of the 4x4 conversion shall minimize the height of the vehicle's chassis. The 4x4 converter shall include a complete chassis modifier FMVSS certification and sticker.

The 4x4 converter shall provide to the Participating Public Agency a full parts and labor warranty covering all added 4x4 parts and materials, including workmanship and design. The warranty shall also cover all OEM components affected or modified by the conversion process. This warranty shall be at least equivalent, in mileage and time, to the OEM chassis manufacturer's warranty, including any extended warranties required or furnished.

Accompanying each conversion shall be complete manuals showing operation, maintenance, and repair procedures, chassis manufacturer's part number, drawings for components used in the conversion, and dimensioned drawings for manufactured parts, alignment procedures, and specifications.

3.2 VEHICLE, AMBULANCE COMPONENTS, EQUIPMENT, AND ACCESSORIES.
The emergency medical care vehicles; including chassis, ambulance body, equipment, devices, medical accessories, and electronic equipment shall be standard commercial products, tested and certified to meet or exceed the requirements of this specification. The ambulance shall comply with all Federal Motor Vehicle Safety Standards (FMVSS) and other Federal and state regulations applicable or specified for the year of manufacture. The chassis, components, and optional items shall be as represented in the chassis manufacturer's current technical data. The ambulance body, equipment, and accessories shall be as represented in their respective manufacturer's current technical data. Data shall be limited to specifications and technical materials identical to that furnished to the authorized company representatives and shall be furnished to the engineering/technical offices of the Participating Public Agency prior to acceptance of the ambulance. The contractor shall provide total standardization and interchangeability between similar vehicles, equipment, items, and accessories specified for all ambulance units under each contract.

3.2.1 MEDICAL DEVICES
All medical devices furnished must be marketed in compliance with FDA regulatory requirements.

3.3 RECOVERED MATERIALS.
All equipment, material, and articles required under this specification are to be new or fabricated from new materials produced from recovered materials. The term "recovered materials" means materials that have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed.

3.4 VEHICLE OPERATION, PERFORMANCE, AND PHYSICAL CHARACTERISTICS.

3.4.1 OPERATION AND PERFORMANCE.
All requirements in section 3.4 shall me met with the ambulance loaded per AMD Standard 017. The vehicle shall be capable of operating safely and efficiently under environmental conditions outlined.

3.4.2 TEMPERATURE CONDITIONS.
The ambulance and equipment shall be operable in ambient temperature ranging from 0°F to 110°F.

3.4.3 NOISE AND SOUND LEVEL LIMITS, EXTERIOR.
Unless more stringent sound levels are regulated by the states and municipalities where the ambulance will be based, the exterior noise level produced by the vehicle, except siren, shall not exceed Federal regulations.

3.4.4 VEHICLE PERFORMANCE.
The ambulance shall provide a smooth, stable ride. When available from the chassis manufacturer automatic vehicle stability control shall be furnished. The ambulance to be certified shall be tested under conditions in and meet the requirements of AMD Standard 017.

3.4.5 BRAKES.
The ambulance braking system as delivered to the user shall comply with performance values required by Federal Motor Vehicle Safety Standards (FMVSS), and shall include ABS and meet the requirements of AMD standard 017

3.4.6 SPEED.
The vehicles shall be capable of a sustained speed of not less than 65 mph over dry, hard surfaced, level roads, at sea level, and passing speeds of 70 mph when tested under normal ambient conditions and meet the requirements of AMD Standard 017.

3.4.7 ACCELERATION.
Vehicle shall have a minimum average acceleration, at sea level, of 0-55 mph within 25 seconds. Test shall be performed under normal ambient conditions and meet the requirements of AMD Standard 017.

3.4.8 GRADEABILITY.
At full GVWR, the vehicle shall be capable of meeting the performance requirements of AMD 017. The determination shall be made by actual test or chassis manufacturer's certified computer prediction.

3.4.8.1 GRADEABILITY AT SPEED.
Minimum grade ability at speed shall be 55 mph on a 3% (1.72 degrees) grade and meet the requirements of AMD Standard 017.

3.4.8.2 MINIMUM LOW SPEED GRADEABILITY.
The minimum low speed grade ability of 5 mph on a 35% (19.3 degrees) grade is required for 4x2 vehicles and 45% (24.2 degrees) grade for 4x4 vehicles and meet the requirements of AMD Standard 017.
.

3.4.9 FUEL RANGE
The ambulance shall be capable of being driven for at least 250 miles without refueling and meet the requirements of AMD Standard 017.

3.4.10 FORDING
The vehicle shall be capable of three fordings, without water entering patient and equipment compartments while being driven through a minimum of 8 in. of water, at speeds of 5 mph, for a distance of at least 100 feet and meet the requirements of AMD Standard 017.

3.4.11 VEHICLE PHYSICAL DIMENSIONAL REQUIREMENTS

3.4.11.1 LENGTH.
Overall length of the ambulance (OAL) shall be specified by the Participating Public Agency, including bumpers, rear step and bumper guards.

3.4.11.2 WIDTH.
The overall (OA) width of ambulance bodies having dual rear wheels shall be a maximum of 96 in., excluding mirrors, lights, and other safety appurtenances.

The ambulance body sides, on a chassis with dual rear wheels, shall be symmetrical and within +/- 2.5 in. of the overall width of the tires (outside sidewalls). The 2.5 inch allowance is not cumulative; it applies individually to each side. Tires shall not extend beyond the fenders.

3.4.11.3 HEIGHT.
The Participating Public Agency shall specify the overall height of the ambulance when loaded per AMD Standard 017. This includes roof-mounted equipment, but excludes two-way radio antenna(s).

3.4.11.4 GROUND CLEARANCE
With the exception of the chassis manufacturer's furnished and installed components, the lowest part of the vehicle, when loaded to the GVWR, shall have a minimum of 8 in. of ground clearance, and 6 in. for chassis mounted components.

3.4.11.5 ANGLE OF APPROACH, RAMP BREAKOVER AND DEPARTURE.
With the exception of the chassis manufacturer's furnished and installed components, the ambulance loaded per AMD Standard 017, shall provide not less than the following clearance, measured in accordance with SAE J689
Approach angle 20 degrees
Ramp breakover 10 degrees
Departure angle 10 degrees

3.4.11.6 TURNING RADIUS.
Turning radius shall not be greater than chassis OEM standard.

3.4.11.7 FLOOR HEIGHT.
The finished floor (loading) height shall be a maximum of 34 in. The height of the floor shall be measured with the vehicle loaded per AMD Standard 017

3.5 VEHICLE WEIGHT RATINGS AND PAYLOAD.

3.5.1 CURB WEIGHT.
Non-permanently mounted equipment is considered to be part of the payload, not the curb weight.

3.5.2 PAYLOAD ALLOWANCE.
The ambulance shall not be operated in an overloaded condition. EMSPs should determine that the actual load, to be placed on the vehicle, does not exceed the total usable payload as manufactured. Any additional items attached to, or carried on the vehicle by the EMSP will reduce the combined weight of occupants and Cargo/Equipment that comprise the total usable payload. Additional weight added, resulting from specified options, will reduce the available payload per vehicle.

Occupant weight shall be accommodated for 175 lbs. for each designated patient and seating position.

The required minimum payload (patients, passengers and cargo/equipment) per vehicle without optional permanently mounted equipment shall be as follows:

1. Single, rear wheeled, van ambulances (Type II). —1500 lbs.

2. Dual, rear wheeled, modular ambulances (Type I or III). —1750 lbs.
3. Additional Duty Modular Ambulances (Type I AD or III AD) —2,250 lbs

Each ambulance's payload capacity, horizontal, lateral, and vertical CG shall be determined. Horizontal and vertical shall be determined by completing an NTEA UltraMod spreadsheet (available at www.ntea.com). A copy of the UltraMod spreadsheet and lateral calculation shall be included in the handbook of instructions. The following shall be shown on the calculations:

1. Completed vehicle at curb weight
2. 175 lbs. at the lateral, horizontal and vertical center of each patient location and at the design H-Point of each designated seating position.
3. The maximum remaining Cargo/Equipment capacity located at the lateral, horizontal and vertical dimensional center of the patient compartment that does not result in weights that exceed the vehicle's weight rating capacities.

The total usable Cargo/Equipment capacity value of Figure 2, item 10 shall be displayed on the certification and payload signage as shown in Figure 1. The label shall be located in a conspicuous location in the ambulance.

FIGURE 1 – Certification & Payload Signage
The label shall be mounted on the body (module) interior in a conspicuous location.

- The label shown here is suggested format.
- Deviations in dimensions are acceptable.
- All text must be included.
- Exceptions, when taken, shall be documented in the handbook of instructions.
- No text shall be added to this label.

CERTIFIED "STAR OF LIFE" AMBULANCE
Date of Manufacture_____
Mfg. By_____
Address_____
City_____ State_____ Zip_____

This ambulance conforms to Federal Specification KKK-A-1822 in effect on the date the ambulance was contracted for.
Exceptions taken? No_____ Yes_____
If exceptions are taken, they must be listed in the handbook of instructions and identified by Section Number

Final Stage Ambulance Manufacturers ID Number_____
VIN_____
OEM Chassis Model, Year of Manufacturer_____
Vehicle Type_____

NOTICE: THIS VEHICLE, AS MANUFACTURED, CONFORMS TO THE PAYLOAD REQUIREMENTS OF THE FEDERAL AMBULANCE SPECIFICATION KKK-A-1822. USERS SHALL NOT LOAD VEHICLES ABOVE THE GVWR, GAWRS OR EXCEED THE TOTAL USABLE PAYLOAD OR CAPACITY LISTED BELOW.

TOTAL USABLE CARGO/EQUIPMENT CAPACITY _____lbs.
(Total remaining weight capacity of equipment and cargo evenly distributed in interior and exterior compartments the user may add.)

Figure 2 – Payload Calculation Form
The completed form shall be included in the handbook of instructions.

- The form shown here is suggested format.
- Deviations in dimensions are acceptable.
- All text must be included.
- No additional are permitted.

CUSTOMER USABLE PAYLOAD INFORMATION
Final Stage Ambulance Manufacturer's Name:_____
OEM Chassis Year, Make, Model:_____
OEM GAWR – Front:_____ lbs.
OEM GAWR – Rear:_____ lbs.
OEM GVWR:_____ lbs.
Minimum Payload Per KKK-A-1822:_____ lbs.
Curb Weight – AS BUILT – Front axle:_____ lbs.
Curb Weight – AS BUILT – Rear axle:_____ lbs.
Total Curb Weight – AS BUILT:_____ lbs.
Total Occupant Weight – 175 lbs. X number of designated seating positions:_____ lbs.
CUSTOMER USABLE Cargo/Equipment Capacity AS BUILT (From Ultamod):_____ lbs.

3.5.3 GROSS VEHICLE WEIGHT RATING (GVWR).
The combination of the vehicle's curb weight and payload weight shall not exceed the ambulance gross vehicle weight rating (GVWR). The final stage manufacturer's rating label shall show the GVWR and each gross axle weight rating (GAWR) of the vehicle.

3.5.4 WEIGHT DISTRIBUTION.
To provide for maximum safety, Participating Public Agencies and manufacturers shall locate vehicle-mounted components, equipment, and supplies to provide a vehicle that is laterally balanced and within the GVWR and each GAWR. The right and left wheel(s) of each axle of a completed ambulance shall be weighed to determine horizontal and lateral weight distribution. The weight distribution of a properly loaded ambulance on a level surface shall permit conformance to the FMVSS braking requirements in accordance with the statements provided by the chassis manufacturer. All specifications and requirements for weight distribution and center of gravity of the chassis manufacturer shall take precedence over the requirements contained in this section where the manufacturer's requirements are more restrictive.

- The weight between the right and left side of a given axle, when on a level surface, shall be within 5 percent when tested in accordance with AMD Standard 013.

- When loaded to the GVWR and within the GAWR for each axle, the front to rear weight distribution shall have not less than 20% of the total weight on the front axle, and not less than 50% nor more than 80% on the rear axle and shall be tested in accordance with AMD standard 013.

- The ambulance manufacturer shall locate the center of gravity (CG) of the ambulance/ambulance body to determine and assure the Participating Public Agency that the CG of the completed ambulance does not exceed any maximum horizontal and/or vertical limits set by the chassis manufacturer.

To meet the above weight distribution requirements, consideration shall be given by the Participating Public Agency and manufacturer to locate equipment and components to permit inherently proper lateral balance, front/rear axle loading, and center of gravity position.

3.5.5 RATINGS.
Vehicle and component ratings shall be the chassis manufacturer's published ratings and shall not be raised above the chassis manufacturer's rating.

3.5.6 CAB TO AXLE (CA), TYPE I AND III VEHICLES.
Cab to axle (CA) dimension of the vehicle chassis shall permit a minimum of 50 percent of the outside body length (including cab extensions) forward of the rear axle centerline, in addition to any cab to body clearance. Bodies designed with wheel openings shall have the rear wheels centered, with in +- 2" of those openings.

3.6 CHASSIS, POWER UNIT, AND COMPONENTS.

3.6.1 CHASSIS-FRAME.
The chassis shall include the chassis manufacturer's ambulance preparation package when available. The chassis-frame and components shall be constructed to withstand the strains of on-off road service and any special service and equipment requirements specified. All chassis (including cab) components shall be as represented in the chassis manufacturer's technical data.

3.6.2 VEHICLE LUBRICATION.
The chassis components, devices, accessories, and added equipment requiring lubrication shall be fully equipped with lubrication fittings, as provided by the chassis or equipment manufacturer.

3.6.3 POWER UNIT, ENGINES.

3.6.3.1 POWER UNIT.
The power unit shall meet or exceed the required vehicle performance specified at not more than the engine manufacturer's recommended operating engine speed. The OEM's diesel engine and power train shall be provided. When available from the OEM, an engine block heater shall be furnished.

3.6.3.2 ENGINE LOW TEMPERATURE STARTING.
The engine shall start satisfactorily without the aid of engine block preheating devices (except glow plugs) or combustion air preheater at 0° F. Verification test shall be performed per AMD 022.

3.6.4 POWER UNIT COMPONENTS.

3.6.4.1 OIL FILTER.
The oil filter shall be the chassis manufacturer's standard for the engine offered.

3.6.4.2 AIR FILTER.
The air filter shall be the chassis manufacturer's standard for the engine offered.

3.6.4.3 AIR POLLUTION CONTROL
The vehicle and engine shall conform to 40 CFR Subchapter C-Part 86 – "Control of Emissions from New and In-use Highway Vehicles and Engines," as evidenced by an EPA certificate of compliance. Vehicles shall also comply with all pollution control requirements for the state of final destination. Certificated of compliance shall be made available upon request.

3.6.4.4 FUEL SYSTEM
The fuel system shall conform to all applicable FMVSS, FMCSR, CARB, and EPA requirements. The OEM fuel system components shall be installed, connected, and routed in accordance with all chassis manufacturer's guidelines. The fuel capacity shall be sufficient to allow the vehicle to

be driven for at least 250 miles without refueling. This requirement shall be verified per the requirements of AMD 017. If additional fuel system components must be added to the chassis to meet the minimum fuel range specified in AMD 017, the modified fuel system and all added components must meet all applicable FMVSS, FMCSR, CARB and EPA requirements. A permanent label at the fuel filler opening shall be furnished specifying the type of fuel required.

3.6.4.5 COOLING SYSTEM
A coolant overflow recovery tank and compensating system shall be furnished. The cooling system shall be protected with an OEM solution of extended life antifreeze/coolant. Coolant to be the chassis manufacturer's recommended type and mixture. The contractor shall provide the OEM maximum size cooling system for the engine provided. The cooling system design shall maintain the engine at safe operating temperatures at all drivable altitudes and grades encountered during on and off road vehicle use and shall be tested in accordance with AMD Standard 014.

3.6.4.6 EXHAUST SYSTEM
The exhaust shall discharge at the vertical side(s) of the ambulance at a maximum distance of 1 in. beyond the side of the module and be angled /positioned to project the exhaust away from the door(s) to minimize fumes and contaminants entering the interior. On modular vehicles, the tailpipe outlet shall not terminate within 12 in. of the vertical axis of the fuel tank filler opening(s) when located on the same side. Modifications or extensions made to the OEM exhaust system shall meet or exceed chassis manufacturer's requirements in terms of backpressure, components, design, and workmanship.

3.6.5 DRIVE TRAIN

3.6.5.1 DRIVE TRAIN COMPONENTS
The drive train and component's torque capacity shall meet or exceed the maximum torque developed in the lowest gear ratio by the engine.

3.6.5.2 AUTOMATIC TRANSMISSION
The chassis manufacturer's automatic transmission shall be provided. The transmission shall provide not less than four speeds forward and one reverse and shall be equipped with the chassis manufacturer's heaviest duty oil cooler.

3.6.5.5 DRIVELINE
The driveline (driveshaft, U-joints, etc.) shall be balanced and supported to perform throughout the design speed range without whipping or vibrating.

3.6.5.7 BRAKE SYSTEMS, SERVICE AND PARKING
Chassis manufacturer's heaviest duty, power assisted brakes, linings, and parking brake shall be furnished on the chassis model offered. ABS brakes shall be furnished.

3.6.5.8 SPECIAL TRACTION (REAR END) DIFFERENTIAL
All ambulances shall have a positive traction, limited slip differential or automatic, locking type differential.

3.6.5.10 SUSPENSION
Vehicle shall be equipped with laterally matched sets (front and rear) of spring, torsion, or air suspension system components. Components shall have a rated capacity in excess of the load imposed on each member. Only corrections permitted by the chassis manufacturer to compensate for lean due to normal spring tolerance variations are permitted. Correction of lean due to imbalance is not permitted. Vehicle shall be balanced per AMD 013.

3.6.5.11 SPRING STOPS
The chassis manufacturer's standard spring bumpers and axle stops shall be furnished. The stops/bumpers shall prevent the wheel and axles from striking the engine, oil pan, fenders, and body under all conditions of operation.

3.6.5.9 SHOCK ABSORBERS
Shock absorbers, double-acting type, heaviest duty available from chassis manufacturer for model offered, shall be furnished on the front and rear axles.

3.6.6 STEERING
The OEM chassis manufacturer's standard, power assisted steering shall be furnished.

3.6.7 WHEELS
Types I, I AD, III & III AD ambulances shall be equipped with dual rear wheels and single front wheels. Type II ambulances shall be equipped with single, front and rear wheels. Wheels shall conform to the recommendations of the Tire and Rim Association, Inc., and shall be identical in type, size, and load rating for all wheels on the ambulance.

3.6.8 TIRES
Tires shall be as furnished by the chassis manufacturer and shall be OEM tubeless, steel belted radials.

3.6.9 RESERVED.

3.6.10 RESERVED

3.6.11 TIRE CHAINS AND CLEARANCE
Tire chain clearance on the furnished body shall be provided for all driving wheels per SAE J683. Sufficient chain clearance shall be provided to permit off road operation with the ambulance loaded to the maximum payload.

3.6.12 WHEEL TIRE BALANCING
Wheel/tire, hubs, and brake drum assemblies of the vehicle shall be dynamically balanced to a minimum of 70 mph.

3.6.13 RESERVED

3.6.14 HUBCAPS
When available from the chassis manufacturer (OEM) standard hubcaps or wheel covers shall be furnished on type II ambulances.

3.7 ELECTRICAL SYSTEM AND COMPONENTS

3.7.1 ELECTRICAL SYSTEM (REFERENCE FIGURE 3)
The ambulance electrical system shall be equipped with, but not limited to, the following:

1. Dual, OEM's batteries
2. Generating, starting, lighting, visual and audible warning systems.
3. Specified electronics equipment and devices (including master consoles located in the cab and patient compartment).
4. Other specified accessory wiring.
5. All electrical system components and wiring shall be readily accessible through access panels.
6. All switches, indicators, and controls shall be located and installed in a manner that facilitates easy removal and servicing.

7. All exterior housings of lamps, switches, electronic devices, connectors, and fixtures shall be corrosion resistant and weatherproofed.
8. Electrical fixtures attached to the exterior sides of the ambulance below the 75 in. level shall be near flush mounted and not protrude more than 2 in., except for such items as lights and ventilators.
9. All electrical devices and equipment installed, including the electromagnetic coils of high current solenoids, and relays etc, which produce RFI, shall include filters, suppressers, or shielding to prevent electromagnetic radiation and the resultant interference to radios and other electronic equipment.
10. Vehicles shall be immune from interference caused by radio transmissions.

3.7.1.1 WARNING INDICATORS

The electrical system shall incorporate a warning light panel located in the driver's compartment. It shall provide indicator lights for:

1. Any passenger or equipment external compartment door that is not closed
2. Cab entry doors that are not closed (when available from the OEM).
3. Extended devices (flood lights, etc)

The "Door/Equipment Open" indicator in the driver's compartment can be either an LED warning light with at least 0.2 square inches of lighted surface, an electronic text message visible in all ambient lighting conditions.

Electronic displays that are visible in all ambient light, that projects narrative information may be used in lieu of discrete, colored, indicator/ warning lights provided the projected message is at least as visible as the basic required warning light.

3.7.2 WIRING INSTALLATION

1. The ambulance body and accessory electrical equipment shall be served by circuit(s) separate and distinct from vehicle chassis circuits.
2. All wiring provided by the ambulance manufacturer shall be copper.
3. All wiring shall have type SXL or GXL high temperature cross-linked polyethylene, or better, insulation.
4. The use of multi conductor or ribbon cables are permitted provided they are not exposed to under hood or under vehicle temperatures/conditions.
5. The wiring shall be permanently color coded or marked the entire length of the wire.
6. Wiring shall be routed in conduit or high temperature looms with a rating of 300° F.
7. When cables are supplied by a component manufacturer to interconnect system components, these cables need not be continuously color coded/identified. They shall be coded/identified at the termination or interconnection points.
8. All added wiring shall be located in accessible, enclosed, protected locations and kept at least 6 in. away from exhaust system components.
9. Electrical wiring and components shall not terminate in the oxygen storage compartment except for the oxygen controlled solenoid, compartment light, and switch plunger or trigger device.
10. Wiring necessarily passing through an oxygen compartment shall be protected from damage.
11. All conduits, looms, and wiring shall be secured to the body or frame with insulated metal cable straps.
12. All apertures on the vehicle shall be properly grommeted for passing wiring.
13. All items used for protecting or securing the wiring shall be appropriate for the specific application and be standard automotive, aircraft, marine, or electronic hardware.
14. Cable ties shall not be used to support harnesses, but may be used for bundling purposes.

15. Electrical panels that are accessible to accidental contact shall have a protective cover, shield, etc. to prevent shorts that can result in injury, fire, or damage to the electrical system.
16. Wiring shall not be secured to brake lines or fuel lines.

3.7.2.1 WIRING CRITERIA

1. All wiring (including grounds), devices, switches, outlets, etc., except circuit breakers, shall be rated to carry at least 125 percent of the maximum ampere load.
2. A service loop of wire or harness shall be provided at all electrical components, terminals, and connection points.
3. All splices and terminals provided shall comply with SAE J163, J561, or J928 as applicable.
4. All wiring between the cab/chassis and module in Type I and III ambulances shall be connected to a terminal strip(s), block(s), or multi-pin connector(s) near the point of entry to the patient module.
5. All terminals shall be permanently numbered or coded.
6. Terminal strip(s) block(s), or multi-pin connector(s) shall be readily accessible for checking and service.
7. All exterior wiring to lights or any other component shall utilize sealed connectors or splices.
8. The ambulance electrical system shall incorporate a master circuit breaker panel with circuit breakers or other electronic, non-disposable, current protection devices, in each circuit, which comply with SAE J553 Type I, or Type III (if circuit breaker is readily accessible for resetting by the driver or EMSP).
9. When multiconductor cables/ribbon cables are used for low current (self limiting) circuits, additional fuses/circuit breakers are not required.
10. One extra 15-ampere circuit breaker shall be provided for future use.
11. For high current circuits, where SAE Type I breakers are not commercially produced, protection for these circuits may be provided with other types of circuit breakers.
12. All circuit breakers shall be securely mounted, easily removable, and readily accessible for inspection and service.
13. All electrical and electronic components, switches, connectors, circuit breakers, lamps, and indicators, including the vehicle batteries, shall be marked with an easily read identification code number and/or letter.

3.7.2.2 PRINTED CIRCUITS

When printed circuits are utilized, they shall conform to IPC A-610D standards, "Acceptability of Electronic Assemblies." Printed circuit assemblies provided must qualify under Classification 1.4.1 as class 3 for Life Support or other Critical Assemblies." Printed circuit board connections and components shall conform to all other specification requirements.

3.7.3 GROUNDING

Dedicated grounds for all appliances, circuits, etc. shall be furnished. The use of appliance mounting screws/hardware shall not be used for grounding purposes unless specifically designed for such use by the appliance manufacturer.

3.7.3.1 RF GROUNDING

To provide RF grounding and minimize potential interference with chassis manufacturer's computers, the module and chassis cab shall be connected to the chassis frame with a separate dedicated minimum 3/4", braided ground strap with soldered ends that are secured to cleaned metal surfaces on the body and frame with lock washers. To prevent corrosion, both ends of the attached ground strap shall then be sealed with either rust proofing compounds or non-hardening battery terminal sealer. Regular stranded copper wire, while providing a DC ground, does not provide RF grounding and does not meet this requirement

3.7.4 WINDSHIELD WIPERS AND WASHERS
Vehicle shall be equipped with dual, electric, multi-speed, and OEM intermittent windshield wipers.

3.7.5 HORNS
The chassis manufacturer's dual electric horns shall be furnished.

3.7.6 LOW VOLTAGE ELECTRICAL SYSTEM
The generating system shall be rated at 14 volts; at a minimum operating temperature of 200°F.

The ambulance shall, when available from the OEM, be equipped with standard or optional generating system designed for ambulance applications.

The generating system shall be capable of supplying continuous electrical load, which consists of the following electrical equipment and systems:

1. Engine/transmission control system
2. Headlights (low beam)
3. All FMVSS 108 lights
4. Windshield wipers (low speed)
5. Cab air conditioning (at coldest setting with highest blower speed)
6. Radio in receiving mode (or equal load, if not equipped)
7. Patient module dome lighting (in the high intensity setting)
8. Patient module air conditioning (at coldest setting with highest blower speed)
9. Emergency warning lighting system (in the daytime "primary" mode)
10. 20 amp medical load or equal.

The throttle control device shall control the engine RPM necessary to maintain the heating and air conditioning systems, at full operating capacity, and to maintain the generating system's required output when the vehicle is stationary and the parking brake is set.

The 12-volt electrical system shall incorporate a voltmeter and low voltage warning device which is functionally connected as shown in Figure 3. The FSAM shall test each ambulance prior to delivery and provide, to the Participating Public Agency, a written certification indicating the amount of generating capacity remaining, at the regulated voltage after supplying the total electrical load as manufactured (including the all options purchased).

3.7.6.1 ENGINE HIGH-IDLE SPEED CONTROL, AUTOMATIC
An engine high-idle speed control shall be furnished on all vehicles, which automatically increases the engine speed (RPM) to the engine manufacturer's recommended setting to sustain the ambulance's total continuous electrical load at the regulated voltage, and provide maximum heating/air conditioning output. The device shall be preset so that, when activated, it will operate the engine at the appropriate RPM. The device shall operate only when switched to the "ON" position and the transmission is in "NEUTRAL", "PARK" and the parking brake is applied (when required by the chassis manufacturer). For transmissions without a "PARK" position, the device shall only function with the transmission in "NEUTRAL" and with the parking brake applied. The device shall disengage when the operator depresses the service brake pedal or the transmission is placed in gear, and automatically re-engages when the service brake is released or when the transmission is placed in neutral or park. The chassis manufacturer when available shall furnish the device.

3.7.6.3 VOLTMETER and VOLTAGE MONITOR
A voltmeter illuminated for nighttime operation shall be furnished. The electrical system shall be monitored by a system that provides an audible and visual warning in case of the low voltage to

persons in the ambulance of an impending electrical system failure caused by the excessive discharge of the batteries. The charge status of the battery shall be determined by direct measurement of the battery voltage. The alarm shall sound if the system voltage at the battery drops below 11.8 V for 12 V nominal systems for more than 120 seconds.

3.7.7 BATTERY SYSTEM.
Two batteries (or additional batteries as required by the chassis manufacturer) for ambulance use shall be furnished. The batteries shall be equivalent to the chassis OEM batteries. Batteries shall be located in a ventilated area, sealed off from occupant compartments, and shall be readily accessible for servicing and removal. When batteries are mounted in the engine compartment, they shall be provided with a heat shield as a safeguard against high under hood temperatures when relocating batteries; the chassis manufacturer shall approve the method of relocation.

3.7.7.1 A 12 volt DC automatic charger/conditioner shall be provided.

1. The charger/conditioner shall be connected to the 12 volt DC battery system as shown in Figure 3.

2. The charger/conditioner shall be capable of supplying a minimum of 10 amperes charging current.

3. The charger/conditioner shall be permanently mounted, in the vehicle, in a properly ventilated, accessible location and wired to the 125 volt AC utility power and Figure 4.

4. The battery conditioner shall monitor the battery state of charge and, as necessary, automatically charge or maintain the batteries without gassing, depleting fluid level, overheating, or overcharging.

5. A permanently mounted decal or engraved plate shall be furnished in a conspicuous location in the cab stating:

"This vehicle is equipped with a battery conditioner to maintain batteries in a full state of charge, and a dedicated 12 volt recharging circuit for portable battery powered equipment. For operation, vehicle shall be plugged into 125 volt AC shore power during periods of non-use".

3.7.7.2 PORTABLE EQUIPMENT CHARGING CIRCUIT
A circuit shall be furnished (Figure 5) for charging all portable battery powered devices, i.e. suction units, hand lights, defibrillators, portable radios, etc. This circuit shall prevent discharge of chassis batteries by only permitting the charging of portable devices when the vehicle is either running or the Automatic Charger/Conditioner is connected to shore power. Circuit breaker protection shall be provided and shall have a minimum of 10 amp capacity. An additional tagged, identified lead shall be furnished in both the cab and module for connection of additional (future) portable equipment that requires recharging.

3.7.7.3 INTERNAL 12 VOLT DC POWER (REFERENCE FIGURE 3)
Two automotive “Power Point” type connectors shall be furnished, in the patient compartment. Each connector shall be rated for 12 volt DC, 20 ampere capacity, and be on a separately protected circuit. This circuit shall also include a (low voltage drop) “Schottky” diode to isolate medical equipment batteries from any electrical loads that the remainder of the ambulance electrical system may impose. The “Schottky” diode shall be heat-sink mounted, have an inverse voltage rating of at least 45 volts and also be rated to carry the maximum short circuit current,

until the circuit breaker opens. The diode shall be physically located in an accessible location and be electrically connected between the circuit breaker and the "action wall" mounted connectors.

3.7.7.4 MASTER MODULE DISCONNECT SWITCH OR DEVICE
An illuminated "Module Disconnect" switch shall control all electrical loads added by the ambulance manufacturer, or an illuminated switch controlled solenoid as shown in Figure 3.This switch (see Figure 3) shall be located in the driver's compartment, be legibly marked, illuminated when "ON", and rated to carry at least 125 percent of the circuit's maximum current. The module disconnect switch or device shall be different in feel from other switches, or be physically isolated from them.

3.7.8 125 VOLT AC UTILITY POWER (REFERENCE FIGURE 4)

The ambulance shall be furnished with a 2-wire plus ground 125 volt AC wiring system that is separate and distinct from the vehicle's DC wiring system(s). The AC electrical system, including wiring and associated equipment, shall comply with AMD Standard 009. Listing shall be by a nationally recognized testing laboratory, recognized by OSHA under Appendix A to 29 CFR 1910.7. The AC system is to be utilized while the vehicle is stationary for powering maintenance devices, medical equipment and battery chargers. The AC system shall not be utilized for operational ambulance interior lighting, such as dome and cot lights.

3.7.8.1 UTILITY POWER CONNECTOR
A 125-volt AC flanged inlet conforming to NEMA 5-15, with spring loaded cover assembly suitable for wet locations, shall be installed on the driver's side of the ambulance body in close proximity to driver's door. The connection shall be permanently labeled with the following:

THIS CONNECTION IS FOR 125-VOLT AC, 60 Hz, 15-AMPERE SUPPLY

This receptacle shall energize the vehicle's internal AC circuit from an external power source (utility power). The Participating Public Agency's stationary utility power circuit supplying the ambulance's 125-volt AC power should incorporate ground fault protection. A proper mating, weatherproof, 15 ampere connector body conforming to NEMA 5-15 shall also be furnished without cable and tagged specifying the size, type of wire necessary, and the polarity of the future hookup.

3.7.8.2 ELECTRICAL 125 VOLT AC RECEPTACLES
The patient compartment shall be furnished with two (2) 125-volt AC duplex receptacles conforming to NEMA 5-15. Receptacles shall be near flush, vertically mounted. All interior outlets shall be installed in accordance with Section210-7 (Receptacles and Cord Conductors) of the NEC. One outlet shall be located on the primary patient action wall and the other shall be located in the right front cabinet/storage area. Both outlets shall be at least 12 in from any oxygen outlet. An indicator shall be located within each 125 volt AC receptacle as a line monitor indicating a live (hot) circuit. The receptacles shall be labeled with the following: "125-VOLT AC."

3.7.8.3 125-VOLT AC NOMINAL SYSTEMS
1) The electrical equipment and material indicated for connection to a wiring system rated 125 volts, nominal, 2-wire with ground shall incorporate a minimum 15 ampere circuit breaker which can be used as a master AC disconnect switch
2) The AC wiring shall utilize stranded wire, Type SO or Type SEO cord with a WA suffix, rated at 600V and 194ºF., covered with a minimum 300° F flame retardant wire loom, or approved wire in conduit
3) All products shall be used only in the manner for which they were tested and found suitable.
4) Other sources of AC power shall be wired in full conformity with the requirements of this standard.

5) Grounding shall be in accordance with section 250-6 [Portable and Vehicle Mounted Generators] of the National Electrical Code (NEC).
6) All 125-volt AC receptacle outlets of the ambulance shall have ground fault circuit interrupter protection.
7) Where rigid metal conduit or intermediate metal conduit is terminated at an enclosure with a lock nut and bushing connection; two lock nuts shall be provided, one inside and one outside of the enclosure. All cut ends of conduit shall be reamed or otherwise finished to remove rough edges.
8) Boxes are required for all inlets and/or outlets.
9) Non-metallic boxes shall be acceptable only with non-metallic conduit.
10) Boxes shall be mounted in accordance with Article 370 [OUTLET, DEVICE, PULL AND JUNCTION BOXES, CONDUIT BODIES AND FITTINGS] of the NEC.
11) No bend shall have a radius of less than five times the cable or conduit diameter, whichever is greater.
12) Tubing, conduit and loom shall be supported with clamps at the outlet boxes, distribution panel boards and splice boxes on appliances. Supports shall be provided every 24".
13) Where subject to physical damage, exposed type SO cable will be protected by guard strips, raceways or other means.
14) The branch circuit over current devices shall be rated:
    i) Not more than the circuit conductors and
    ii) Not more than 150% of the rating of a single appliance rated 13.3 amperes or more and supplied by an individual branch circuit, or according to the appliance manufacturer, but
    iii) Not more than the over current protection size marked on motor-operated appliances

3.7.8.4 DISTRIBUTION BOX

1) The distribution box shall be of the dead-front type and shall be installed in a readily accessible location.
2) The distribution panel board shall have a grounding bus with sufficient terminals for all chassis grounding and separate neutral grounding conductors or other approved grounding means.
3) The grounded circuit conductor (neutral) shall be insulated from the equipment grounding conductors and from equipment enclosures and other grounded parts. The grounded (neutral) circuit terminals in the distribution panel board and in appliances shall be insulated from the equipment enclosure.

3.7.8.5 INTERIOR EQUIPMENT GROUNDING

1) In the electrical system, all exposed metal parts, enclosures, frames, fixtures, canopies, etc., shall be effectively bonded to the grounding terminals or enclosure of the distribution panel board.
2) Only bare wires, green colored or green wires with yellow stripes shall be used for equipment grounding conductors.
3) Grounding of electrical equipment shall be provided as follows:
    a) Connection of metal raceway, i.e., conduit or electrical metallic tubing.
    b) A connection between the one or more equipment grounding conductor and a metal box by means of a grounding screw (which shall be used for no other purpose) or a listed grounding device.
    c) The equipment grounding conductor shall be permitted to be secured under a screw threaded into the fixture canopy other than a mounting screw or cover screw or attached to a listed grounding means (plate) in a non-metallic outlet box for fixture mounting (grounding means shall also be permitted for fixture attachment screws).
    d) A connection between the one or more equipment grounding conductors brought into a non-metallic outlet box shall be so arranged that a connection can be made to any fitting or device in that box which requires grounding.

e) Where more than one equipment grounding conductor or branch circuit enters a box, all such conductors shall be in good electrical contact with each other and the arrangement shall be such that the disconnection or removal of a receptacle, fixture, or other device fed from the box will not interfere with or interrupt the grounding continuity.
f) Cord-connected appliances shall be grounded by means of an approved cord with equipment grounding conductor and grounding attachment plug.

3.7.8.6 BONDING OF NON-CURRENT-CARRYING METAL PARTS

1) All exposed non-current carrying metal parts that may become energized shall be effectively bonded to the grounding terminal or enclosure of the distribution panel board.
2) A bonding conductor shall be connected between the distribution panel board and an accessible terminal on the chassis. Aluminum or coppered aluminum conductors SHALL NOT be used. Any ambulance that employs a unitized metal chassis-frame construction to which the distribution panel is securely fastened with a bolt and nut shall be considered to be bonded.
3) Grounding terminals may be of the solderless type and listed as pressure terminal connectors recognized for the wire size used. The bonding conductor shall be copper strand and equal in amperage capacity to the main supply cables.
4) The ambulance body and exterior covering shall be considered bonded where:
   a) The metal panels overlap one another and are securely attached to the metal frame parts by metal fasteners or welding and
   b) The lower panel of the metal exterior covering is secured by metal fasteners at each cross member of the chassis, or the lower panel is bonded to the chassis by a metal strap.
   c) Metal circulating air ducts shall be bonded.
   d) The compressed gas pipes shall be considered bonded if they are bonded to the chassis.

3.7.8.7 APPLIANCE ACCESSIBILITY AND FASTENING

All electrical appliances shall be accessible for inspection, service, repair, and replacement without removal of permanent construction. Appliances shall be fastened in accordance with the manufacturer's directions.

3.7.9 DRIVER COMPARTMENT CONTROLS

In addition to the left-hand drive controls and switches, the final stage ambulance manufacturer shall provide and locate, within easy normal reach of the driver, the specified controls, and instruments.

3.7.10 PATIENT COMPARTMENT CONTROLS

The patient compartment controls, switches, and instruments shall be panel mounted and located within normal reach of the seated EMSP.

3.7.11 MARKING OF SWITCHES, INDICATORS, AND CONTROL DEVICES

All switches, indicators, and control devices supplied by the end product manufacturer of the ambulance shall be clearly visible to the ambulance personnel. They shall be perceptively and permanently identified with at least 12 point letters for the noun or function, and 8 point letters for the remainder of the legend. The identifications shall be contrasting colors etched or engraved in plastic or metal, or printed and laminated in see through plastic, and grouped according to function, and mounted in illuminated or backlit panel(s) or the console.

3.7.12 ELECTROMAGNETIC RADIATION AND SUPPRESSION

In addition to OEM chassis, all added electrically operated or electrical generating devices, including alternators, air conditioning, warning light systems, electromagnetic coils of high current solenoids and relays, and medical equipment, shall be electromagnetic radiation suppressed,

filtered, or shielded to prevent interference to radios and telemetry equipment aboard the vehicle and the surrounding area and shall not exceed Mil-Std 461 limits per Ground, Navy in table V of the requirement matrix. Type certification for these devices is acceptable.

3.8 LIGHTING, EXTERIOR AND INTERIOR

3.8.1 AMBULANCE EXTERIOR LIGHTING

The basic exterior ambulance lighting shall include daytime running lights when available from the chassis manufacturer, amber colored front and rear directional signals and hazard warning lights (except on Type II ambulances, if amber lenses are not available from OEM). The lower front and rear side marker lights shall flash in conjunction with the directional signals. Backup lights/loading light(s), clearance lamps (when applicable), ambulance emergency lights, floodlights, and spotlight(s), shall be furnished as specified. The ambulance manufacturer shall furnish light assemblies that are manufactured with weather resistant materials that are installed in a manner that will not cause electrolysis of light housings or vehicle body.

3.8.2 AMBULANCE EMERGENCY LIGHTING.

A strobe, halogen, HID, LED, or any other source of light for the emergency lighting system shall provide the ambulance with 360 degrees of conspicuity for safety during its missions. The system shall display highly perceptible and attention getting signals that function in a modal system, and convey the message in the “PRIMARY MODE” - “Clear the Right-of-Way” and in the “SECONDARY MODE” - “Hazard, Vehicle Stopped on Right-of-Way.” The ambulance standard warning light system shall not impose a continuous average electrical load exceeding 40 amperes at 14.2 volts.

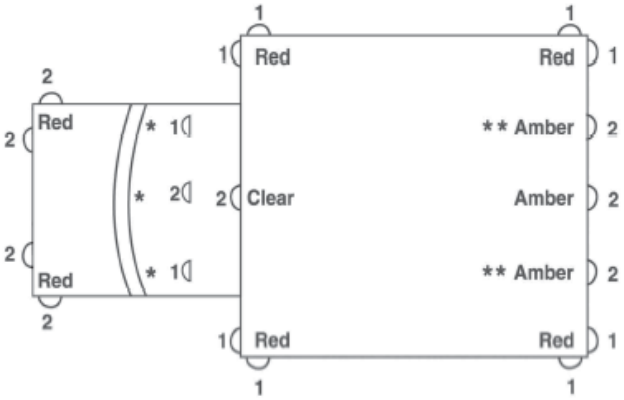
Warning light systems shall not impair the effectiveness of the ambulance’s exterior lighting with conformity to the requirements of FMVSS No. 108.

3.8.2.1 EMERGENCY LIGHTING SYSTEM CONFIGURATION

The ambulance standard emergency warning light system shall contain twelve fixed red lights, one fixed clear light and one fixed amber light. These lights shall function in a dual mode system as shown in Table I below and meet the physical and photometric requirements. The upper body warning lights shall be mounted at the extreme upper corner areas of the ambulance body The single clear light shall be centered between the two front facing, red, upper corner lights or in a dedicated housing mounted forward of the body on the cab roof. If due to limited body dimensions and physical size of the outboard forward facing lights, the lights may also be mounted in dedicated housings on the cab roof. Doors or other ancillary equipment shall not obstruct the standard warning lights. The amber light shall be symmetrically located between the two rear facing red lights. The red “grille” lights shall be located at least 30 in. above the ground and below the bottom edge of the windshield and be laterally separated by at least 18 in., measured from centerline to centerline of each lamp. The lateral facing intersection lights shall be mounted as close as possible to the front upper edge of each front fender and may be angled forward a maximum of 30 degrees. All warning lights furnished shall be mounted to project their highest intensity beams on the horizontal plane.

Alternate approved lighting systems are NFPA 1901 compliant or SAE J2498 compliant.

TABLE 1



FLASH PATTERN

* Optional forward facing light locations on cab roof for two red and single center clear lights.

** Optional rear amber lights in lieu of single center light.

1 - Indicates lights flashing at the same time.
2 - Indicates lights flashing 180 degrees out of phase with 1.

MINIMUM FLASH ENERGY, Cd-S PER FLASH, PER FIXTURE				
COLOR	RED		CLEAR	AMBER
LOCATION	GRILL & FENDERS	UPPER BODY CORNERS	FRONT CENTER	REAR CENTER*
DAY	160 Cd-S @ HV	240 Cd-S @ HV	900 Cd-S @ HV	600 Cd-S @ HV
	80 Cd-S @ $\pm 5^0$ H Points	120 Cd-S @ $\pm 5^0$ H Points	450 Cd-S @ $\pm 5^0$ H Points	300 Cd-S @ $\pm 5^0$ H Points
	12 Cd-S @ All 5^0 V - 45^0 H Points	32 Cd-S @ All 5^0 V - 45^0 H Points	96 Cd-S @ All 5^0 V - 45^0 H Points	72 Cd-S @ All 5^0 V - 45^0 H Points
NIGHT	10 - 30% of the above			

* Single center rear or combined dual rear (Optional)

MODAL EMERGENCY LIGHTING SYSTEM				
COLOR & LOCATION / MODE OF OPERATION	RED	CLEAR	AMBER	RED
	Front and Rear Corners	Front Upper Center	Rear Center	Grille and Fender
PRIMARY "Clear the Right-of-Way"	ON	ON	ON	ON
SECONDARY "Hazard-Vehicle Stopped on Right-of-Way""	ON	OFF	ON	OFF

3.8.2.2 PHOTOMETRIC, CHROMATICITY, AND PHYSICAL REQUIREMENTS
Each emergency light shall flash 75 to 125 times per minute. The chromaticity values of the lights shall conform to SAE J578, for their respective color, except for the red lights, which may conform to the following expanded boundary limits of: y =0.34; y = 0.32; x = 0.62. All warning lights shall project a beam spread of at least 5 degrees up and 5 degrees down and at least 45 degrees left and right of H-V. Each light shall produce flash energy, (Cd-s) per flash, measured from the H-V to all the extreme test point coordinates and shall be tested at all 5 degree increments. At no point shall the Cd-s values drop to less than the minimum values as shown in the table above when tested at 14.2 volts. Flash energy shall be determined in accordance with the SAE J845 method for determining the flash energy of a light. Testing shall be conducted on the device(s) as manufactured including use of the actual light source and all other related system components.

3.8.2.3 SWITCHING ARRANGEMENTS
The emergency light switches shall be wired and arranged to provide the warning light signal modes and combinations as specified. All emergency light switches shall be labeled and each Primary/Secondary mode switch shall have indicator light to show the driver which mode is activated.

3.8.2.4 HARDWARE CONSTRUCTION AND INSTALLATION
The emergency lighting system shall be comprised of components and devices that comply with the general requirements and tests of SAE J575g, J576d, J578, and J551, as applicable for the unit. Warning lights shall be firmly fastened to reinforced body surfaces in accordance with the lighting manufacturer's requirements and recommendations and include aiming wedges to compensate for sloped body surfaces, grill, hood and fender angles or mold release angles on roof caps. The ambulance manufacturer shall aim the lights to assure that all lighting performance requirements herein are met. The lights shall be aimed either mechanically or optically on the horizontal axis with a tolerance of +0 degrees to -3 degrees. All switches, connectors, and wiring shall be rated to carry a minimum of 125 percent of their maximum ampere load. When halogen or other long duty cycle light source is used, the duty cycle of any device shall not exceed 50 percent. When strobe lights are furnished, all high voltage leads and connections shall be insulated and enclosed, or weatherproof connectors, with the proper voltage rating shall be used.

3.8.2.5 TESTS, WARNING LIGHT SYSTEM
The lighting manufacturers shall furnish and certify or the ambulance manufacturer shall measure and record the total average current load of the standard emergency warning light system on the vehicle as manufactured at the regulated voltage of 14.2 Volts, when operated in the mode which draws maximum current. This load current test shall be conducted per AMD Std. 005. The warning light system and related components and devices shall be tested and approved by an Automotive Manufacturers Equipment Compliance Agency (AMECA) accredited laboratory independent from the lighting device manufacturer's own labs and listed with the AMECA for compliance with the requirements in this specification.

3.8.3 FLOOD AND LOADING LIGHT (EXTERIOR)
Flood and loading lights shall be not less than 75 in. above the ground and unobstructed by open doors. Floodlights shall be located on the sides, and a patient loading light shall be located on the rear of the ambulance. They shall be firmly fastened to reinforced body surface. Floodlight switches shall be located on the cab console and control each side independently. Loading light(s) shall automatically be activated when rear doors are opened.

3.8.5 AMBULANCE INTERIOR LIGHTING
The basic interior ambulance lighting configuration shall be designed to minimize electrical loads and include: A driver's compartment dome light; instrument panel lights; master switch panel; and console light(s). Lighting shall be designed and located so that no glare is reflected into the driver's eyes or his line of vision, from switch control panels or other areas that are illuminated while the vehicle is in motion. The EMSP's control panel shall be separately illuminated. All lights shall have lampshells and housings grounded.

3.8.5.1 PATIENT COMPARTMENT ILLUMINATION
Normal white illumination (dome and EMSP's switch panel lighting) in the patient compartment shall meet AMD Standard 016. Blue light(s) or lenses shall not be used. Patient compartment lights shall not be powered by the vehicle's AC system if so equipped. The patient compartment dome lighting (in the dim setting) and exterior corresponding loading lamp(s) shall be automatically activated when the side entry or rear entry patient compartment doors are opened and shall meet AMD Standard 016. All interior dome lighting, including "checkout" lights, shall be near flush mounted and not protrude more than 1.5 in. Dome lighting shall not consume more than 25 amps in the bright setting and shall have two separately protected and controlled circuits. Switches, electronic controls, or fireproofed rheostats may be used to control lighting.

3.9 CAB-BODY DRIVER COMPARTMENT AND EQUIPMENT

3.9.1 DRIVER'S COMPARTMENT, CAB-BODY STRUCTURE
All cab compartments shall be of sufficient size to accommodate a driver and passenger, with space to perform driving and control activities. The cab shall be organized and designed with the specified and required equipment and accessories for ease of operation and safety. There shall be a console convenient to driver in the drivers cab. The console shall contain all added switches for operation of said ambulance.

3.9.2 CAB-BODY PROVISIONS.
An OEM commercial two door cab shall be furnished that is suitable for the subsequent mounting of various ambulance equipment and bodies.

3.9.3 CAB COMPARTMENT DRIVER AND PASSENGER SEAT
The driver's compartment shall be OEM two individual bucket-type seats (driver and passenger). Driver's seat shall have the OEM's full, unobstructed seat track travel range of longitudinal adjustment, and a minimum of 30 percent of the range of inclination, but not less than the angle furnished on the OEM's standard non-reclining high back seat.

3.9.4 CONTROLS AND OPERATING MECHANISM
All controls and operating mechanisms shall be located for left-hand drive. Lever controls, equipment, items, and devices shall be installed, located, and stowed for the convenience of the purpose intended and shall not interfere with the ambulance personnel or patient's ingress or egress of respective compartments.

3.9.5 OUTSIDE REARVIEW MIRRORS
Dual rearview OEM mirrors having a combination flat/convex mirror system, shall be furnished. The mirrors shall be the largest available from the OEM. Unless the mirror assembly is manufactured as an integral assembly, all four mirror head faces shall be independently adjustable. Hardware and mirror heads shall have a corrosion resistant exterior finish.

3.9.6 BUMPERS AND STEPS
OEM's standard chrome bumper shall be furnished in the front of the chassis. The rear of the ambulance shall be furnished with a sturdy, full-width, rear bumper, with step secured to the vehicle's chassis- frame. The bumper-step shall be designed to prevent the accumulation of

mud, ice, or snow and made of anti-skid open grating metal. These steps shall not be located or exposed to the interior of the ambulance when the door(s) are closed. All necessary steps shall be at least the width of the door opening for which they are provided. The step's tread shall have a minimum depth of 5" and a maximum depth of 10". If the step protrudes more than 7" from the rear of the vehicle, a fold up step shall be furnished. The rear bumper and step shall be adequate to support a test weight of 500 lbs. The height of the rear step shall not exceed 22".

3.9.7 BODY PROTECTION

3.9.7.1 FENDERS
Fenders and wheel housings shall be provided to cover all tires.

3.9.7.3 MUD FLAPS
Mud flaps, at least as wide as the tire(s), shall be provided behind the front and rear wheels and shall be reinforced at the point of attachment to the vehicle. Mud flaps may be incorporated into the running boards.

3.9.7.6 FUEL FILL SPLASH PLATES
The painted surface of the ambulance body shall be protected from discoloration due to spilled fuel during refueling. Protection shall be provided by a drain in the fuel fill housing(s) or by splash plate(s) under the fuel fill opening.

3.9.8 ENGINE HOOD
Engine hood and cowl shall be fitted to prevent precipitation, heat, odors, and noise from entering the interior of the cab and body. Cab compartment engine covers, on Types II and III ambulances, shall be removable for easy access to engine and components.

3.9.9 CAB CONNECTING BELLOWS FOR TYPE I VEHICLE
A flexible, weather-tight bellows, fabricated from EPDM, Hypalon, sheet or molded rubber, or other durable materials that meet the temperature requirements herein and resist ozone, sunlight, oil, fungus, and will not crack, rot or deteriorate, shall be provided between the Type I cab and the modular body. Bellows shall be designed for proper fit and finish and be able to absorb lateral, vertical, and torsional displacement due to body/cab movement. Window in the cab or body shall be of the sliding type, shall be aligned, and connect with the modular body window opening and shall conform to requirements of the partition.

3.10 AMBULANCE BODY AND PATIENT AREA

3.10.1 BODY ACCOMMODATIONS
The ambulance body and patient compartment shall be sufficient in size to transport occupants and all specified stretchers, cots, and litters. There shall be space around the patients to permit a medical services provider to administer life support treatment to at least one patient during transit.

3.10.2 CAB/PATIENT COMPARTMENT ACCESS WINDOW
The ambulance and body bulkheads shall have an aligned window opening of at least 150 square in., for visual checking and voice communications between the cab and the patient's compartment for non-walk through vehicles. The window shall be latchable from the cab side and shall be an adjustable, transparent, shatterproof panel.

3.10.3 EMERGENCY MEDICAL SERVICES PROVIDER (EMSP) SEATING
The EMSP shall be provided with a seat conforming to all applicable FMVSS Standards, and be equipped with a safety belt and a padded back and a padded headrest. The seat shall be not less than 15 in. deep by 18 in. wide and a minimum distance of 43" from the top of the padded seat to any overhead obstruction. The EMSP seat shall be located to allow for the care of the patient.

The space under the seat may be designed as a storage compartment or utilized for other equipment. Headroom clearance to be evaluated according to AMD Standard 026.

3.10.4 PATIENT COMPARTMENT INTERIOR DIMENSIONAL PARAMETERS

The patient compartment shall provide a minimum of 325 cubic feet of space (275 cubic feet of space for Type II), less volume for cabinets, while complying with the following:

a. The compartment configuration shall provide at least 25 in. of unobstructed space at the head of the primary patient, measured from the face of the backrest of the EMSP seat to the nearest edge of the cot. A minimum of 10 in. shall be provided from the rear edge of the cot mattress to the rear loading doors, to permit clearance for traction or long board splints.
b. The compartment shall provide a minimum of 12 in. of clear aisle walkway between the edge of the primary patient cot and base of the nearest vertical feature measured along the floor. Each end of the walkway shall provide access to a means of egress.
c. The patient compartment shall provide at least 60 in. height, over the primary patient area, measured from floor to ceiling panels.

3.10.5 BODY, GENERAL CONSTRUCTION

For modular construction, the body shall be all welded aluminum or, other lightweight, inherently corrosion resistant materials of equal, or greater, strength. The exterior of the body shall be finished smooth with symmetrically radius corners and edges, and shall include doors and windows specified herein. Ambulance body, as a unit, shall be designed and built to provide impact and patient compartment penetration resistance and shall be of sufficient strength to support the entire weight of the fully loaded vehicle on its top or side, if overturned, without separation of joints or permanently deforming roof bow or reinforcements, body posts, doors, stringers, floor, inner linings, outer panels, rub-rails, and other reinforcements. Wood, or wood products, shall not be used for structural framing.

The roof structure, liner, and outer skin or cap shall be designed and constructed to prevent separation. Any absorbent material such as carpeting, fabric, or inside/outside plastic type carpeting, etc., that resists cleaning and decontamination shall not be used.

3.10.6 AMBULANCE BODY STRUCTURE

All parts of the ambulance body and attachments shall be fastened with rust-resistant fasteners in a manner that will preclude loosening. Cabinets, benches, partitions, oxygen cylinder holders, guide rails, and cot holders shall be attached to metal tapping plates and/or framing welded to the body structure. These components shall be fastened by welding, bolting, or self-tapping (threading) machine screws, on a minimum of 18 in. centers. Sheet metal, self-tapping wood/metal screws, nails, staples, etc. shall not be used in assembling the ambulance structure, except for self-threading sheet metal screws used for light trim panels and for retention of wood or composite sub-flooring. Ambulance bodies with an extended roof shall have the roof structural members permanently fastened to structural members of the body. Drip rail(s) shall be provided around the entire modular body and have drain points at each corner. Drip rails shall also be furnished over each entry and compartment door. The body, roof, and panel joints shall be watertight. All openings between the chassis-body and occupant carrying compartments shall be sealed to prevent intrusion of water, dust, and exhaust gases.

3.10.7 BODY MOUNTING

On modular ambulance bodies, to reduce stress on body and frame, minimize height above the frame, and isolate the patient compartment from noise and vibration, full floating, automotive style, rubber body mounts shall be furnished. A minimum four body mounts per frame rail not to exceed the mechanical properties of the body mounts and fasteners shall be furnished. Fasteners shall be a minimum of Grade 8.

3.10.8 DOORS
Two patient compartment door openings shall be provided. They shall not be on the same side of the vehicle.

Bottom steps at the entry/exit of doorways of the patient compartment shall be at least the width of the doorway internal frame opening.

3.10.8.3 DOOR 1
There shall be a door opening for loading a patient on a backboard.

a. For modular bodies the door(s) shall provide a minimum clear opening of 30 in. wide and of 46 in. high.
b. For Type II vehicles the OEM's standard door opening shall be furnished.

3.10.8.3 DOOR 2
There shall be a door opening for loading a patient on a cot.

a. For modular bodies the door(s) shall provide a minimum clear opening of 44 in. wide and of 46 in. high.
b. For Type II vehicles the OEM's standard door opening shall be furnished.

3.10.8.3 PROTECTION OF PATIENTS AND CREW.
Upholstered padding/cushions shall be provided at the upper interior areas of the doorframes. Similar padding/cushions shall also be furnished at other areas that may be capable of causing injury.

3.10.9 DOOR LATCHES, HINGES, AND HARDWARE.
1) Door latches, hinges, and hardware furnished by chassis and ambulance manufacturers shall comply with FMVSS 206.
2) When doors are open, the hinges, latches, and door-checks shall not protrude into the access area.
3) All doors shall have hardware or devices to prevent inadvertent closing.
4) To facilitate entry and exit from the vehicle, a minimum 6 in., tubular or semi-oval, minimum 3/4" wide (diameter), grab handle shall be provided on the inside of each door or the adjacent body structure (in addition to a door operating handle).
5) Door shall be equipped hold opens or stops, to prevent damage to body sides.
6) One external operated lock, with key per door opening, shall be provided.
7) All patient compartment door locks shall be identically keyed.
8) Hardware shall be weather resistant.
9) Ambulance body, side and rear door hardware, installed by the ambulance body manufacturer, shall be tested to ensure installation meets or exceeds the requirements of AMD Standard 002.

3.10.10 FLOOR
1) The floor shall be flat, except when the area near the rear entrance door is sloped for a lower entering height.
2) With the exception of cot related hardware, shall be unencumbered in the door(s) access and work area.
3) Floor will be shall tested to AMD Standard 020.
4) Metal floors shall be reinforced to eliminate "oil canning".
5) Floors shall be insulated against outside heat and cold.
6) The sub floor of the modular body patient compartment shall be water resistant.
7) When plywood is utilized, it shall be water resistant
   a) Not less than 1/2 in. thick, 5 ply minimum.

b) Shall be supported by body framework.

8) Under the sub floor of the modular body shall be an aluminum heat shield/splash pan, minimum 0.050", sealed with silicone or other non-hardening sealant evenly distributed around its perimeter.
9) The sub floor of the Type II patient compartment shall be not less than 1/2 in. thick density, marine or exterior grade plywood.
10) Fiberglass, aluminum, or other non-hydroscopic composites, with at least the equivalent strength of plywood may be used as the sub floor.
11) Particleboard or equivalent type materials are not acceptable.
12) Voids or pockets, where water or moisture can become trapped to cause rotting and unsanitary conditions, are not acceptable.
13) Voids and pockets shall be filled with sealer or caulking compound.
14) Flooring shall extend the full length and width of the patient compartment or body (including space under the cabinets, unless otherwise insulated) or prevented by exterior compartment bodies or wheel wells that extend above floor level.

3.10.11 FLOOR COVERINGS AND COLOR

Floor covering shall be easily cleaned, sanitized, and harmonize with the interior color and décor of the patient compartment. The floor covering shall be seamless, one piece, no wax type, solid linoleum, vinyl, or poured epoxy or acrylic not less than 1/16 in. thick and permanently applied to the sub floor. The floor material shall cover the entire length and width of the compartment's working area. The covering of joints (corners, etc.), where the sidewalls and covering meet, shall be sealed and bordered with corrosion resistant cove molding or the covering shall extend at least 3 in. up the sidewalls.

3.10.12 STEP WELL (SIDE DOOR)

When a side entry door is furnished steps shall be provided in the door openings. Step well shall be the enclosed two-step type. Height of the bottom step shall not exceed 22 in. Step wells shall be lighted and all step surfaces shall be constructed with anti-slip material.

3.10.13 WHEELHOUSINGS

Wheel housings of modular bodies shall include metal or plastic splash shields between the body wheel housing and the wheels extending over the top of the tires to the bottom of the body side skirting. Wheelhouse openings shall allow for tire chain usage and easy tire removal and service. Chassis manufacturer's standard wheel housings will be acceptable.

3.10.15 BULKHEAD/ PARTITION FOR TYPE II, III, and III AD VEHICLES

A full height and width partition or bulkhead (with or without compartments), with a walkthrough opening with a door shall be placed between the driver and patient's compartment. This partition shall be located directly behind the driver and companion seats when in the rearmost position. The partition shall be secured on the sides, ceiling, and floor by welding or bolting to tapping plates.

3.10.15.1 DOOR / WALKTHROUGH FOR TYPE II, III, and III AD VEHICLES

The door opening shall be at least 17 in. wide and 46 in. high and shall provide an aisle between the compartments. The door shall have at least a 150 square in., transparent, shatterproof viewing panel in the center section at the driver's eye level. The door shall be secured with a driver's side self-latching device in the open and closed positions.

3.10.16 INSULATION

The entire body, sides, ends, and roof of the patient's compartment shall be completely insulated to enhance the performance of the environmental systems and prevent external noise from entering the vehicle interior. The insulation shall be a non-settling type, vermin-proof, mildew-

proof, fire retardant, non-toxic, and non-hygroscopic. If fiberglass insulation is used, it shall not be exposed to water, e.g. door panels.

3.10.17 INTERIOR SURFACES
The interior of the body shall be free of all sharp projections. All hangers or supports for equipment and devices shall be mounted as flush as possible with the surrounding surface. Interior body lining and cabinetry materials, excluding the cab compartment, shall be selected to minimize dead weight.

The finish of the entire patient compartment, including interiors of storage cabinets, shall be:

1. impervious to soap, water and disinfectants
2. mildew resistant
3. fire resistant
4. easily cleaned/disinfected (carpeting, cloth, and fabrics are not acceptable)

3.11 STORAGE COMPARTMENTS
Storage compartments shall be furnished for all items required by this specification and/or specified by the Participating Public Agency and include storage for, but not be limited to; backboards, portable cots/litters, stair chairs, and any other specified patient handling devices. Any absorbent material such as carpeting, fabric, or inside/outside plastic type carpeting, etc. that resists cleaning and decontamination shall not be used in any storage or patient compartment.

3.11.1 INTERIOR STOWAGE ACCOMMODATIONS
The interior of the patient compartment shall provide a minimum volume of 35 cubic feet of enclosed stowage cabinetry, compartment space, and shelf space which shall be conveniently located for medical supplies, devices, and installed systems as applicable for the service intended. Enclosed compartments and spaces shall be located at, in, or on the partition, sidewalls, overhead, seating areas, and doors. Compartment(s) under the floor, with opening panel(s) inside the patient compartment, shall not be acceptable. When furnished, top opening squad bench lids shall be fitted with an automatic hold open device and a quick release slam type latching device when closed.

3.11.1.1 LOCATION OF MEDICAL EQUIPMENT AND SUPPLIES
Supplies, devices, tools, etc., shall be stored in enclosed compartments and drawers designed to accommodate the respective items. All medical devices and equipment shall be stowed or properly fastened in/on the action area or in cabinets to prevent items from becoming projectiles in the patient compartment that can cause injury while the vehicle is in motion.

3.11.1.2 WASTE AND SHARPS DISPOSAL
The following shall be furnished: A trash receptacle compartment, with closure over opening, for general waste shall be furnished with a plastic/rubber trash can and disposable plastic liners, with 12 spare liners. The trash compartment shall be accessible to the EMSP seat. A sharps receptacle compartment/storage or a commercially available container mounted in a convenient area shall be furnished for retention of a sharps container with OSHA 1910.1030.

3.11.2 EXTERIOR STORAGE ACCOMMODATIONS
.Ambulances with exterior storage compartments shall be weather resistance and tested to AMD 010. Exterior compartment doors and hardware shall be flush or near flush style construction. All doors shall have spring or gas tube type, hold open devices that permit one hand closure. Hardware (hinges, locks, latches, etc.) shall be rust resistant. All exterior compartments shall have latches with locks and shall be keyed alike. All exterior compartments shall be automatically lighted when opened.

3.11.3 STORAGE COMPARTMENTS AND CABINETS DESIGN

Storage cabinets, drawers, and kits shall be easily opened but shall not come open in transit. For rapid identification of contents, medical supply cabinets above the litter patient shall have shatterproof, transparent or lightly tinted, sliding doors.

1) Doors shall be provided with near flush grip, or low profile handles.
2) Storage compartments shall be divided into sections.
   a) Drawers shall be marine style slide or tilt.
   b) All shelves shall be removable.
3) Sliding doors for cabinets designed to carry lightweight items such as dressings, bandages, etc. shall be furnished
   a) Shall automatically latch or be fitted with friction holding devices when in a closed position.
4) Doors shall have positively locked latches that are bolted to the door and the door frame structure and are designed to remain closed during transports.
   a) Use of sheet metal or wood screws is not acceptable.
5) All cabinets shall be firmly anchored (bolted or welded) to tapping plates of the body structure.
6) Tops of the cabinets and shelves shall be surrounded by a lip of not less than 1/2" in height covered in a soft, pliable molding.
7) Storage for the main oxygen cylinder shall be accessible for replacement from an outside position.
8) The oxygen compartment shall be provided with at least a 9 sq. in. of open vent to dissipate/vent leaking oxygen to the outside of the ambulance.
9) Oxygen cylinder compartment shall not be utilized for storage of any other equipment.
10) Oxygen cylinder(s) shall be mounted with a restraining device(s), as required to meet the tests of AMD Standard 003, Oxygen Tank Retention System.

3.11.4 PATIENT COMPARTMENT SEATING

All seats in the patient compartment shall conform to applicable FMVSS Standards, will be padded and have the largest practical padded back and headrests. Padding material shall be rubber or polyester urethane foam of a medium to firm density, with a minimum finished thickness (padding and upholstery) of 2.5 in. for seat pads, and 2 in. for head and backrests. All padding and upholstery shall be fire retardant. The upholstery shall be non-absorbent, washable and impervious to disinfectants. Non-OEM seats shall have 40 oz. (minimum) reinforced vinyl upholstery. To facilitate cleaning and disinfecting, all seats furnished and installed by the ambulance manufacturer shall be cleanable to OSHA standards, and all exposed surfaces shall be free of vent devices that would permit the entrapment of biological contaminates.

All seating positions in the patient compartment shall be provided with a vertical overhead clearance measurement of 43” as described in AMD Standard 026.

3.11.4.1 PATIENT SEATING

For modular bodies, the seats shall provide seating space for two persons and shall not be less than 15” deep by 18” wide (per seating position), and the seat backs shall be a minimum of 18” wide by 18” tall.

3.11.6 SEAT SAFETY BELTS AND ANCHORAGES

All designated seating positions in the patient compartment shall be equipped with safety restraint systems appropriate for each type of seating configuration.

3.11.7 LITTER FASTENERS AND ANCHORAGES

A crash stable cot fastener assembly with quick release latch shall be furnished. The installed cot fastener device(s) for wheeled cots shall be tested to comply with AMD Standard 004, Litter

Retention System. Additional cot related hardware is permitted, provided the patient compartment exit/entry is not encumbered with the cot in place. The furnished devices shall have a bright colored finish, if the device presents a tripping hazard in the entry/exit area when the cot is removed.

ALL COTS AND INFANT TRANSPORTERS SHOULD ONLY BE USED WITH THE PERSCRIBED FASTENER ASSEMBY AS PRESCRIBED BY THE COT MANUFACTURER. FASTENER AND COT INSTALLED AND CERTIFIED TO AMD STANDARD 004. THIS IS A TYPE CERTIFICATION.

3.11.9 IV HOLDER FOR INTRAVENOUS FLUID CONTAINERS

One ceiling mounted "hook" style device specifically designed for holding IV containers shall be provided, including Velcro type straps to adequately secure an IV bag/bottle. The device shall not protrude more than 1 in., and shall be located adjacent to, or on the cabinetry near the head of the primary patient. Swing down IV hangers with rigid support arms that can cause injury shall not be specified or furnished.

3.12 OXYGEN, MAIN SUPPLY AND INSTALLATION

The ambulance shall have a piped medical oxygen system capable of storing and supplying a minimum of 3,000 liters of medical oxygen. The installed medical oxygen piping shall be leak tested to 80 PSI. After the successful completion of piping test, the system shall be completely assembled and the flow rate of the outlets tested with the system pressurized at normal working pressure. The system shall be capped then tagged with date and signature of person and firm performing the tests.

The main oxygen supply shall be from a compressed gas cylinder(s) that the consignee will provide and install at the time the vehicle is placed in service.

A cylinder changing wrench shall be furnished. The wrench shall be chained, and clipped within the oxygen cylinder compartment.

The cylinder controls shall be accessible from the inside the vehicle. A device shall be visible from the EMSP's seat that indicates cylinder pressure. The use of remote high pressure lines and gauges are not allowed. The oxygen cylinder(s) shall be accessible for changing from the exterior of the body.

The Participating Public Agency shall specify the type of quick disconnect, to be used. The contractor shall install all other components and accessories required for the piped oxygen system which shall include as a minimum:

- A pressure regulator
- Low pressure, electrically conductive, hose, and fittings approved for medical oxygen.
- Oxygen piping concealed and not exposed to the elements, securely supported to prevent damage, and be readily accessible for inspection and replacement.
- Oxygen shall be piped to a self-sealing duplex oxygen outlet station for the primary patient with a minimum flow rate of 100 LPM at the outlet.
- The duplex oxygen outlet shall be located within 35" from the center of the patient's head when in the supine position with the cot located in the position closest to the action wall.
- Outlets shall be marked and identified and not interfere with the suction outlet.

3.12.1 OXYGEN PRESSURE REGULATOR

The medical, oxygen pressure reducing, and regulating valve with inlet filter at the cylinder shall have line relief valve set at 200 psi maximum, and a gauge or digital monitor with a minimum range of 0 to 2,500 psi with the gauge or display scale graduated in not more than 100 PSI increments. The regulator shall be easy to connect and preset, with a locking adjustment, at 50 +/- 5 psi line pressure.

3.12.2 SUCTION ASPIRATOR, PRIMARY PATIENT

An electrically powered suction aspirator system shall be furnished. The vacuum contron, vacuum indicator and collection bottle or bag shall be located so that the EMSP can properly operate the device from the EMSP seat. The electric type aspirator system shall be connected per Figure 3.

The suction pump shall be located in an area that is accessible and vibration insulated from the patient compartment.

1) The pump shall be vented to the vehicle's exterior.
2) A vacuum control and a shut-off valve, or combination thereof, shall be provided to adjust vacuum levels.
3) A vacuum indicator gauge graduated at least every 100 mm Hg and a minimum total range of 0 to 760 mm Hg, shall be provided.
4) The collection bottle or bag shall be non-breakable and transparent with a minimum 1,000 ml capacity.
5) The minimum inside diameter for the suction tubing connectors shall be at least 1/4 in. The end user shall provide any suctioning catheters desired.
6) The suction aspirator system shall provide a minimum of 30 LPM flow at the catheter tip.

3.13 ENVIRONMENTAL: CLIMATIC AND NOISE PARAMETERS

3.13.1 ENVIRONMENTAL SYSTEMS

All ambulances will be equipped with a complete HVAC system(s) to supply and maintain clean air conditions and specified level of inside temperature in both driver and patient compartments. The various systems for heating, ventilating, and air conditioning may be separate or a combination system, which will permit independent control of the environment within the driver's cab and patient compartment. All ambulances will be equipped with heating, ventilating, and air conditioning systems that can be made to collectively operate using re-circulated air and outside ambient air and will be capable of maintaining interior temperature of 68° F to 78° F. The ambulance must conform to the testing requirements as specified by AMD Std. 012. The air systems will be high volume capacity with low velocity delivery for minimum draft circulation. Environmental system components will be readily accessible for servicing at the installed location(s). Connecting hoses for heating and the air conditioning system will be supported by rubber-insulated metal clamping devices at least every 18 in.

3.13.2 HEATING CRITERIA

The heating system(s) will have sufficient capacity to simultaneously raise the temperature in each compartment, to a minimum dry bulb temperature of 68° F, within 30 minutes. The testing must conform to the type testing requirements as specified by AMD Std. 012. Heater(s) will, to the maximum extent possible, be connected to the chassis manufacturer's furnished interconnection points.

3.13.3 AIR CONDITIONING CRITERIA
The air conditioning system(s) will have sufficient capacity to simultaneously lower the temperature in each compartment to a maximum dry bulb temperature of 78° F, within 30 minutes. The testing must conform to the type testing requirements as specified by AMD Std. 012. When available, chassis manufacturers' interconnection points will be utilized.

3.13.4 VENTILATION CRITERIA
Ventilation system(s) of the driver and patient compartments will provide a complete change of ambient air within both compartments with the vehicle stationary. Ventilation will be separately controlled within the cab and patient compartments. Fresh air intakes will be located towards the front of the vehicle and exhaust vents will be located on the upper rear of the vehicle. Exhaust vents may be located on the rear lower half of the module/body, provided the vent/device incorporates a reverse flow damper to prevent back draft and intrusion of vehicle engine exhaust, dust, dirt, or road spray. The patient compartment will be ventilated by the air delivery system of the environmental equipment (heater-air conditioner) or by separate system(s), such as power intake, exhaust ventilator(s).

3.13.5 ENVIRONMENTAL CONTROLS
Adjustable, manual or thermostatically operative controls will permit heating and/or air conditioning and ventilation in either compartment without affecting the other compartment. Switches and controls will be located in "action area" panel and/or remote panel and identified for function and operating position. Blower or fan system will have at least three speeds (excluding "OFF"). Separate non-corroding brass, bronze, stainless steel, plastic or other inherently corrosion proof shutoff valves, for the patient compartment hot water heating system, will be provided. The use of vacuum or electrically operated shutoff valves is acceptable provided it will meet the above criteria and the valve provides inherent sealing when vacuum is removed. This sealing will prevent engine cooling system pressure and water pump pressure from causing any leakage when vacuum is removed. Air systems will have adjustable louvers to direct the flow of air.

3.13.6 PATIENT COMPARTMENT SOUND LEVEL CRITERIA
The patient compartment decibel level will not exceed 80 dB and will be certified to conform to the type testing requirements in accordance with AMD STANDARD 006.

3.14 COMMUNICATIONS

3.14.1 COMMUNICATION EQUIPMENT
Any two way radio equipment shall be installed by a licensed installer approved by the radio manufacturer. Communications equipment will meet the applicable FCC rules and required state and local area EMS radio communication protocols.

3.14.2 RADIO (MOBILE) PROVISIONS
All ambulances will be provided with sufficient ventilated space for a two-way radio (including convenience features), antenna openings, ground plane, terminal wiring for 12V power and ground.

3.14.3 ANTENNA CABLE, AND ACCESS
The contractor shall provide each ambulance with a ground plane, and coaxial lead-in wire from the ventilated radio storage area/compartment to the centerline of the patient compartment roof. An antenna wiring access/port shall be provided in the patient's compartment directly under the coaxial leads. The port shall provide a least a 16 square inch clear access. All nonmetallic roofs will be equipped with at least a 40" x 40" metal ground plane molded into the roof. The ground plane then shall be properly grounded to the chassis ground. The antenna cable (lead-in) shall be provided and clearly labeled with RG/58U or equal cable. Approximately 18" of extra cable shall be provided at the roof and approximately 36" at/in the radio area/compartment.

3.14.4 SIREN - PUBLIC ADDRESS SYSTEM

A combination electronic siren with integral public address system including radio interface capability shall be provided. A "Horn/Siren" switch shall be provided on the driver's console. When on shall activate or change the siren tone when the horn button is pushed. The "Horn/Siren" switch shall be illuminated (in siren mode). Dual speakers shall be installed, outside the vehicle, in the bumper/hood area. Speakers shall not protrude beyond the face of the bumper or bumper guards. System shall meet AMD Standard 023 for siren system.

3.15 ADDITIONAL SYSTEMS, EQUIPMENT, ACCESSORIES, AND SUPPLIES

3.15.1 ADDITIONAL AND OPTIONAL EQUIPMENT

This standard provides the minimum technical requirements that new ambulances are required to meet. Some Participating Public Agencies will require features in excess of these minimum requirements to complete their mission(s). Completing the worksheet in this section will assist Participating Public Agencies in determining the optimum type, configuration and optional equipment required.

Participating Public Agencies may wish to consider some of the following criteria before completing the worksheet:

1. Operating environments such as inner city, rural areas, length of responses
2. Size of ambulance crew
3. State or Local jurisdiction required medical equipment
4. Vehicle size and weight limitations in the response area
5. Expected service life of the Ambulance
6. Additional non EMS equipment that must be carried on the Ambulance
7. Future equipment requirements
8. Additional state or local requirements
9. Export requirements

In no event shall the specified or furnished optional item(s) reduce the quality and intent of the ambulance but shall enhance its design and purpose. The materials, devices, items, and fabrication, if not specifically described, shall be not less in quality, strength, performance, and service than those normally provided by the most reputable manufacturers.

3.15.2 STANDARD MANDATORY MISCELLANEOUS EQUIPMENT.

Each ambulance shall be equipped with, but not limited to the following:

1. Fire extinguishers: Two, (ABC dry chemical or carbon dioxide) minimum 5 lb. unit, in a quick-release bracket.
2. "No Smoking Oxygen Equipped" and "Fasten Seat Belts" signs: Conspicuously placed in the cab and patient compartment.
3. Overhead grab rail, minimum 60 in. long, maximum 4 in. depth, on the ceiling over the primary patient. Grab rail shall be stainless steel, aluminum, or other corrosion resistant material, and have padded or curved up ends, and rounded corners. Mounting brackets shall be chromed, stainless steel, polished cast aluminum or other corrosion resistant materials. The grab rail shall be tested in accordance with AMD Std. 008.
4. Backup alert alarm, (audible warning device) activated when the vehicle is shifted into reverse. Device shall be rated (SAE) for 97 dba at 4 feet.

3.15.3 CONFIGURATION WORKSHEET

Seats and restraints should be designed to allow all EMSPs to reach common and critical equipment with at least one hand at a maximum functional reach from a seated and restrained position. This includes a 5th female EMSP with a maximum functional reach of 43.2 in. as measured from the junction of the seat pan and seat back to the thumb tip of the arm fully extended parallel to the floor while leaning at a maximum 45° angle. (See figure 6)

Exterior and interior access handrails should be constructed of or covered with a slip-resistant noncorrosive material that can be sanitized and cleaned.

Restraint systems should be as follows:

1. The restraint system's unfastening mechanism should require only one motion or click with only one hand to operate.
2. The restraint system's fastening mechanism should require minimal steps to operate.
3. The restraint system should be adjustable to prevent pressure on the throat or other sensitive areas.
4. Fully exposable for sanitation and cleaning.

Surface materials and their colors used in the patient compartment should allow EMSPs to distinguish clean from soiled surfaces.

Handholds that minimize striking hazards should be installed over each walking path down the length of the patient compartment.

Reference Section 3.0 REQUIREMENTS

This ambulance is to be a:

- ☐ BLS
- ☐ ALS
- ☐ Walkthrough
- ☐ Infrequent Transport

1. Specify the maximum number of seated positions on the ambulance if more than 5 for modular bodies, or more than 3 for Type II units (Standard seating is 2 in the cab, 2 on the side and 1 in the EMSP seat for modular bodies and 2 in the cab and 1 in the EMSP seat for Type II units):

_____

2. Describe the usage duty cycle that the ambulance will be subjected to: _____

_____

3. If design approval drawings and/or a copy of the manufacturer's work order are required to validate the design criteria in 3.1, the type and quantity must be detailed here. _____

_____

4. If different than 3.4.2, state the minimum and/or maximum operating temperatures in degrees F._____

5. If different than 3.4.4, state the required performance requirements: _____

_____

6. If different than 3.4.6, state the required min/max road speed required: _____
_____

7. If different than 3.4.8, state the required gradeability:_____

8. If different than 3.4.9, state the required fuel range:_____

9. Per 3.4.11.1, state the maximum overall length in inches:_____

10. If different than 3.4.11.2, state the maximum overall width in inches:_____

11. Per 3.4.11.3, state the maximum overall height in inches:_____

12. If different than 3.4.11.5, state the required angles:_____

It is essential that the ambulance not be operated in an overloaded or unbalanced condition. The following information must be made available to properly design the interior and exterior compartmentalization of the ambulance per section 3.5. Attach:

1. A list of medical & rescue equipment to be supplied by the contractor with the ambulance stating the item, quantity, where it is to be mounted or carried, the weight of each item, and its dimensions (L × W × D).
2. A list of medical & rescue equipment to be supplied by the Participating Public Agency to be carried on the ambulance stating the item, quantity, where it is to be mounted or carried, contractor's responsibility for mounting, the weight of each item, and its dimensions (L × W × D).
3. A list of medical & rescue equipment that might be carried on the ambulance in the future stating the item, quantity, the desired mounting location or compartment where it is likely to be carried, the weight of each item, and its dimensions (L × W × D).
4. A list of permanently mounted equipment required on the ambulance showing the item, quantity, weight of each, and dimensions (L × W × H), who is to furnish the equipment as well as the location where it is to be carried.

13. Per 3.5.2, the average weight of an occupant is calculated at 150 lbs. per NHTSA. If your average occupant weight is greater, specify here:_____

14. If a specific manufacturer's chassis is required in section 3.6, list the manufacturer here: _____
_____

15. If all wheel drive (AWD) or all wheel drive conversion (AWDC) is required specify here. (it should be noted that AWD and AWDC will reduce the available payload and will increase the floor loading height. In some cases the floor loading height may be increased beyond the 34" maximum recommended by the cot manufacturers)_____

16. A diesel engine is furnished as standard per 3.6.3. If other than a diesel engine is to be used, specify here. If a specific engine type is required, specify here: _____

17. The OEM standard exhaust location and piping configuration is required per 3.6.4.6. If an alternate location of type of piping termination is required, specify here: _____

18. An automatic transmission is furnished as standard per 3.6.5.2. If a specific transmission type is required, specify here: _____

19. The OEM standard braking system is required per 3.6.5.7. If an optional type braking system is required (air brakes, retarder, exhaust brake, etc.), specify here: _____

_____

20. The OEM standard tires are furnished per section 3.6.8. If an optional type tire is required, specify here. If a spare tire is required, specify mounting location here: _____

_____

21. If automatic or manual tire chains are to be furnished to operate in the space required by 3.6.11, specify here: _____

_____

22. If different than 3.7.5, specify the type of horn (air horn, etc.) required: _____

_____

23. Specify any electrical loads beyond those defined in 3.7.6 that are to be part of the minimum continuous electrical load. If a load management system is required, specify the sequence of control (shutdown): _____

_____

_____

24. The OEM standard batteries are furnished per section 3.7.7. If an optional type battery is required, specify here. If a specific mounting location is required, specify here: _____

_____

25. Specify any portable equipment charging provisions required in excess of those required by 3.7.7.2: _____

_____

26. If different than 3.7.7.3, specify the number and type of power points required: _____

_____

27. Specify any AC utility power requirements that are in excess of those required in 3.7.8: _____

_____

28. If an on board AC power system is required to operate with the system described in 3.7.8, the following must be specified:

Wattage of power source: _____

Voltage of power source: _____

Purity of power source: _____

(allowable total harmonic distortion, voltage variation, power factor, frequency variation, etc)

Type of power source (shall be listed by a nationally recognized testing laboratory UL, CSA, etc):

- ☐ Portable Generator
- ☐ Hydraulically Driven Generator
- ☐ Direct Drive Generator
- ☐ Auxiliary Engine Driven Generator
- ☐ Belt Driven Generator or Alternator
- ☐ Derived From Ambulance Low Voltage Power Supply System (Inverter)
- ☐ Other: _____

Make, model, or other details of power source: _____

_____

_____

Panelboard location: _____

_____

_____

AC Powered Receptacle Information

Quantity	NEMA Conf	Location

AC Powered Lighting Information

Style/Make	Location	Wattage/Bulb	Type Mounting

An automatic transfer switch shall be furnished which turns off this onboard AC supply (interlock) and disconnects its output, when the AC utility power is applied. Transfer equipment, if not integral with the listed power source, shall be installed to ensure that the current carrying conductors from the on board 125-volt AC power source and from the 125-volt AC utility power source are not connected to ambulance electrical circuit at the same time. Generators shall comply with Article 445, "Generators," of NFPA 70, *National Electrical Code*.

The following shall be wired so that they can be energized only from the utility power, and not the onboard AC supply:

1. DC battery conditioner
2. Engine block heater

29. If different than 3.7.8.1, specify the location for the utility power connector: _____

_____

30. If known, specify the equipment that is to be powered by the receptacles specified in 3.7.8.2: _____

_____

31. If different than 3.7.10, specify the location(s) for the patient compartment controls: _____

_____

32. If a specific manufacturer's DOT lighting system is required in section 3.8.1, list the manufacturer here. State if a specific lighting system is required (such as all LED, etc.): _____

_____

33. If a specific manufacturer's emergency lighting system is required in section 3.8.2, list the manufacturer and type (i.e.: strobe, LED, halogen) here. State if an alternate approved lighting system is required (such as NFPA 1901 compliant or SAE J2498 compliant). State if there are specific state or local jurisdiction requirements (such as California steady burning red, etc): _____

_____

34. Specify any work lighting required beyond those defined in 3.8.3: _____

_____

_____

35. Specify any interior lighting required beyond that defined in 3.8.5 (map light, high intensity cot light, etc.): _____

_____

_____

36. The manufacturer's standard cab console will be provided per 3.9.1. If an optional type console is required (specific switch locations, specific size, etc.) specify here: _____

_____

_____

37. The OEM largest mirror system is required per 3.9.5. If an optional type mirror system is required (power, heated, etc) specify here: _____

_____

38. If different than 3.10.4, state the required increase to the patient compartment interior dimensions:_____

39. An aluminum modular body is required per 3.10.5. If an optional type body material is required specify here: _____

_____

40. Hinged doors are required per 3.10.8. If an optional type door system is required (sliding, etc) specify here: _____

_____

41. If a specific manufacturer's latch, locking system, grab handle system, etc. is required in section 3.10.9, list the manufacturer and type here: _____

_____

42. The floor is designed to carry a cot load of 400 pounds per 3.10.10. If a heavier load is to be applied to the floor (Bariatrics, etc) specify here: _____

_____

43. If a specific manufacturer's flooring is required in section 3.10.11, list the manufacturer and flooring type here: _____

_____

44. Windows are required per 3.10.14. If an optional window and/or tint is required specify here: _____

_____

45. All exterior compartments must be lighted per 3.11.2. If additional compartment lighting is required, specify here: _____

_____

46. Removable shelving is required per 3.11.3. If optional type shelving is required (adjustable, quick loading, etc) specify here: _____

_____

47. Patient compartment seating is required per 3.11.4. If an optional type seating is required (captain's chair, integral child safety seat, etc) specify here: _____

_____

48. A cot fastener assembly is required per 3.11.7. Specify the type of cot to be fastened by manufacturer and model number. If a cot is to be furnished by the contractor, specify the manufacturer and model number of the cot to be furnished: _____

_____

49. A medical oxygen system is required per 3.12. Specify the type of outlets (DISS, NCG, Chemtron, Ohmeda, Puritan Bennett, etc) to be furnished. Specify the type and size of oxygen cylinder that will be furnished by the end user. If additional oxygen equipment is to be furnished by the contractor, specify the manufacturer and model number to be furnished. If additional oxygen storage (more than 3000 liters) is required, specify here: _____

_____

50. The patient compartment interior sound levels are not to exceed 80 dB per 3.13.7. If lower sound levels are required specify here: _____

_____

51. If electronic communication between the patient compartment and the cab is required (silent intercom, voice intercom, headsets integrated with the radio system, etc) are required specify here: _____

_____

52. Provisions for mobile radio equipment are defined in 3.14.2. Complete the following:
Is the manufacturer to provide the radio? ☐ Yes ☐ No
Is the manufacturer to install the radio? ☐ Yes ☐ No
Make and model: _____
Power requirements for radio: _____
Mounting location for radio: _____
Mounting location for control(s) and speaker(s): _____

_____

53. Are there provisions required for computer equipment or other electronics? If so, list here: _____

_____

_____

54. If a specific manufacturer's siren and/or control system is required in section 3.14.6, list the manufacturer here: _____

_____

55. Specify any additional backup assist systems required beyond those defined in 3.15.2.4: _____

_____

_____

56. The ambulance will be painted and marked per 3.16. State if an alternate approved painting and/or marking system is required (such as NFPA compliant and/or specific state or local jurisdiction requirements). A graphic design meeting the reflectivity requirements of 3.16.4 shall be permitted to replace the required striping material if the design covers at least the same perimeter length and total area of coverage in square inches required by 3.16:

_____

_____

57. Each ambulance comes with an instruction manual and handbook of construction per 3.20. These documents are designed to insure that the operator of the ambulance can properly operate and perform required operator level maintenance specific to the ambulance purchased. If additional operational instruction and/or maintenance instruction is required, those requirements should be

detailed here. If actual service and parts manuals are required, those requirements should be detailed here. With a few exceptions, the manual and handbook of instruction will be in electronic form. If other media is required (all paper, etc.) specify here: _____

_____

Reference Section 4.0 QUALITY ASSURANCE PROVISIONS

The type of inspection (source and/or destination) needs to be specified as well as where and when is the acceptance inspection is to occur? _____

_____

_____

Section 4.3.4 requires 3rd party testing. If an alternate form of 3rd party validation of the testing is required, specify here: _____

_____

_____

Reference Section 5.0 PREPERATION FOR DELIVERY

If a different mode of delivery or preparation for delivery than is specified in section 5.0 the requirements should be detailed here along with the delivery address for the ambulance._____

_____

Reference Section 6.0 NOTES

If an extended warranty (beyond what is required in 6.4.3) on the entire vehicle or specific components is required, indicate which component(s) and the length and scope of the warranty:

_____

_____

_____

3.15.4 DEFINED OPTIONS

The following Option Code detailed requirements are offered for selected Ambulance options.

3.15.4.1 Code "SL" SPOTLIGHT

A hand held spotlight shall be provided with a minimum 100,000 CP lamp, corrosion proof housing with momentary switch, and minimum 8 ft. heavy-duty coiled cord. It shall be hard wired to the vehicle 12-volt DC system (for anti-theft reasons) and stowed in a holder in a compartment/area, accessible to the driver and passenger.

3.15.4.2 CODE "HPL" PADDLE HANDLE DOOR LATCHES

When code HPL is specified, a large automotive paddle style door handle shall be furnished for the patient entry and exterior compartment doors. The handle shall be chrome or bright metal finished and shall have a black outer trim gasket. Each handle shall be easily gripped with a gloved hand. The patient entry doors and exterior compartment doors shall be keyed alike.

3.15.4.3 CODE "K40" SERVICE BEFORE OVERSEAS
When option K40 is specified, vehicles scheduled for overseas delivery shall be shipped to the ambulance manufacturer's service center closest to the port of shipment. The service center shall ensure that the following services are performed:

1. A 3000 mile chassis service
2. The OEM and Conversion equipment functions on the predelivery check list shall be successfully completed
3. All open warranty items discovered as a part of this service shall be resolved
4. The dealer shall deliver the vehicle to the port of shipment when the required services have been completed.

3.15.4.4 CODE "PLV' POWER LOCKS ON BODY
When code PLV is specified, the side and rear patient entry doors as well as the front exterior ALS access door shall be equipped with electrically activated locks. These locks shall be interconnected to the chassis OEM electric locks so that patient compartment and ALS access areas may be secured anytime the chassis is locked. There shall further be a momentary activation switch located to the rear of the side wall adjacent to the rear patient entry doors. Switch shall be labeled Door Locks. Additionally there will be a rubber covered, weatherproof "stealth" switch that will unlock both the cab entry doors as well as the patient compartment entry doors. Switch shall be located in the front grille area.

3.15.4.5 CODE "PSM & PSME" PARTS AND SERVICE MANUALS
When PSM or PSME is specified, the contractor shall furnish all parts lists and service publications for the vehicle and all equipment furnished.

When PSM is specified, the publications furnished shall be printed documents.

When PSME is specified, the publications shall be electronic (CD or web-based)

NOTE: The publications may be shipped separately from the vehicle. The publications may be shipped to the consignee mailing address as shown on the MVDO.

3.15.4.6 CODE "SROV" Reverse Obstacle Sensor

When code SROV is specified, the vehicle shall be furnished with a sensor system that is installed on the rear of the body or rear bumper of the vehicle and detects the proximity of objects and transmits an audible signal to the driver. A switch shall be furnished that allows the driver to turn this device on/off.

3.15.4.7 CODES "AWD & K02" OEM All Wheel Drive
When Option AWD is specified, the OEM 4X4 chassis shall be furnished per specification. When Option K02A is additionally specified, the chassis shall have OEM automatic electric "shift on the fly" system.

3.15.4.8 CODE "K11" REAR AIR RIDE SUSPENSION
When Option K11 is specified, chassis manufacturers furnished or approved rear air suspension, with electrically operated dump valve, shall be furnished. The air ride suspension system shall incorporate an interlock system that prevents the vehicle from moving while the system is in the "dumped" configuration.

3.15.4.9 CODE "K37" ADDITIONAL 12 VOLT POWER LEAD
When K37 is specified, an additional lead shall be furnished to a specified location. All leads shall be tagged.

3.15.4.10 CODE "K32" ADDITIONAL ANTENNA & POWER LEAD

When Option K32 is specified, an additional antenna and an additional power lead shall be furnished to a specified location. All leads shall be tagged.

3.15.4.11 CODE "K27" TEMPERATURE CONTROLLED DRUG COMPARTMENT
When K27 is specified, a temperature controlled drug compartment shall be furnished to maintain temperatures 77 degrees F +or– 20 degrees F. with the vehicle exposed to the ambient temperatures in 3.4.2. The electrical power for the cooling/heating shall be from the power output in Figure 3 and Figure 4.

3.15.4.12 CODE "K49" AC/12 Volt Heat & AC Comb
When code K49 is specified, the climate control system in the patient compartment shall be capable of operating from either AC power supplied by a 30 amp shoreline input or the 12 volt D.C. power supplied by the OEM chassis. The AC portion of the system shall include a Kussmaul 30 Amp Auto-Eject shoreline input outlet located on the street side of the vehicle and adjacent to the standard shoreline outlet. The 125 volt input shall activate an additional air conditioning compressor and condenser as well as an AC to 12 volt converter that will power the air conditioner blower motors inside the patient compartment. The AC portion of the system shall be connected to the interior heat/cool thermostat located in the action area. An AC auxiliary heater shall be installed underneath the attendant's seat.

3.15.4.13 CODE "K28" CAST ALUMINUM EMERGENCY LIGHT HOUSINGS
When code K28 is specified, all exterior emergency and flood lights shall be flush mounted in cast, polished, aluminum housings and recessed to the maximum extent possible.

3.15.4.14 CODE "FTH" FRONT TOW HOOKS
When code FTH is specified, the chassis manufacturer's front recovery hooks shall be frame mounted on the front of the vehicle. The chassis manufacturer's front recovery hooks shall be provided on all 4X4 vehicles.

3.15.4.15 CODE "PT" POWER TAKEOFF OPENING
When code PT is specified, the designated transmission or transfer case shall be provided with a usable PTO opening. When a PTO unit is provided on a vehicle, a caution plate or decal reading, "Do not operate vehicle at highway speeds with PTO engaged," shall be installed in the cab, readily visible to the driver. Controls to operate the power takeoff shall be located in the truck cab accessible to the seated driver. The PTO unit shall have a rated capacity to operate the provided equipment

3.15.4.16 CODE "PWL" POWER WINDOWS AND LOCKS
When code PWL is specified, the OEM power windows and power locks option shall be provided.

3.15.4.17 CODES "RA, RAD & RACD"
When code RA is specified, the OEM AM/FM radio with integrated clock shall be provided.

When code RAD is specified, the OEM AM/FM/clock radio with integrated compact disc player shall be provided.

When code RACD is specified, the OEM AM/FM/clock radio with integrated compact disc and cassette player shall be provided.

3.15.4.18 CODE "RKE" REMOTE KEYLESS ENTRY
When code RKE is specified, the OEM optional remote keyless entry system shall be furnished.

3.15.4.19 CODES "T5", AND "T6", FIVE, AND SIX SPEED MANUAL TRANSMISSION
When code T5, or T6 is specified, a five, or six speed manual transmission, respectively, shall be furnished. The transmission shall be furnished with a PTO opening(s) in accordance with SAE J704, unless an exception is noted under the code.

3.15.4.20 CODE "AWDC" FOUR WHEEL DRIVE (4x4) CONVERSION
(From OEM Pass Through Approved Dealers Only)
When code AWDC is specified, an OEM pass through four wheel drive conversion shall be furnished. The conversion (4x4) shall be a professionally engineered conversion from a two wheel drive (4x2) to a four wheel drive (4x4) meeting or exceeding all applicable requirements herein. All workmanship, welding, mechanical fit, grade and quality of components and materials used in conversion(s) shall be equal to or greater than the chassis manufacturer's production of other vehicles in the same weight class that are available as factory assembled 4x4 units. Conversion components shall not interfere with other body, chassis, or mechanical parts through the complete range of suspension and wheel angle travel and allow proper alignment of axles. The tracking and wheelbase of the front/rear axles shall be identical on both sides of the vehicle. When available, the chassis manufacturer's original equipment components for 4x4 units shall be furnished, including but not limited to: spring hangers, shackles, drive axle, integral transmission/transfer case, universal joints, steering linkage, stabilizer bars, radius and torque rods, transfer case shift linkage, brake calipers, pads, rotors, shock absorbers, and springs. The chassis manufacturer's guidelines/requirements for 4x4 conversions shall be followed. The conversion shall, at a minimum, maintain the payload as required for the Standard Item number furnished. The furnished axle ratings, as a minimum, shall provide the original or greater GAWR and GVWR. The design of the 4x4 conversion shall not raise the vehicle's center of gravity over that of the original vehicle, and chassis height shall not be raised more than 5 in. The transfer case selector shall have a readily visible shift diagram and a position indicator. A yellow, dash mounted 4 wheel drive warning light shall be provided in close proximity to permanent warning decal or metal plate advising conditions under which 4 wheel drive shall not be used. A dash mounted metal plate or permanent decal indicating the proper procedure for engaging and disengaging the 4 wheel drive shall be provided. The ratio of the front drive axle shall be identical +/- 1% of that furnished in the rear axle. The front drive axle hubs shall be manually engaged. Each vehicle's rear axle shall be furnished with chassis manufacturer's special traction differential (option code D3) when available. The 4x4 converter shall furnish a completed applicable FMVSS certification label as required for an Alterer, Intermediate, or Final Stage manufacturer. In addition to the required OEM manuals, the vehicle shall be provided with operation, maintenance, and 4x4 system specifications information.

The 4x4 converter shall provide to the Participating Public Agency a full parts and labor warranty covering all added 4x4 parts and materials, including workmanship and design. The warranty shall also cover all OEM components affected or modified by the conversion process. This warranty shall be at least equivalent, in mileage and time, to the chassis manufacturer's original warranty, including any extended warranties required or furnished.

3.15.4.21 CODE "RBV" RUNNING BOARD
When code RBV is specified, OEM running boards (Code RB) or vocational body contractor running boards shall be furnished. The vocational body contractor running boards shall be securely mounted to the frame of the vehicle to prevent flexing when used by vehicle occupants during entry and exit.

3.15.4.22 CODE "LEDV" BODY EXTERIOR DOT LIGHTING, LED
When code LEDV is specified, the exterior DOT lighting furnished, other than the backup lamp(s), shall be LED. The lighting system shall include sealed wiring harness with return ground wiring. LED lights shall be installed with tamper resistant hardware.

The LED lights shall have a 5 year warranty as a minimum.

3.15.4.23 CODE "SRP" RUSTPROOFING per FED-STD 297E
When code SRP is specified, the vehicle shall be rust proofed in accordance with FED-STD 297E

3.15.4.24 CODE "CPT" PAINT-CUSTOM COLOR

This option must be specified when ordering paint colors other than the standard white. The required color(s) must be stated.

3.15.4.25 CODE "UCT" UNDERCOATING
When code UCT is specified, the vehicle shall be undercoated be undercoated for sound deadening, corrosion, and stone damage protection. A commercial, sandless, undercoating or other materials providing equivalent protection, shall be applied to the underbody and under chassis sheet metal surfaces to a thickness of 1/16 to 1/8 in., except to the drive shafts, drain holes, lubrication points, engine/transmission oil pans, fuel tanks, heavy castings, suspension components, heat shields, heat diffusing devices, catalytic converters, and areas 12 in. or less from the exhaust system(s) as well as other areas specifically excluded by the chassis manufacturer. These areas shall be kept free of coating material. Chassis frame, underside of engine compartment hood, and underbody surfaces in excess of 1/8 in. thickness, or that is inaccessible without removing vehicle fuel tank(s) or other major components shall not require undercoating

3.15.4.26 CODE RESERVED

3.15.4.27 CODE "K12" AUXILIARY AIR CONDITIONING CONDENSER
When K12 is specified, an auxiliary condenser shall be provided which will allow for maximum system performance, based on the air conditioning and ambulance manufacturer's recommendations. If the condenser is located above the cab, it shall not block the emergency lights. All added refrigeration lines and fittings shall be mechanical fittings compatible with OEM components furnished by the chassis manufacturer.

3.15.4.28 CODE "SP" SKID PLATES
When code SP is specified, OEM protective plates, or shields, shall be provided when available. The skid plate(s) shall provide protection for at least the transfer case. The skid plates shall be demountable for service of the components they protect. Sufficient openings shall be provided to enable draining of transmission and servicing the underside of the engine.

3.15.4.29 CODE "WR" INCREASED GVWR
When code WR Is specified, the GVWR shall be increased by the OEM to the maximum level available

3.15.4.30 CODE "K46" Furnish "H" O^2 Cylinder in lieu of "M" Cylinder
When code K46 is specified, an "H" O^2 Cylinder shall be furnished in lieu of an "M" Cylinder

3.15.4.31 CODE "DVE2" FURNISH EXTRA INTERIOR HEIGHT
When code DVE2 is specified, the patient compartment interior height shall be increased to a minimum of 72 Inches.

3.15.4.32 CODE "K15C" REFLECTIVE CHEVRON
A minimum of 50% of the rear vertical surfaces of the apparatus shall be equipped with 4 inch alternating yellow and red chevron reflective striping sloping downward at an angle of 45° from the center of the vehicle

3.16 PREPARATION FOR PAINTING, COLOR, AND MARKINGS

3.16.1 PREPARATION FOR PAINTING

Ambulance body and all attached equipment exterior surfaces, except polished metal parts, shall be thoroughly cleaned, treated, and coated with a firm primer and preservative with rust inhibiting properties, and painted in the finish color as specified . Ferrous metal interior surfaces shall be painted or, when not exposed for painting, shall be treated or coated to resist corrosion. Chassis and chassis frame components shall be preserved and finished in accordance to industry's standard practice.

3.16.2 COLOR, PAINT, AND FINISH

The exterior color of the ambulance shall be gloss white in combination with a solid uninterrupted orange stripe and blue lettering and emblems. The stripe should be as close to parallel as possible with the road but a stripe transition angle is acceptable to connect the module beltline stripe with the chassis stripe. The exterior finish on painted metal modular bodies and metal roofs on Type II ambulances shall be an acrylic composition urethane or polyurethane paint. The final stage manufacturer's painted components shall have a paint film not less than 1.8 mils thick and a minimum total thickness of 2.6 mils including primers. The orange stripe shall not be less than 6 in. wide, nor more than 14 in. wide and shall encircle the entire ambulance body at the belt line below the bottom edge of cab windows but may exclude the front of the hood panel. The orange stripe shall be reflective tape. This single, solid band (except when interrupted by windows, locks, etc.), when viewed horizontally, shall appear as a stripe near parallel to the road. The interior finish shall be the manufacturer's standard light color harmonizing with the color of upholstery. After application of the final film of paint, the surfaces shall be smooth and uniform.

3.16.2.1 COLOR STANDARDS AND TOLERANCES

The exterior surface including the wheels shall be manufacturer's standard gloss white.

3.16.3 SALT SPRAY RESISTANCE

Treated exterior sheet metal of the ambulance body (except OEM Type II van) shall be capable of withstanding 250 hours of salt spray tested in accordance with ASTM B 117-03. The specimen used for the salt spray test shall be run through all steps of the cleaning and treating process, including priming. The primed specimen shall be scored from corner to corner using a sharp knife. After the test, the specimen panels shall exhibit no failure and not more than 1/8 in. rust or blister creepage from the scored lines.

3.16.4 REFLECTIVE EMBLEMS AND MARKINGS

The material for the emblems and markings shall be applied using reflective material that has a coefficient of retroreflection measured in accordance with ASTM E 810 of 100 for White and 10 for Blue using - 4 degree entrance angle and a 0.2 degree observation angle. The reflective color used shall be blue (color a) and white (color i) when applicable. The orange and blue markings shall be as specified Orange and Blue in American National Standard Z535.1, Safety Color Code. They shall comply with the tolerances expressed in terms of Munsell hue, value (lightness), and chroma (saturation). The emblems and markings shall be of the type, size, color, and location as follows:

A. Reserved

B. Side and rear markings

1. The word "AMBULANCE" shall be in block, blue, die cut style letters of not less than 6 in. in height, centered, with a white border, alongside or under the "Star of Life" on each side and rear of the vehicle body.
2. A "Star of Life", not less than 16 in., in blue, die cut style, with a white border, conforming to Figure 4 (size C), on the right and left side panels. A "Star of Life" emblem, size B, shall be provided on each rear door.

C. Top markings
A "Star of Life", of not less than 32 in. (size D) in blue, die cut style, conforming to Figure 4 (may be without the white Staff of Aesculapius), shall be provided on the ambulance rooftop.

3.19 MARKINGS, DATA PLATES, WARRANTY NOTICE, ETC
Final stage manufacturer's caution plates and identification plates shall be conspicuously installed for all equipment, etc., furnished requiring such notices. The ambulance/vehicle manufacturer's "Star of Life" certification shall be provided on a placard or label permanently affixed and easily visible.

Other than the manufacturer's trademark(s) names, no other identification than that specified shall be shown on exterior of the vehicle.

3.20 MANUALS, AND HANDBOOK OF INSTRUCTION
The contractor shall furnish with each ambulance one copy of a handbook of instruction in electronic media. This handbook shall contain all information and safety precautions to insure that the operator of the ambulance can properly operate and perform required operator level maintenance specific to the ambulance purchased. As a minimum, this handbook of instruction shall contain.

1. Table of contents
2. Copy of contractor's invoice showing date of delivery and conditions of sale
3. Manufacturer's "Star of Life" certification of compliance statement
4. Copy of Ambulance manufacturer's predelivery Inspection/test form signed by manufacturer's inspector
5. Copy of manufacturer's final (as built) work order.
6. Shipping papers.
7. List of ambulance manufacturer's service points
8. Final stage manufacturer's components and equipment information (hardware, fixture, etc.) including manufacturer's part numbers specific to the ambulanced purchased
9. Complete wiring diagrams and schematics for wiring added to the OEM chassis by the ambulance manufacturer
10. Chassis manufacturer's operator manual (may be in printed form if electronic form is not available from chassis manufacturer)
11. Equipment manufacturer's operator manual(s) for any equipment furnished with, or as a part of the ambulance (may be in printed form if electronic form is not available from chassis manufacturer)
12. All warranty information

If complete parts and service manuals are required for the ambulance, option PSM or PSME must be ordered.

3.21 PREDELIVERY INSPECTION AND SERVICING
The contractor prior to the acceptance and inspection of the ambulance(s) shall service and inspect each vehicle in accordance with the chassis manufacturer's approved predelivery form, and the ambulance manufacturer's predelivery (test, inspection, and road test) form. A signed copy of these forms (check sheets) shall be furnished with the vehicle. Servicing shall comply with ambient temperatures and conditions applicable with the route of transport to the consignee's ultimate destination. Servicing shall include all tank(s) full of fuel; checking to determine satisfactory and complete operation of all mechanical and electrical features, equipment and system; elimination of rattles, noises, and squeaks; cleaning the interior and exterior. Thus the vehicle shall be delivered ready to use.

3.23 WORKMANSHIP

A. Vehicles shall be free from defects that may impair their serviceability or detract from appearance.

B. All bodies, systems, equipment, and interfaces with the chassis shall be done in accordance with the OEM Body Builders Book.
C. Defective components shall not be furnished. Parts, equipment, and assemblies that have been repaired or modified to overcome deficiencies shall not be furnished without the approval of the Participating Public Agency. Component parts and units shall be manufactured to definite standard dimensions with proper fits, clearances, and uniformity. General appearance of the vehicle shall not show any evidence of poor workmanship.
D. The following shall be reason for rejection:
    1. Rough, sharp, or unfinished edges, burrs, seams, corners, and joints.
    2. Grit, seeds, orange peel, fish eyes, streaks, running, sagging, wrinkles, pin holes, craters in paint, failure to meet minimum thickness requirements and non uniformity of specified color.
    3. Body panels or components that are uneven, unsealed, or contain cracks and dents.
    4. Misalignment of body fasteners, glass, viewing panels, light housings, other items with large or uneven gaps, spacing, etc., such as door, body panels, and hinged panels.
    5. Improperly fabricated and routed wiring or harness.
    6. Improperly supported or secured hoses, wires, wiring harnesses, mechanical controls, etc.
    7. Interference of chassis components, body parts, doors, etc.
    8. Leaks of any gas, vacuum, or fluid lines (air conditioning, coolant, oil, etc.).
    9. Noise, panel vibrations, etc.
    10. Inappropriate or incorrect use of hardware, fasteners, components, or methods of construction.
    11. Incomplete or improper welding, riveting, or bolting.
    12. Lack of uniformity and symmetry where applicable.

4. QUALITY ASSURANCE PROVISIONS

4.1 RESPONSIBILITY FOR INSPECTION AND TESTS

The contractor is responsible for the performance of all inspections and test requirements specified. The contractor may use their own or any other facilities suitable for the predelivery and acceptance inspections unless disapproved by the Participating Public Agency. The Participating Public Agency reserves the right to perform any of the inspections and tests set forth in the specification where such inspections are deemed necessary to assure supplies and service conform to the specification and contract. The contractor shall provide the Participating Public Agency's inspection representatives with the manufacturers readily available instruments and all such assistance as they may find necessary.

4.1.1 PARTICIPATING PUBLIC AGENCY VERIFICATION

Quality assurance operations performed by the contractor will be subject to Participating Public Agency verification at unscheduled intervals. Verification will consist of observation of the operations to determine that practices, methods, and procedures of the contractor's inspection are being properly applied. Failure of the contractor to promptly correct observed deficiencies shall be cause for suspension of acceptance of the ambulance(s) until conformance to specification criteria has been demonstrated.

4.2.1 QUALITY CONFORMANCE INSPECTION

Quality conformance inspection applies to all ambulance(s) offered for acceptance under the contract. Quality conformance inspection shall consist of:

1. Workmanship inspection
2. Operational checks
3. Examination of the ambulance handbook
4. Verification of successful completion of AMD tests 001 and 003-026 and the annex.

4.2.2 OPERATION CHECKS
Operational checks of the ambulance shall cover all controls, electrical systems, and devices, doors, windows, cabinets, accessories, in and outside the ambulance. Ambulance shall be driven at highway speeds, turns made at minimum radii, brakes tested for dependability, checked for rattles and squeaks. All controls and mechanisms shall function and operate as intended at the time of delivery.

4.2.3 INSPECTION FAILURE OF AMBULANCE(S)
Failure of a production ambulance to have the certifications required or successfully complete the examinations and tests shall be cause for non-acceptance of any of the contract quantity, until deficiencies and evidence of the corrective action preclude recurrence of similar deficiencies. Failure of the ambulance to successfully complete inspection shall not constitute an excusable delay in meeting scheduled deliveries.

4.3 "STAR OF LIFE" CERTIFICATION REQUIREMENTS

4.3.1 QUALIFYING PROVISIONS
The manufacturer/contractor is obligated to certify to the Participating Public Agencys that the ambulance bearing the "Star of Life," its components, and equipment meet or exceed all the requirements and tests set forth in this specification. The certification and "Star of Life" label (Figure 1), verify that the ambulance conforms to this specification on the date of manufacture. Compliance for a "Star of Life" label is defined as certification backed by confirmed verifications of inspections and tests. The verifications shall be in possession of the issuer and presented if and when challenged. For the benefit of Participating Public Agency's procuring activity evaluation and review, prior to or with each proposed bid (solicitation), the bidder/contractor shall provide and forward representative material of their "Star of Life" ambulance(s). This material shall include: a letter certified by a company officer, stating that the delivered ambulance(s) shall comply with paragraphs 4.3.2 thru 4.3.6. Failure to provide certification, at the time the vehicle is presented for inspection, will deem the vehicle unacceptable and shall constitute grounds for termination in accordance with the terms of the contract. Also included shall be: general specification data, exterior and interior pictures, dimensional drawings/data, etc., and other information as requested.

4.3.2 DOCUMENTATION OF "STAR OF LIFE" CERTIFICATION
The ambulance manufacturer shall compile complete certified documentation of verifications for all the tests required under 4.4 conforming to 4.3.4 and 4.3.6 for each Type of ambulance intended to be marketed to the Emergency Medical Care industry as a "Star of Life" ambulance.

4.3.3 CRITERIA OF CERTIFICATIONS
The initial testing and inspections required for certification shall be performed by:

1. A nationally recognized testing laboratory, recognized by OSHA under Appendix A to 29 CFR 1910.7

   Or

2. An ISO/IEC 17025 accredited laboratory by an accreditation body that is recognized by the National Cooperation for Laboratory Accreditation (NACLA) or is a signatory to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). The scope of accreditation shall include AMD tests 001 and 003-026 and the annex.

The individual certifications will remain valid for 5 years as long as the type of ambulance tested remains in production. Design changes during the 5 year certification period must be tested at the time of production release.

Certifications that appear on the ambulance need not be re-submitted. Certification(s) will be acceptable in lieu of actual verification test during inspections providing supporting verifying data complying with 4.3.3 is on file for examination.

Certification from OEM and individual equipment manufacturers are acceptable providing they are not part of a system(s) or altered an in accordance with 4.3.4.

Type certifications of individual components and equipment products are acceptable.

Each ambulance constructed shall be tested by the FSAM to demonstrate compliance with AMD STDs 5, 9, 10, 15, 21, 25 & 29 and the annex. This is in addition to the initial type testing certification required.

4.3.4 CERTIFICATION LETTER FORMAT

Certification letters submitted for the ambulance model, components, and equipment being certified shall contain the following information on contractor's letterhead stationery in electronic format (pdf files):

1. To whom certifying
2. Date
3. Units or items,
4. Manufacturer and address,
5. Date product tested,
6. Model number and specification data,
7. Applicable specification references and test requirement,
8. Summary of the test report
9. A certifying statement w/ official signature.

4.3.5 CERTIFICATION VERIFICATION DATA REPORTS

The testing facility for each certification shall supply supportive verification data and information on letterhead stationery in electronic format (pdf files):

1. For whom tested,
2. Report date,
3. Name of sample product or device,
4. Manufacturer's address,
5. Serial and model number(s),
6. Specification referral and amendment number(s), and test requirement(s),
7. Test facilities used and location,
8. Test equipment used,
9. Test procedure,
10. Test results,
11. Verifying test data,
12. Photographs,
13. Test conclusion(s)
14. Witness(es), and authorized signature

4.4 TESTS.

4.4.1 TEST CRITERIA.

The ambulance shall be prepared for operation in accordance with OEM's recommendations, and AMD Standards 001 and 003--026. The ambulance shall successfully complete all parts of the quality conformance inspection.

5. PREPARATION FOR DELIVERY

5.1 PREPARATION
The ambulance(s) shall be preserved and packaged for mobile delivery in accordance with the contractor's standard commercial practice, insuring carrier acceptance and safe delivery to destination in compliance with regulations applicable to the mode of transportation.

5.2 PARTICIPATING PUBLIC AGENCY RESPONSIBILITY

The contractor shall deliver the vehicle to the consignee delivery address designated on the motor vehicle delivery/purchase order.

The Participating Public Agency is responsible for:

1. Notifying the contractor of the delayed delivery date and the in-transit mileage accumulation as applicable.

2. In the presence of the delivering driver, immediately inspecting the vehicle for damage, abuse, loss or theft that may have occurred during transit. Any such findings should be accurately described on the delivery receipt the driver presents for signature. If the vehicle(s) are covered with snow, Ice or dirt so as to prevent a complete inspection at the time of delivery, this is to be noted on the delivery receipt. The driver is required to acknowledge any notification on the delivery receipt by signature.

3. Notifying the contractor of any damages or shortages found within 24 hours.

4. Obtaining local safety and emission testing that may be required.

5. Obtaining the title and license plates that may be required.

6. Retuning the warranty registration card(s) to the contractor. The contractor's warranty does not go in effect until the ambulance is registered with the contractor by the Participating Public Agency.

6. Notes

6.1 PRECAUTIONS AND OBSERVATIONS
Participating Public Agencies should read the entire document before requisitioning an ambulance, in order to be knowledgeable of just what equipment is standard, and which options need to be exercised. Due to the variety of ambulance equipment or features, some options may be incompatible with the model desired (reference chassis and ambulance manufacturer's data books).

6.2 WARRANTY

6.4.1 WARRANTY COVERAGE

The contractor shall warrant the ambulance and furnished equipment against parts failure or malfunction due to design, construction, or installation errors, defective workmanship, and missing or incorrect parts for a minimum period of 12 months or 12,000 miles (which ever occurs first) for domestic use, and 15 months or 12,000 miles (which ever occurs first) for foreign use from date of acceptance*, exclusive of any authorized accumulated driveway mileage.

However, if the contractor received from any supplier or subcontractor additional warranty on the whole or any component of the ambulance, in the form of time and/or mileage, including any prorate arrangements, or the contractor generally extends to their commercial customers a greater or extended warranty coverage, the Participating Public Agency shall receive corresponding warranty benefits.

*The warranty begins when the Participating Public Agency accepts the ambulance from the contractor FOB point of destination.

The warranty shall include furnishing, without cost to the Participating Public Agency (FOB contractor's nearest dealer or branch to vehicle's location or station), new parts and assemblies to replace any that failed or malfunctioned within the warranty period. In addition, when the Participating Public Agency elects to have the work performed at the contractor's plant, branch, or dealer, or with the contractor's approval (i) to correct the vehicle itself or (ii) to have the vehicle corrected by a commercial garage facility, the cost of the labor involved in the replacement of the failed or malfunctioned parts or assemblies shall be borne by the contractor.

6.4.4 WARRANTY EXCLUSIONS

The following items are considered normal maintenance and repair for which the contractor need not assume liability for reimbursing the Participating Public Agency regardless of the ambulance age or mileage:

1. Abuse, negligence, or un-approved alteration of original parts;
2. Damage from accidents;
3. Standard brake and clutch adjustments;
4. General tightening, headlamp adjustments;
5. Wheel alignment or tire balancing;
6. Tires, batteries, medical supplies and equipment, and radio(s) (if warranted by their manufacturers;
7. Miscellaneous expense such as fuel, towing, telephone, travel, lodging, or loss of personal property.

6.5 REPAIR PARTS AND SERVICE

As continuous operation of the ambulance described by this specification is of utmost importance for the successful bidder to be in a position to render prompt service and to furnish replacement parts. Accordingly, bidders shall indicate the extent of their ability to render prompt service by furnishing a list of branch offices or agencies where complete stocks of repair parts are maintained and can be secured within a reasonable time after ordering by part number from the manufacturer's part book and at such discount as may be quoted from year to year by the manufacturer of the ambulance purchased under this specification.

6.6 STATEMENT OF ORIGIN OR BILL OF SALE.

A manufacturer's Statement of Origin or Bill of Sale for each vehicle procured shall be provided to the Participating Public Agency. The front of the document shall show the applicable RPN number shown on the Motor Vehicle Delivery Order. Non-OEM re-sellers must re-assign the document to the purchasing agency listed in the Consignee Mailing Address shown on the Motor Vehicle Delivery Order. The document shall be forwarded to the Consignee Mailing Address shown on the Motor Vehicle Delivery Order prior to shipment. Vehicle title/registration and safety/emission tests are the responsibility of the requisitioning agency.

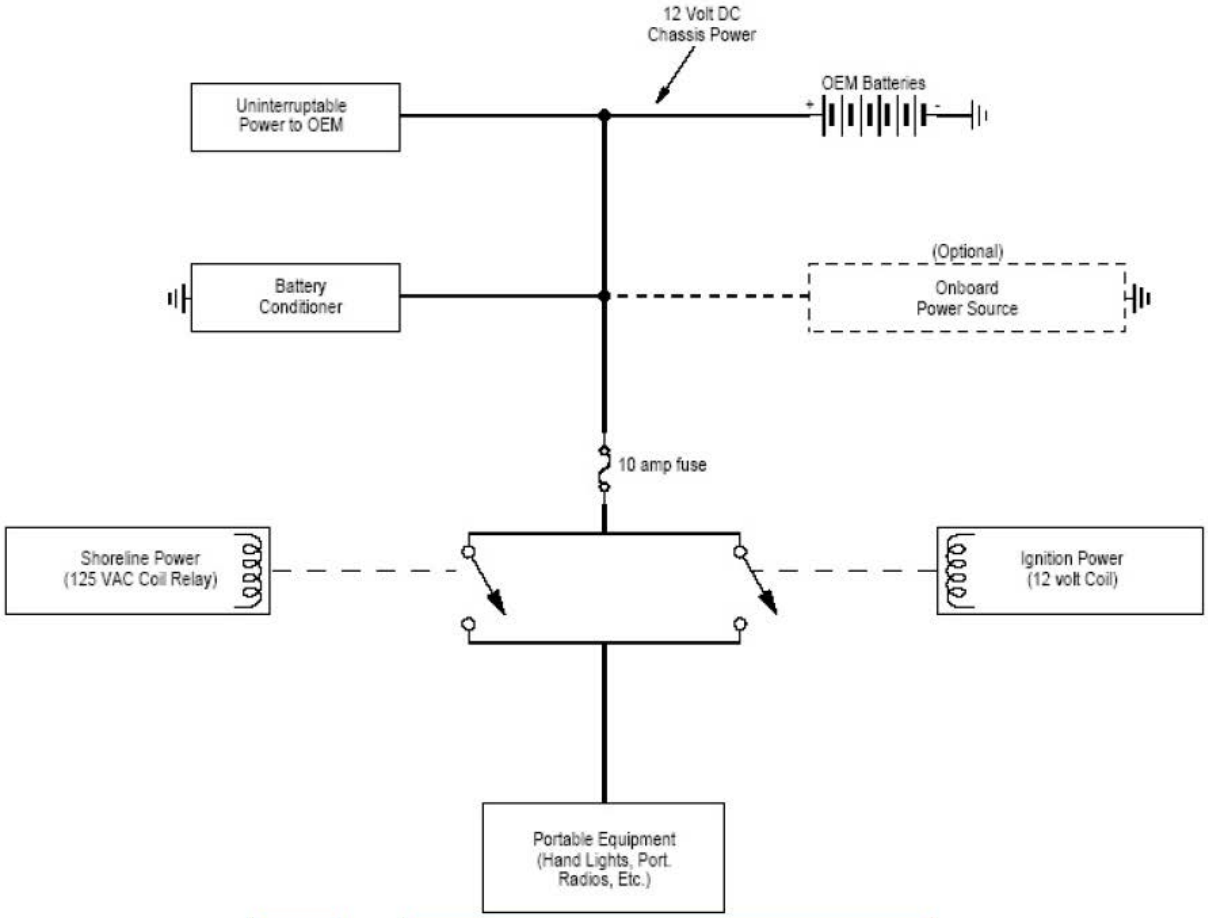


Figure 4 125 Volt AC Utility Power System - Functional Diagram

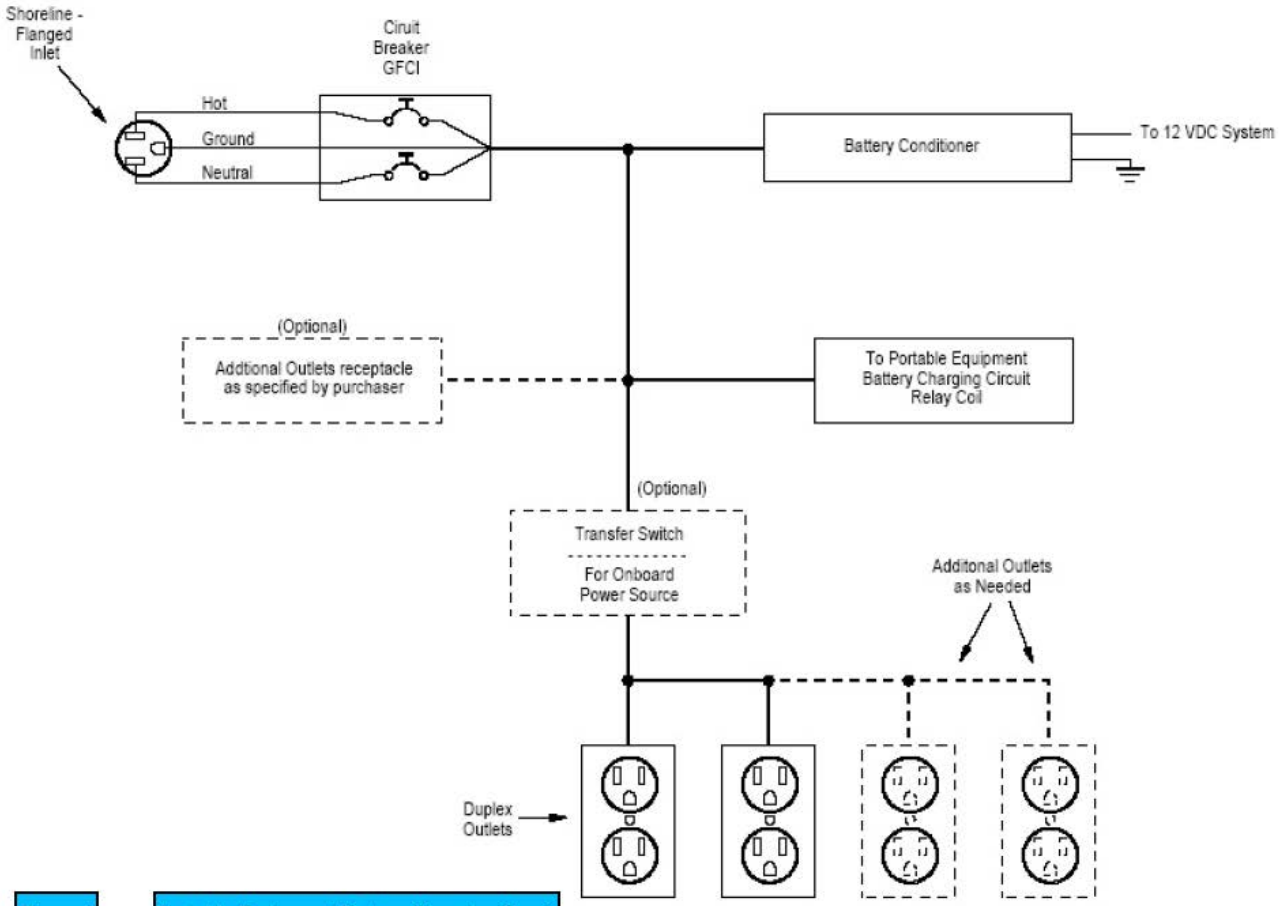


Figure 5 Portable Equipment Battery Charging Circuit

Maximum Functional Reach Maximum functional reach is measured from the center point of the junction of the seat pan and seat back to the thumb tip where the arm is fully extended parallel to the floor and the torso is leaning forward at a 45° angle. Maximum functional reach is calculated using the following formula, where F = functional reach and S = seat to shoulder sitting height.

$$\textit{Maximum functional reach (MFR)} = \sqrt{F^2 + \frac{2FS}{\sqrt{2}} + S^2}$$

As an example using anthropometric data from MIL-STD-1472G, the maximum functional reach for a 5th percentile female, illustrated below is calculated using the seat (bottom of buttocks) to shoulder torso length (20.0 inches [508 mm]) leaned forward at a 45° degree angle and a functional reach as measured from the shoulder blade to thumbtip (26.7 inches [677 mm]) for a maximum functional reach of 43.2 inches (1097 mm).

$$MFR = \sqrt{26.7^2 + \frac{2(26.7)(20)}{1.41} + 20^2} = 43.2 \text{ inches}$$

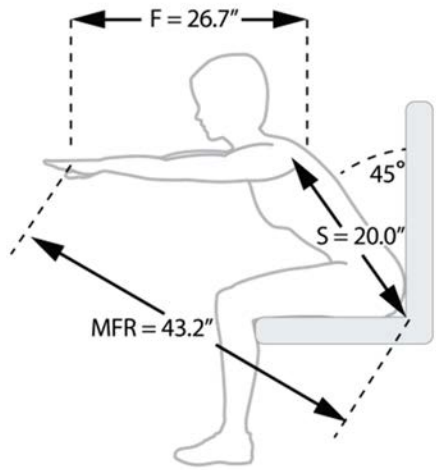


Figure 6 - Maximum Functional Reach for a 5th Percentile Female

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # B-1

CITY OF HOUSTON FIRE DEPARTMENT

ENGINE SPECIFICATION

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) SOLICITATION NO.: S58-T25507
ENGINE SPECIFICATION - ATTACHMENT # B-1

SPEC 740D HFD FY15

CITY OF HOUSTON FIRE DEPARTMENT
ENGINE SPECIFICATIONS

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus for service in the Department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful vendor must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction for all features. The National Fire Protection Association Standard 1901, current edition, unless otherwise specified in these specifications, shall prevail.

Proposals shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of twenty-five years.

Each vendor shall provide satisfactory evidence of their ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. They shall also show that they are in a position to render prompt service and to provide replacement parts for said apparatus.

Because of the severe service requirements the department will impose on this apparatus, each vendor shall provide a list of at least six (6) departments serving populations of over 250,000 in which similar apparatus utilizing the brand of chassis proposed have been in service for over one year. This list shall include contact names and phone numbers.

Each proposal shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus being provided under this contract which conform.

Contractor's Specifications Note: Each vendor shall submit their quote in the same sequence as these specifications to allow the department to easily compare multiple quotes.

QUALITY AND WORKMANSHIP

The design of the Apparatus must embody the latest approved automotive engineering practices.

The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points: Occupant Protection System (OPS), accessibility of the various units that require periodic maintenance operations, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off road requirements and to speed conditions as set forth under "Performance tests and requirements".

Welding shall be employed in the assembly of the apparatus in a manner that will not prevent the ready removal of any component part for service or repair.

DELIVERY

To insure proper break-in of all components while still under warranty, the apparatus shall be delivered under its own power. A qualified delivery engineer representing the contractor shall instruct the Fire Department Personnel in the proper operation, performance, care and maintenance of the equipment delivered. The unit will remain insured by the apparatus manufacturer until the department accepts it.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more will be made, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful vendor shall provide a Weight Certificate showing weights on front axle, rear axles and total weight for the completed apparatus at time of delivery.

A. The apparatus shall be capable of accelerating to 35 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.

B. From a steady space of 15 MPH the vehicle shall accelerate to 35 MPH within 30 seconds. This shall be accomplished without moving the gear selector.

C. The service brakes shall be capable of stopping the fully loaded vehicle in 35 feet at 20 MPH on level dry concrete highway.

D. The apparatus, fully loaded, shall be capable of obtaining a minimum speed of 50 MPH on a level dry concrete highway with the engine not exceeding its governed RPM (fully loaded).

E. The apparatus shall be tested and approved by the Underwriter's Laboratories Incorporated in accordance with their standard practices for pumping engines.

F. The contractor shall provide copies of the Pump Manufacturer's Certification of hydrostatic test, the Engine Manufacturer current certified brake horsepower curve, and the Manufacturer's record of pumper construction details when delivered.

The vendor, at their expense, shall have the Underwriter's Laboratories Incorporated conduct the tests required by the Underwriter Laboratories Incorporated (Guide for the Certification of Fire Department Pumper subject 822 dated 1995 or latest). A copy of all tests shall accompany the Apparatus.

The contractor shall supply the final manufacturer's certification of GVWR and GAWR on a nameplate affixed to the vehicle.

A permanent plate shall be mounted in the driver's compartment to specify the quantity and type of the following fluids used in the vehicle: Engine oil, engine coolant, and chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used) and drive axle lubrication fluid.

A permanent plate in the driver's compartment shall be installed, specifying the seating capacity of the enclosed cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" shall be provided and will be visible from each seated position. An accident prevention sign

shall be located at the rear step area of the apparatus. It shall warn all personnel that standing on the step while apparatus is in motion shall be prohibited.

A nameplate indicating the chassis transmission shift selector position to be used when pumping shall be provided in the driving compartment and located so that it can be easily read from the driver's position.

LIABILITY

The vendor, if their proposal is accepted, shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of NFPA 1901.

The apparatus shall be designed so that the operator could perform all recommended daily maintenance checks easily without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These components must not be welded or otherwise permanently secured into place.

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, the specified hose load, unequipped personnel weight, ground ladders and a miscellaneous equipment allowance per NFPA criteria. It shall be the responsibility of the purchaser to provide the contractor with the weight of equipment to be carried if it is in excess of the allowance as set forth by NFPA.

The unequipped personnel weight shall be calculated at 250 lbs. per person times the maximum number of persons to ride on the apparatus.

The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 7 percent.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Where special tools manufactured or designed by the contractor and are required to provide routine service on any component of the apparatus built or supplied by the contractor, such tools shall be provided with the apparatus.

PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all proposals as it deems to be of their best interest to do so.

EXCEPTIONS TO SPECIFICATIONS

The following Chassis, Pump and Body specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page entitled "Exceptions to Specifications". The exception list shall refer to specification page number and paragraph. Proposals taking total exception to specifications or total exception to certain parts of the specifications such as Electrical Systems, Body or Pump, will not be accepted. Apparatus shall be inspected during construction and upon apparatus completion for compliance with specifications. Deviations will not be tolerated and will be cause for rejection of Apparatus unless they were originally listed in the vendor's proposal and accepted in writing by the department.

If the vendor takes an exception, on the exception page, the vendor must state an option price to bring their specifications into full compliance with the Department specifications. Failure to provide this information shall be cause to reject the proposal as being non-responsive.

PROPOSAL DRAWINGS

For purposes of evaluation, the vendor shall provide a drawing illustrating, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus and other specified equipment, shall be required to be included with the vendor's proposal package.

The drawings shall be large "D" size (minimum 24" x 36"). Smaller size drawings, "similar to" drawings or general sales drawings, shall not be acceptable. Failure to provide a proposal evaluation drawing in accordance with these specifications shall be cause for rejection of the proposal.

APPROVAL/PRE-CON DRAWINGS

After the award of the proposal, the vendor shall provide detailed colored engineering drawings including, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus for use of pre-construction conference. The drawings shall include, but shall not be limited to the right, left, top, front and rear views of the apparatus**.**

In addition, a detailed engineering drawing of the pump operator's panel will be provided following the preconstruction meeting.

The Customer will sign the final approval drawings.

CONSTRUCTION SPECIFICATIONS & DRAWINGS

Electronic copy (PDF) of Specification & Engineered Drawings sent to HFD rep 30 days before start of construction on chassis (MI) and 30 days before start of construction on body (SD).

DASH/HEADER LAYOUT DRAWING- Electronic copy (PDF) of dash & header layout to be approved by HFD rep 30 days before start of construction on chassis (MI).

SINGLE SOURCE MANUFACTURER

Proposals shall only be accepted from a single source apparatus manufacturer. The definition of single source manufacturer is company that designs and manufactures their products utilizing an approach that includes complete product integration, including the apparatus chassis, cab and body modules being constructed, assembled, and tested on company premises only.

Warranties qualified to the chassis and body design construction (excluding vender component warranties such as engine, axles, transmission, and pumps, etc.) will be from a single source manufacturer and not separated between manufacturers (i.e. body and chassis). The vendor shall provide evidence of maintaining compliance to this requirement.

FINITE ELEMENT ANALYSIS AND TESTING

Finite Element Analysis has been utilized in evaluating and engineering the critical areas of the apparatus body. Prototype bodies have been subjected to rigorous testing over varied terrains simulating different environmental conditions. The purpose of such complex engineering methods of analysis shall be to ensure the longevity of the design by analyzing stress levels throughout the body and incorporating the structural supports wherever necessary.

There shall be a minimum of 3 different load cases (per DOT, FHWA, and TTMA recommended practice) applied and analyzed to properly display the different areas and levels of stresses that will be present under the various operating conditions of the apparatus. This is in addition to the static stress analysis. The analysis shall have included the weight of the structure plus an estimate of all the components that exist on a fully loaded apparatus (i.e. Tank, water, hose load, equipment in compartments, etc.).

Analysis shall also have been conducted on the mounting system for the apparatus body and pump house. Detailed colored drawings shall be supplied with the vendor's proposal.

SUPPLIED INFORMATION & EXTRAS

The apparatus manufacturer shall supply two (2) copies (at least one to be digital) of apparatus manuals with all manufactured apparatus. The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacturer can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, the manufacturer shall also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other recommendations for care and upkeep of the general apparatus.

The manufacturer shall also supply a manufacturer's record of apparatus construction details, including the following information:
Owner name and address;
Apparatus manufacturer, model, and serial number;
Chassis make, model, and serial number;
GAWR of front and rear axles;
Front tire size and total rated capacity in pounds;
Rear tire size and total rated capacity in pounds;
Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear)

Engine make, model, serial number, rated horsepower, related speed and no load governed speed;
Type of fuel and fuel tank capacity;
Electrical system voltage and alternator output in amps;
Battery make and model, capacity in CCA:
Paint numbers;
Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full but without personnel, equipment, and hose):
Written load analysis and results of the electrical system performance tests;
Transmission make, model, and type;
Pump to drive through the transmission (yes or no);
Engine to pump gear ratio and transmission gear ratio used;
Pump make, model, rated capacity in gallons per minute, serial number, and number of stages;
Pump manufacturer's certification of suction capability;
Pump manufacturer's certification of hydrostatic test;
Pump manufacturer's certification of inspection and test for the fire pump;
Copy of the apparatus manufacturer's approval for stationary pumping applications;
Pump transmission make, model and serial number;
Priming device type;
Type of pump pressure control system;
The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed;
Certification of water tank capacity;

GENERAL WARRANTY

A warranty shall be offered for each new fire apparatus manufactured for a period of Two (2) years from the date of delivery, except for the commercial chassis and certain other components as noted in the next paragraph.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities.

STRUCTURAL WARRANTY

A structural warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

PAINT WARRANTY

A ten (10) year Prorated Paint Warranty shall be included with the apparatus.

PLUMBING WARRANTY

A Stainless Steel Plumbing/Piping warranty shall be offered for each new fire apparatus manufactured for a period of ten (10) years from the date of delivery.

TANK WARRANTY

A lifetime tank warranty will be provided by the tank manufacturer.

MULTI-PLEXED ELECTRICAL WARRANTY

If equipped, A four (4) year limited multiplex system warranty shall be provided by the apparatus manufacture for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation.

APPARATUS TEST BY UNDERWRITERS LABORATORIES

The following Apparatus shall comply with all NFPA 1901 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by the contractor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall furnish the completed Test Certificate to the purchaser at time of delivery.

Since the inspection services of Underwriters Laboratories are available to all vendors on an equal basis, no other third party testing service shall be acceptable.

The tests conducted on the apparatus shall include, but not be limited to:

PUMP & PLUMBING PERFORMANCE TEST
The apparatus pump and plumbing system shall be tested and certified.

12 VOLT ELECTRICAL TESTS
The apparatus low voltage electrical system shall be tested and certified.

The manufacturer will provide three weeks prior notice to the tests being conducted.

FACTORY PRECONSTRUCTION CONFERENCE

The factory authorized Distributor shall be required, prior to manufacturing, to have a preconstruction conference at the manufacturing facility with a factory representative present and individuals from the Houston Fire Department to finalize all construction details.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

MID-CONSTRUCTION INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a mid-construction conference at the site of the manufacturing facility with at least 3 individuals from the Houston Fire Department to inspect the apparatus during construction. The "Purchaser" shall designate the stage of construction at which the visit will be conducted.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

FINAL INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a final completion

inspection conference at the site of the manufacturing facility with at least 3 individuals from the Houston Fire Department to inspect the apparatus after construction.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

ON-LINE CUSTOMER INTERACTION

The manufacturer shall provide the capability for online access through the manufacture's website. The customer shall be able to view digital photos of their apparatus in the specified phases of construction. The following phases will be captured and displayed on the manufacture's website:

1. Chassis- Front, Left, Right, Driver & Officer & Crew areas
1. Body – Prior to Paint – Left, Right, Rear, Top
2. Body – Painted –Left, Right, Rear, Top
3. Pump and Plumbing
4. Assembly – 80% Complete- Left, Right, Rear, Top
5. Any view reasonably requested by the HFD

Due to the complex nature of fire apparatus and the importance of communication between the manufacture and customer, this line item is considered a critical requirement. NO EXCEPTION

PUMP WARRANTY

Hale Products, Inc. shall provide a limited manufacturer's pump warranty to be free from defects in material and workmanship, under normal use and service, for a period of two (2) years parts and labor and parts only for years three (3) through five (5), from the date placed into service.

MAXIMUM OVERALL WIDTH

The apparatus specified shall be constructed as detailed and may exceed a Maximum Overall Width of One Hundred (100") inches, or be less than Ninety-Nine (99″) inches.

This dimension shall include the primary construction of the apparatus body and chassis cab. Any peripherals that are 'removable' shall not be incorporated into this measurement.

Items that are considered 'removable' are: Rub Rails, Fenderettes, Mirrors, Lights, Handrails, Front Bumpers, Etc.

MAXIMUM WHEEL BASE REQUIREMENT

The apparatus specified shall be constructed as detailed and may exceed a wheel base of 193 inches.

MAXIMUM OVERALL LENGTH REQUIREMENT

The apparatus specified shall be constructed as detailed and may exceed a overall length of 33 feet.

MAXIMUM OVERALL HEIGHT REQUIREMENT

The apparatus specified shall be constructed as detailed and may exceed a overall height of 9 feet 9 inches.

HIGH WATER PERFORMANCE REQUIREMENT

The Apparatus specified shall meet or exceed the following performance requirements while operating in 40" of water. In order to achieve this requirement, all vents and other openings in construction or mechanical/electrical components shall be mounted above the 40" mark and must be sealed.

VEHICLE STABILITY (CG) CALCULATION OR MEASUREMENT CERTIFICATION

Vehicle stability or roll stability shall be presented by methods of calculations or measurements per NFPA 1901 – current edition. The calculated or measured center of gravity (CG) shall be no higher than 80 percent of the rear axle track width.

The OEM shall utilize supplied documents and information detailing specific equipment and locations for purposes of calculating CG. If no such information is supplied the OEM shall estimate approximate equipment loads based upon the vehicle configuration for such calculations in correspondence with NFPA 1901 required loadings.

Upon acceptance of the vehicle, a signed OEM written certification shall be supplied with the fire apparatus before delivery.

MODEL

The chassis shall be the manufacturer's Extended Four-Door cab model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2016 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis.

APPARATUS TYPE

The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 2000 gallons per minute. The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the mid-ship location.

CAB STYLE

The cab shall be a custom, fully enclosed, extended four door cab model with a raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer multiple seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for cab construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of metal.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. Deviations must be approved by the HFD.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface. Deviations must be approved by the HFD.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

OCCUPANT PROTECTION

The vehicle shall include Occupant Protection System (OPS) which shall secure belted occupants and increase the survivable space within the cab. Occupant Protection System (OPS) shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the OPS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver knee air bags and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- OPS seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck restraint control electronics - receives inputs from the outboard sensors, selectively deploys OPS systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the restraint control electronics.
- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the restraint control electronics. In a qualifying front impact event the outboard sensors provide inputs to the restraint

control electronics. The restraint control electronics activate the steering wheel airbag, driver side knee airbags, officer side knee airbag, and advanced seat belts for each occupant in the cab.

The OPS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95th percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the restraint control electronics. In qualifying rollover or side impact events the outboard sensors provide inputs to the restraint control electronics. The restraint control electronics activates the side curtain airbags and advanced seat belts for each occupant in the cab. The restraint control electronics measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the restraint control electronics shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The OPS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front cab fascia shall include a classic box style grill with deviations approved by the HFD. The grille shall include a minimum free air intake that meets the minimum requirements of the engine manufacturer. If available, the grille will include a unit designation, i.e., “83”.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint or alternative approved by the HFD.

CAB PAINT PRIMARY/LOWER COLOR

The paint color shall be PPG FBCH 926236 red or closest matching equivalent.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with dark red non or low gloss spray on bed liner product which shall mold to each surface of the cab interior. The liner shall be environmentally friendly and chemically resistant.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum. The exterior skins shall be constructed of aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style pin and shall be constructed of stainless steel with appropriate corrosion protection.

CAB ENTRY DOOR TYPE

All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide clearance from the ground to the bottom of the door so cab doors may be opened un-hindered by most obstacles encountered, such as guard rails along interstate highways.

CAB INSULATION

The cab ceiling and walls shall include foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH INTERIOR MID COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment/tool mount located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the left side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

RH INTERIOR MID COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the right side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

CAB STRUCTURAL WARRANTY

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon-style brand of multiplexing system or equivalent, suppressed per SAE J551. The 12V system breaker and relay panel shall be located as close to the windshield as possible. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed connectors shall be waterproof.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a current LCD-style style display which shall be located on the left side of the dash in the switch panel. The LCD-style display shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall virtual controls, for the on-board diagnostics. The display screen shall be video ready for back-up cameras, thermal cameras, and DVD if determined to be needed by the HFD.

The LCD-style display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

All warranties will be listed on the LCD-style screen. Individual manufacturer deviations of these items can be pre-approved by the HFD.

DATA RECORDING SYSTEM

The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
  Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud

shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

AUXILIARY ACCESSORY POWER

An auxiliary six (6) positions Blue Sea Systems 5025 blade type or equivalent fuse panel or equivalent shall be installed behind the switch panel. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

ADDITIONAL ACCESSORY POWER

An additional six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed on the side wall of the engine tunnel behind the officer's seat. The fuse panel shall be protected by a 40 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTRA ACCESSORY POWER

An extra six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be provided and coiled loose on the floor at the center of the rear wall of the cab with four (4) feet of additional wiring. The fuse panel shall be protected by a 60 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 60 amp battery direct load. Final mounting in this area to be determined by the HFD.

ANCILLARY ACCESSORY POWER

One (1) ancillary six (6) position Blue Sea Systems 5025 blade type fuse panel or equivalent shall be installed behind the officer’s seat. The fuse panel shall be protected by a 100 amp fuse located at the batteries. The fuse panel shall be capable of carrying up to a maximum 100 amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ENGINE

The chassis engine shall be a Cummins ISL9 engine. The ISL9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The ISL9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of aluminum plate.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the LCD-style display and control screen for the high idle speed control.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

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

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle’s brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

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

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.

- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

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

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The engine oil, coolant, transmission, and power steering fluid fills shall be located under the cab. The windshield washer fill shall be accessible through the front left side mid step or a reasonably convenient location.

ENGINE DRAIN PLUG

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

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

REMOTE THROTTLE CONTROL

A Fire Research In Control 400 pressure sensor governor or reasonably equivalent alternative shall be provided for the electronic engine. It shall include a remote mountable control head.

The In Control shall regulate the pump pressure and monitor all essential engine parameters.

LED readouts shall display RPM, PSI, pump discharge and intake pressure, engine oil pressure, engine temperature, transmission temperature and battery voltage. An audible alarm output shall also be part of the system.

The rpm increase and decrease will be controlled by control knob on the face of the In Control 400.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The harness shall contain connectors for a Fire Research In Control 300/400 pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall be designed for a side mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall be direct drive belt driven on the engine.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall utilize a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, an air to air charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injection molded polymer eleven (11) blade fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer’s requirements.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris.

ENGINE COOLANT

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

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

COOLANT HOSES

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE AIR INTAKE FILTER AND RESTRICTION W/REPLACEABLE ELEMENT

The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the right hand side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the right hand side. The system shall utilize a replaceable dry type filter which ensures dust and debris remains safely contained inside the housing during operation via leak-tight seals. The service cover shall be located on the bottom of the housing, eliminating the chance of contaminating the air intake system during air filter service.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter element, which shall result in pressure differential for improved horsepower and fuel economy. The air intake ember separator shall be mounted within easy access via a hinged panel behind the right hand side headlight module. The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system if mounted low enough to require one. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris.

ENGINE EXHAUST SYSTEM

The exhaust system shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF. The exhaust system shall utilize a 90-degree bend in the exhaust tubing from the turbo into a side inlet DPF canister that allows the entire system to be pulled forward. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a minimum capacity of five (5) usable gallons and shall be mounted on

the left hand side of the chassis frame behind the batteries below the frame unless another suitable location is required.

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

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible without raising the cab.

ENGINE EXHAUST ACCESSORIES

The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

ENGINE EXHAUST WRAP

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

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
Rev	5.03:1

TRANSMISSION MODE PROGRAMMING

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

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational packages in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	Description	Wire assignment
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

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

TRANSMISSION COOLING SYSTEM

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

TRANSMISSION DRAIN PLUG

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

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat® or equivalent.

MIDSHIP PUMP / GEARBOX

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

MIDSHIP PUMP / GEARBOX MODEL

The mid-ship pump/gearbox provisions shall be for a Hale QMAX pump.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor 690R1210 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

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

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

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel. Fuel valve locations shall be clearly visible and not buried in wire bundles or the like under the cab.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL COOLER

Aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

FUEL TANK

The fuel tank shall have a minimum capacity of approx. sixty (60) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw. The vent shall include a three (3) feet long vent hose to allow for the vent to be mounted so the end of the vent line is at least forty (40) inches from the ground. The final routing of the vent hose shall be determined by the OEM.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right and left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

A hole shall be provided in the left and right frame rails for vent hose routing provisions. The holes shall be located adjacent to the fuel tank from the bottom of each rail.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL FILL LOCATIONS

Fuel fill locations will be located on the right and left sides of the body for easy fueling at a retail fuel facility.

FRONT AXLE

The front axle shall include an independent front suspension (IFS) offering superior ride and improved handling.

The suspension shall utilize fully independent double wishbone arms with carrier and kingpin for optimized scrub radius. Air springs are tuned for ride and help reduce suspension weight. The IFS

reduces turn radius with improved wheel cut over beam axles. The hydraulic damper shall feature rebound control to ensure the maximum load stability and superior driver comfort. The IFS system shall improve handling and offer better braking because of improved ground to tire ratio. This design shall allow for independent adjustment of the vehicle's alignment settings.

Proposals offering independent front axles comprised of torsion bar style suspensions shall not be considered.

FRONT AXLE WARRANTY

The front axle shall be warranted by the manufacturer or dealer for three (3) years or 150,000 miles, whichever comes first.

FRONT WHEEL BEARING LUBRICATION

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

FRONT SHOCK ABSORBERS

Two (2) Bilstein, or equal, inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system.

The Bilstein or equal front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Alternative IFS systems can be considered by the HFD.

FRONT SUSPENSION

The independent front suspension (IFS) system shall improve handling and offer better braking because of improved ground to tire ratio. Lower spring rates and independent wheel travel shall reduce the shock within the wheel and feedback throughout the axle. Increased roll stiffness reduces chassis lean in cornering. The suspension travel of the IFS shall be approximately 6.50 inches, providing 3.00 inches jounce and 3.50 inches rebound of the suspension. This feature shall offer a smoother ride for personnel and sensitive equipment. The IFS front axle shall be rated between 18,000 and 20,000 pounds.

Proposals offering independent front axles comprised of torsion bar style suspensions shall not be considered.

STEERING COLUMN/ WHEEL

The cab shall include a steering column which shall include a multi-position tilt, telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

POWER STEERING PUMP

The hydraulic power steering pump shall be a Vickers 20V and shall be gear driven from the engine. The pump shall be a fixed displacement vane type. The power steering fluid shall be synthetic ATF Transynd and have a pour point of -67 degrees Fahrenheit (-55ºC).

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

FRONT AXLE CRAMP ANGLE

The chassis shall have a maximum front axle cramp angle of 55-degrees to the left and right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85/RCS 85 or equivalent

CHASSIS ALIGNMENT

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

REAR AXLE

The rear axle shall be a Meritor model RS-23-186 single drive axle or equivalent. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 24,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

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

The rear suspension capacity shall be rated from 21,000 to 31,000 pounds.

FRONT TIRE

The front tires shall be Goodyear 385/65R-22.5 18PR "J" tubeless radial G296 MSA mixed service tread.

The front tire stamped load capacity shall be 18,740 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating load capacity shall be 20,000 pounds per axle with a maximum speed of 68 miles per hour when properly inflated to 120 pounds per square inch. If the maximum speed is 70-75 MPH the tire shall be rated at stamped rating of 18,740 lbs. The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

The rear tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G661 HSA mixed service tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

REAR AXLE RATIO

The rear axle ratio shall be 5.13:1.

TIRE PRESSURE INDICATOR

There shall be a voucher provided with the chassis for a pop up style tire pressure indicator at each tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright®

finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include at least two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a controlled service brake application during the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

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

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

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

FRONT BRAKES

The front brakes shall be Bendix ADB 22X disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

PARK BRAKE

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

PARK BRAKE CONTROL

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

The parking brake actuation valve shall be mounted in the switch panel. A guard shall be installed over the parking brake control to prevent accidental application or release.

AIR DRYER

The brake system shall include a Bendix AD-9 fully self-contained air dryer which shall not require an extra purge tank or additional valves. The AD-9 system shall include a spin-off desiccant filter with a 12-volt, 75-watt thermostatically controlled heating element. The air dryer shall feature 3.9 pounds of premium, high crush strength desiccant which shall be produced with a composition that shall be more effective and longer lasting than other desiccants. It shall also offer protection against contamination and desiccant breakdown. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the independent front suspension axle.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a 2084 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Manual cable actuated drain valves shall be installed on all reservoirs of the air supply system. The actuation pull cables shall be coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with black textile braid covered high tensile steel reinforced wire braided hose with steel reusable fittings. All drop hoses shall be fiber reinforced neoprene covered hose.

AUXILIARY AIR CONNECTION

An auxiliary airline shall be plumbed off the auxiliary air tank and routed inside the cab terminating under the center dash area. A temporary mounted brass single port tee shall be supplied for the OEM usage, such as pump shift operator valves. If used for a pump shift the control shall be provided and installed by the OEM.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted parallel to frame.

WHEELBASE

The chassis wheelbase may exceed 192.50 inches.

REAR OVERHANG

The chassis rear overhang may exceed 48.00 inches.

FRAME

The frame shall consist of double C channel rails running parallel to each other with cross members forming a ladder style frame. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches.

Proposals calculating the frame strength using the “box method” shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

Gusseted cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

FRAME PAINT

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 104.50 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

FRONT BUMPER EXTENSION FRAME WIDTH

The front bumper extension frame shall feature an overall width of approx. 48.25 inches.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER APRON

The 21.00 inch extended front bumper shall include an apron constructed embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep.

MECHANICAL SIREN LOCATION

The siren shall be pedestal mounted on the bumper apron on the inboard section of the bumper on the driver side. The siren shall be mounted far enough rearward as to not extend beyond the face of the bumper but allow clearance to raise the cab. Final location to be approved by the HFD.

AIR HORN

The chassis shall include two (2) air horns which shall be trumpet style with a chrome finish.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

AIR HORN RESERVOIR

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

The bumper shall include two (2) Whelen Engineering Inc. model SA314A~~,~~ 100 watt speakers which shall be recess mounted within the bumper fascia. Each speaker shall measure 6.40 inches tall X 6.17 inches wide X 3.14 inches deep. Each speaker shall have a natural cast aluminum finish and shall be installed using a polished aluminum trim ring.

ELECTRONIC SIREN SPEAKER LOCATION

The two (2) electronic siren speakers shall be located on the front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty chrome plated tow hooks shall be installed below the front bumper, forward position and bolted directly to the outside of each chassis frame rail with grade 8 bolts.

FRONT LICENSE PROVISION

The bumper shall include four (4) mounting holes to allow for a license plate to be installed by the OEM or end user. The mounting holes shall be drilled and tapped for ¼-20 threaded bolts.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the cab tilt pump housing.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT LOCK DOWN INDICATOR

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

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

CAB TILT CONTROL RECEPTACLE

The manufacture shall provide a means to tilt the cab.

CAB WINDSHIELD

The cab windshield shall be of a two (2) piece wraparound design for maximum visibility. Single piece designs can be considered.

The glass utilized for the windshield shall include standard automotive tint.

Each windshield shall be installed using black self-locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window which shall measure approx. 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as “cozy glass” ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver’s control panel.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR LH

The rear left hand side crew door shall include a window. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver’s control panel.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

The cab shall include a minimum 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. The temperature and blower controls shall be located on the heater/air conditioning unit.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-quip EZ clip fittings. Alternative configurations can be considered by he HFD.

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise. Exact location TBD at preconstruction conference.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal 6.00 inch air circulation fans installed on the center section of the ABS HVAC cover rearward of the windshield in line with the center map light. Each fan can be controlled by an individual virtual button on the LCD-style display and control screen or a toggle switch on each fan. The fans shall automatically activate whenever the HVAC is in defrost mode. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort

CAB CIRCULATION FANS MID

The cab shall be provided with two (2) individually switched all metal construction 6.00 inch fans. The fans shall be installed in the crew area just behind the front doors in the inboard positions. Each fan can be controlled by an individual virtual button on the LCD-style display and control screen. The multi-purpose fans can be used for air circulation or to help defog windows.

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments. The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing, reinforced with a woven fiberglass layer. The foil surface acts as protection against

moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test. The cab floor insulation shall measure 0.56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab and the insulation inside the tunnel shall have a removable aluminum overlay installed to protect the insulation and assist in retaining the insulation tight against the engine tunnel surfaces.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of sound absorbing closed cell foam with non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding with an Embossed tread plate that shall wrap 2" horizontal and vertically. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM VINYL

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a customer specified interior paint or protective coating. Bed liner style coatings are recommended.

HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of approx. 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of aluminum. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation.

TRIM LH DASH

The left hand dash shall be constructed of aluminum plate for a perfect fit around the instrument panel. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of metal plate and shall include a glove compartment with a hinged door. The glove compartment size will measure approx. 14.00 inches wide X 6.38 inches high X 5.88 inches deep.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of closed cell foam with non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include two (2) 12 volt cigarette lighter type receptacles in the dash to provide a power source for 12 volt electrical equipment and two (2) 1 amp 5volt USB style receptacles. The receptacles shall be wired battery direct.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of 14 gauge 304 stainless steel with indented perforations. The perforations shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 7 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed embossed aluminum tread plate.

STEP TRIM KICKPLATE

The cab steps shall include a kick plate in the rise of each step. The risers shall be trimmed in 3003-H22 bright aluminum tread-plate.

UNDER CAB ACCESS DOOR

The cab shall include two (2) access doors, one in each of the left and right crew step risers constructed of embossed aluminum tread plate held in place with screws. The under cab access doors shall provide access to the diesel exhaust fluid fill and the battery box area under the cab.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of aluminum plate. The door panels shall include a painted finish.

DOOR TRIM SCUFF PLATE

The trim along the door shall include a stainless steel scuff plate traveling along the door jamb and wrapping around from the interior to the exterior in an effort to prevent the chipping of paint should the seat belt buckle come in contact with the door jamb.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

CAB DOOR TRIM REFLECTIVE

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior of each cab door.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered handles installed inside the cab, one on each “A” post at the left and right door openings.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR TRIM VINYL COLOR

The cab interior vinyl trim surfaces shall be black in color.

INTERIOR TRIM SUN VISOR

The header shall include two (2) 7.00 inches high X 18.00 inches wide impact resistant, transparent acrylic polycarbonate sun visors with a smoke gray tint shall be provided and installed on the header above the driver and officer.

The see thru visors are designed for maximum flexibility of positioning utilizing an arm with virtually unlimited adjustability with 13.50 inch long lateral travel of the tinted visor at the end of the arm which can be locked in place by a thumbscrew.

The visors are easily adjusted and can be placed into a chosen position with one hand. The sun visors will help protect vehicle occupants from solar glare without obscuring their vision.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

CAB PAINT INTERIOR

The inner door panel surfaces shall be coated with bed-liner dark red pebble-grain texture finish.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with dark red bed-liner material.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with dark flat red bed-liner. Any accessory pods attached to the dash shall also be coated with this material.

TRIM LEFT HAND DASH INTERIOR PAINT

The left hand dash shall be coated with dark flat red bed-liner.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be coated with dark flat red bed-liner.

REAR WALL INTERIOR PAINT

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a protective coating of dark red bed-liner.

DASH PANEL GROUP

The main center dash area shall include three (3) aluminum removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The panels shall be coated with a black texture finish. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include no rocker switches or legends. (Emergency lights switched in LCD style display)

SWITCHES LEFT PANEL

The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel and one (1) rocker switch located in the left hand side of the panel.

A rocker switch with a blank legend installed directly above shall be provided for this position if not designated by a specific option. The non-designated switch shall be a two-position, black switch with a green indicator light. The blank switch legend can be custom engraved by the body manufacturer. The switch legend shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include one (1) rocker switch position in the left hand portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switch shall be a two-position,

black switch with a green indicator light. The blank switch legend can be custom engraved by the body manufacturer. The switch legend shall have red backlighting provided.

SEAT BELT WARNING

A seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the LCD-style display and control screen(s) and a fast tone audible alarm. The wiring connections at each seat shall have heat shrink tubing applied so that the wiring cannot be easily disconnected to disable the system.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened. The sensors shall be located such that false alarms are minimized.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear 1800.

SEAT COLOR

All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat backs shall include the logo for the Houston Fire Department of Houston, Texas. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Passenger Safety System. The OPS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the OPS shall also provide ejection mitigation protection. The driver's seating area OPS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat back shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer's seat shall offer a special mounting position which is 2.00 inches rearward of the standard location offering increased leg room for the occupant.

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with a Passenger Safety System. The OPS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the OPS shall also provide ejection mitigation protection. The officer's seating area OPS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

- Knee airbag - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT FORWARD FACING OUTER LOCATION

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

SEAT CREW FORWARD FACING OUTER

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat back and cushion. The bottom cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted inboard from the side wall for additional clearance facing the front of the cab.

OCCUPANT PROTECTION FFO

The forward facing outer seat position(s) shall be equipped with a Passenger Safety System. The OPS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the OPS shall also provide ejection mitigation protection. Each forward facing outer seating position OPS shall include:

- advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include one (1) forward facing center crew seat located directly behind the engine tunnel in the center of the cab.

SEAT CREW FORWARD FACING CENTER

The crew area shall include a seat in the forward facing center position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Motor Vehicle Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th

percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

OCCUPANT PROTECTION FFC

The forward facing center seat position(s) shall be equipped with the Passenger Safety System. The OPS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the OPS shall also provide ejection mitigation protection. Each forward facing center seating position OPS shall include:

- Advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed style seat frame located and installed at the rear wall. The seat frame shall measure approx. 62.38 inches wide X 12.38 inches high X 20.00 inches deep. The seat frame shall be constructed of approx. 0.19 inch thick aluminum plate. The forward corners of the bench shall be chamfered 45-degrees X 4.00 inches.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area centered on the front of the seat frame. Each access point shall be covered by a hinged door to allow access for storage in the seat box.

SEAT MOUNTING FORWARD FACING CENTER

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

CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have solid aluminum hinged doors with latches.

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a protective coating of dark red bed-liner.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position. A single-piece windshield will require three (3) windshield wipers.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. The each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

GRAB HANDLES

The cab shall include one (1) knurled aluminum, anti-slip exterior assist handle, installed behind each cab entry door. The grab handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand. Each grab handle shall include a full height stainless steel scuff plate that shall extend from the top of the door to the bottom of the cab or the wheel well to help protect the cab paint from damage.

REARVIEW MIRRORS

Ramco model 6015-FFHR-750HR bus style mirrors shall be provided. The mirror heads shall be polished cast aluminum and shall measure 9.75 inches wide X 13.00 inches high with an additional top mount convex assembly. The mirrors shall be mounted one (1) on each front cab corner radius below the windshield with 15.00 inch long polished cast aluminum arms with 3" vertical risers.

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

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a virtual button on the LCD style display and control screen.

EXTERIOR TRIM REAR CORNER

There shall be an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick on the outside corners at the back of the cab. The overlay shall wrap 1.00 inches forward on the sides of the cab and 12.00 inches inboard on the rear wall.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel. The inner liner shall include a 45-degree by 7.25 inch chamfered edge, with rounded corners on the interior corners of the liner.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include one manufactures emblem installed on the front air intake grille and one (1) chassis emblem with an integrated model nameplate installed on the exterior of the cab on the lower forward portion of the front driver and officer side doors.

IGNITION

A master battery system with a keyless start ignition system shall be provided.

The master switch style may be quarter turn or half turn system. The ignition may be a quarter turn switch or a rocker switch. The start system may be a push button or momentary rocker switch.

The starter button or switch shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERY

The single start electrical system shall include six (6) 1150 CCA batteries or similar with a 205 minute reserve capacity each and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

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

BATTERY CONDITIONER

A Kussmaul 40 amp battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab in the area between the driver seat and the LH rear facing outer seat position.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be temporarily installed behind the officer's seat with 4.00 foot additional hose length. The air compressor shall be plumbed to the air brake system to maintain air pressure.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:
Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well in the forward position.

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner and the air pump.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a red cover.

HEADLIGHTS

The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome housing above and outboard of the front warning and head lamps.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. Whelen OS lights are preferred.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the LCD style display. There shall be a virtual dimmer control on the LCD style display to adjust the brightness of the dash lights. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position.

GROUND LIGHTS

The vehicle shall include pre-wiring for LED stick NFPA compliant light heads with the light activation by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the LCD style display and control screen.

STEP LIGHTS

The middle step located at each door shall include one (1) On-Scene brand Night Axe LED strip light which shall activate with the opening of the respective door. The step light shall be mounted in a polished aluminum bezel.

ENGINE COMPARTMENT LIGHT

There shall be two (2) LED NFPA compliant lights mounted under the engine tunnel for area work lighting on the engine. The lights shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The lights shall activate automatically when the cab is tilted.

INTERIOR OVERHEAD LIGHTS

The cab shall include a Tecniq E20-WC0R-1 LED dome lamp located over each door. The dome lamps shall include both red and clear bulbs. The dome lamps shall be round in shape and shall measure approximately 6.00 inches in diameter with chrome colored bezel. The light shall be activated by a three position toggle switch which shall be recessed in the ceiling on the side of the light as well as the clear portion of each lamp shall be activated by opening the respective door and shall override the active light regardless of which position the switch is in and shall return to the current switch position when the door is closed.

An additional two-section, red and clear Whelen LED dome lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

OVERHEAD MAP LIGHTS

There will be two (2) white LED, round, adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position
- One (1) overhead in front of the officer's position

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include two (2) flashing Whelen OS Series LED lightheads, one (1) red LED and one (1) amber LED, clearly labeled "Do Not Move Apparatus". In addition to the flashing lights, an audible alarm shall be included which shall sound while either light is activated.

Each flashing light shall be approximately 1.50 inches long X 1.00 inches wide X 0.50 inches high and shall be located centered left to right for greatest visibility.

The red light shall be interlocked for activation when a cab door is not firmly closed and the parking brake is released. The amber light shall be wired to the apparatus body by the OEM.

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the LCD-style display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a virtual button on the LCD-style display and control screen.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the "DoubleFlash 150" left/right flash pattern.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the "DoubleFlash 150" left/right flash pattern.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red with a clear lens.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the LCD-style display and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be set to flash “DoubleFlash 150” left/right flash pattern.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be recess mounted into the side face of the bumper.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. The light shall be programmed to emit the "DoubleFlash 150” left/right flash pattern.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red with clear lens.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

AUXILIARY SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen series M6 Super LED 4.00 inch X 6.00 inch warning lights, one (1) each side, which shall feature multiple flash patterns including steady burn. The warning lights shall be set to flash “DoubleFlash 150” left/right flash pattern.

AUXILIARY SIDE WARNING LIGHTS COLOR

The auxiliary warning lights located on the side of the cab shall be red with clear lens.

AUXILIARY SIDE WARNING LIGHTS LOCATION

The auxiliary warning lights on the side of the cab shall be mounted rearward of the cab “B” pillar in the highest position available.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the LCD-style display and control screen. This button shall be clearly labeled for identification.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar installation shall include mounting and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR

The lightbar provisions shall be for one (1) Whelen brand Freedom FN72VLED lightbar mounted centered on the front of the cab roof. The lightbar shall be 72.00 inches in length. The lightbar shall feature ten (10) red LED lights and four (4) clear LED lights. The clear lights shall be disabled with park brake engaged. The lightbar shall include an Opticom mounted centered in the front of the light bar. The cable shall exit the lightbar on the left side of the cab.

LIGHTBAR SWITCH

The light bar shall be controlled by a virtual button on the LCD-style display and control screen. This button shall be clearly labeled for identification.

TRAFFIC CONTROL

There shall be one (1) GTT (Global Traffic Technologies) Opticom model 795H traffic control optical emitter mounted in the lightbar on the front of the cab roof. There shall be an indicator light on the dash. The emitter shall be activated by the master warn switch and shall be deactivated when the parking brake is applied.

SIREN CONTROL HEAD

A Whelen 295HFSC9 electronic siren control head shall be provided. The siren head shall feature a 200-watt output, wail, yelp, manual siren, and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected. The siren shall be mounted to protrude through the center panel of the cab dash in the lower section centered from left to right in the panel.

HORN BUTTON SELECTOR SWITCH

A virtual button on the LCD-style display and control screen shall be provided to allow control of the electric horn or the air horn from the steering wheel horn button. The horn button selection shall default to the air horn each time the LCD-style screen power is cycled off and on. The electric horn shall sound when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and a right hand side Linemaster model SP491-S81 foot switch for the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by two (2) Linemaster model SP491-S81 foot switches mounted in the front section of the cab for use by the driver and officer. A red momentary siren brake rocker switch shall be provided in the switch panel on the dash. The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis. The alarm shall automatically activate when the transmission is placed in reverse. It alarm shall be placed as far as practical from any microphones mounted on the rear of the vehicle (backup cameras).

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an indicator displaying Diesel Exhaust Fluid (DEF) shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a

red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

RED LAMPS
Stop Engine-indicates critical engine fault
Air Filter Restricted-indicates excessive engine air intake restriction
Park Brake-indicates parking brake is set
Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened
Low Coolant-indicates engine coolant is required

AMBER LAMPS
MIL-indicates an engine emission control system fault
Check Engine-indicates engine fault
Check Trans-indicates transmission fault
High Transmission Temperature-indicates excessive transmission oil temperature
ABS-indicates anti-lock brake system fault
HEST-indicates a high exhaust system temperature
Water in Fuel-indicates presence of water in fuel filter
DPF-indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration has been postponed due to user interaction
Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.
SRS-indicates a problem in the RollTek supplemental restraint system
Check Message-Turn Signal On
Check Message-Door Ajar
Check Message-Cab Ajar
Check Message-ESC Active
Check Message-DPF Regen Active
Check Message-No Engine Data
Check Message-No Transmission Data
Check Message-No ABS Data
Check Message-No Data All Communication With Vehicle Systems Has Been Lost
Check Message-Check Engine Oil Level
Check Message-Check Washer Fluid Level
Check Message-Check Power Steering Fluid Level
Check Message-Low Transmission Fluid Level
Check Message-Check Coolant Level

GREEN LAMPS
Left and Right turn signal indicators

ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle-indicates engine high idle is active.
Cruise Control-indicates cruise control is active
OK to Pump-indicates the pump engage conditions have been met
Pump Engaged-indicates the pump is currently in use
Auxiliary Brake-indicates secondary braking device is active

BLUE LAMPS
High Beam Indicator

WHITE LAMP
Wait to Start-indicates active engine air preheat cycle

AUDIBLE ALARMS FROM GAUGE PACKAGE
High Trans Temp
High or Low Voltage
Check Engine
Check Transmission
Stop Engine
Low Air Pressure
Fuel Low
Water in Fuel
ESC
High Coolant Temperature
Low Engine Oil Pressure
Low Coolant Level
Low DEF Level
Air Filter Restricted
Extended Left and Right Turn Remaining On
Cab Ajar
Door Ajar
ABS System Fault
Seatbelt Indicator

EXTERNAL AUDIBLE ALARM
Air Filter
Cab Ajar
Door Ajar
Check Engine
Stop Engine
Low Air Pressure
Water in Fuel
Low DEF
ABS System Fault
Seatbelt Indicator

The gauges will have white faces with black text.

BACKLIGHTING COLOR
The instrumentation gauges and the switch panel legends shall be backlit using blue LED backlighting.

CAMERA

An Audiovox Voyager heavy duty rearview camera system, complete with an LCD display monitor, shall be supplied. One (1) box shaped camera shall be provided in the body to afford the driver a clear view to the rear of the vehicle.

The camera shall be wired to a 7.00 inch flip down monitor which shall include a color display and day and night brightness modes installed above the driver position. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

The camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

The cab and chassis shall include diagnostic software for the Passenger Safety System shipped loose with the vehicle. The software kit shall include an interface module with connectors to link a laptop computer to the vehicle for diagnostic purposes.

WARRANTY

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the end user. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

CHASSIS OPERATION MANUAL

There shall be two (2) complete sets of chassis operation manuals provided with the chassis. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy. Each manual shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:
(1) Digital copy of the Engine Owner's manual

(1) Digital copy of the Transmission Operator's manual
(1) Hard copy of the Engine Operation and Maintenance manual with CD

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams. One (1) set shall be a printed hard copy, one (1) set shall be a digital copy.

AS BUILT AIR PLUMBING DIAGRAM

The cab and chassis shall include two (2) complete sets of the as built air plumbing system and option air plumbing diagrams. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy.

AS BUILT FUEL PLUMBING DIAGRAM

The cab and chassis shall include two (2) copies of the as built fuel system plumbing diagram. One (1) shall be a printed hard copy, one (1) shall be a digital copy.

CUSTOMER INSPECTION

There shall be a customer inspection of the chassis at the manufacturer's plant. The dealer, or the OEM shall be responsible for all travel costs and arrangements.

The date of the chassis inspection shall be determined based on the requested chassis completion date, OEM production schedules, the chassis off-line date, and the chassis completion date.

The inspection must be coordinated between the OEM/Dealer representative and the HFD

BUMPER EXTENSION ADDITIONS

There shall be a hose well provided in the center of the front bumper extension. The hose well shall be made of smooth aluminum and shall have the edges flush with the gravel shield. The well will be as deep as possible from the front grille to the front bumper flange (to go into the flange with a deflector plate), as wide as possible from frame rail to frame rail, and it will not go lower than the bottom of the front bumper. There shall be modular floor tiles located in the bottom and drain holes provided in the corners.

There shall be an embossed aluminum diamond plate cover installed on the front bumper compartment. There shall be a notch in the front corner adjacent to the front discharge.

The rear edge of the cover shall be attached with a stainless steel hinge. The cover shall be equipped with a D-ring style latch to secure the cover in the closed position and utilize one (1) gas shock hold open device.

The hose well shall be located in the front bumper of the apparatus and shall be designed to hold the maximum amount of hose possible in the space available.

CAB TILT CONTROL

There shall be a cab tilt pendant control provided and installed on the right side of the apparatus. The pendant shall be located directly behind the upper auxiliary pump access door.

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

FUEL FILL ASSEMBLY

There shall be a fuel fill assembly located on each side of the apparatus body accessing the chassis supplied fuel tank. The assembly shall be located behind the rear axle on each side.

The fuel fill assembly will not have a door. There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be removable, manufactured of plastic materials, green in color and equipped with a tether.

The fuel fill cap shall be labeled "DIESEL FUEL". The stainless steel fuel fill neck shall have a 3/8" inside diameter vent line installed from the top of the fuel tank to the fill tube.

The fuel overfill and tank vent will be "T" connected at the end of the tube and be above 40".

TOOL STORAGE PANEL

There shall be a 3/16" aluminum "L" wall (iron storage) shall be installed behind the driver's seat. The wall shall be approximately 37" tall or the height of the PAC TRAC iron mount. There shall be a floor that is attached to the two side panels. The entire tool panel shall be secured to the "B" pillar. This panel shall be installed behind the drivers seat.

The panel shall be sprayed with red bed-liner to match the interior cab finish.

HAND HELD LIGHTS

There will be four (4) 12v Streamlight, Fire Vulcan, Model #44451 lights, provided by the vendor, mounting location within cab to be determined at preconstruction.

Each light housing will be orange in color and be provided with a C4 LED and two (2) "ultra bright blue tail light LED's". The tail light LED's will have a dual mode of blinking or steady.

Vehicle mount with 12VDC direct wire charging rack.

Quick release buckle strap will be included.

INTERIOR STORAGE COMPARTMENT/RADIO COMPARTMENT

There shall be one (1) radio compartment shall be installed inside of cab. The compartment will have two (2) sections with a lower open section (covered with snapped on cargo net) and an upper walled off slide-out section.

The lower compartment shall have an adjustable DA finished shelf with Uni-Strut channel on the interior side walls.

The top section shall have a 10" opening with a slide out tray. The front and rear of the top section shall be vented with the rear vented plate being a removable section to access the slide out tray.

The lower compartment shall have a 2" red webbing that is attached to the lower section by use of snaps. The compartment shall have a full length OnScene light installed with a rocket switch located

inside the upper left hand corner. There will be an aluminum wire chase channel provided on the exterior back wall of the cabinet – the channel shall be a hat channel 2” wide and sprayed with red speedliner.

The compartment shall be installed behind the officer's seat, pushed forward as much as possible without interfering with the officer's seat operations

The compartment shall be sprayed with red bed-liner inside to match the interior. Final dimensions are done at Pre-construction conference.

RADIO & ANTENNA MOUNTING BASE

There shall be two (2) Larsen GPSDM700/2500FFS roof mounted antennas with sufficient length of 50 OHM coax cable and weather proof cab shall be supplied for two-way radios installed on the apparatus. The mounts shall be located on the cab roof in a best fit location determined by manufacturer but shall be at a minimum 36" apart. The cable shall be routed to the radio compartment with enough cable for the customer to route to the instrument panel if needed.

There will also be four (4) customer supplied speakers installed in the cab per HFD specifications. Two (2) of the speakers will have transformers. One in each rear corner of the cab and one behind the driver and officer up high, all speakers shall be aimed forward with a slight downward angle

There will also be one (1) customer supplied radio installed flush in the upper left on the right side dash panel.

There shall be one (1) Gamber Johnson GJ DS-56 MDC horizontal surface base, with a Gamber Johnson GJ 7160-0419 Tilt/swivel motion attachment installed on the apparatus.

There shall be one (1) CF-AA5713AM-TM AC Power Adapter for the Panasonic MDT laptop installed in the cab as directed by Houston Fire Department Locations determined at pre-construction.

BATTERY CHARGER DISPLAY

A battery charger bar graph display shall be furnished and installed to the driver’s seat box. LED display shall be model # 091-1899-12-3.5D and shall be wired so to display the battery charge at all times even without the Kussmaul plugged in.

AIR TANK DRAIN CABLES (extended)

There shall be manual pull air tank drain cables provided with the apparatus under the front of L1. The cables shall be extended to the outer edge of the apparatus to facilitate draining moisture from the chassis air tanks. A label shall be affixed indicating “Air Tank Drain”.

HOSE AND HARNESS ROUTING

Any wiring harness or hydraulic /air hoses that must pass to the outside of the frame will not run over or under the frame flanges. Hydraulic and airlines will pass through the frame using bulkhead fittings. All

battery cables will also utilize bulkhead fittings. Wiring harnesses will pass through the frame within a protective rubber boot. For ease of maintenance, the hydraulic air hoses and electrical wiring harness will be ran separately down each side of the frame rails. The hydraulic and air hoses run down the right side of the frame rails, and the electrical harnesses run down the left side of the frame rails.

CHASSIS REQUIRED LABELING

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided. The signs shall be visible from all seating positions.

There shall be a lubrication plate mounted inside cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid (if applicable)
- Drive Axle Lubrication Fluid
- Generator Lubrication Fluid (if applicable)
- Tire Pressures

CAB WARRANTY PLATE

A cab warranty plate will be provided. The exact warranties to be listed and how/where they are listed will be determined at pre-con. Warranty information is also listed in the LCD style display.

APPARATUS INFORMATION LABEL

There shall be a high-visibility label installed in a location clearly detectable to the driver while in the seated position.

The label shall indicate the following specified information:

- Overall Height listed in feet and inches.
- Overall Length listed in feet and inches.
- Overall GVWR listed in tons or metric tons.

CAB HELMET WARNING LABEL

A high-visibility label shall be installed in a location clearly detectable from each seating position. The label shall indicate the following specified information.

“DO NOT WEAR HELMET WHILE SEATED”

HELMET RESTRAINTS

All NFPA required helmet restraints will be supplied and installed by the Customer prior to the truck being placed into service.

MUD FLAPS

Heavy-duty rubber mud flaps shall be provided behind the rear wheels. The mud flaps shall be black

rubber type and be bolted in place.

EXHAUST HEAT SHIELD

There shall be an exhaust heat shield added to the chassis provided exhaust. The shield shall run the full length of the exhaust system, terminate past the R1 compartment and shall incorporate a heavy duty spray on insulation under R1. With this shield the temperature of the R1 compartment shall not exceed the ambient temperature.

PUMP COMPARTMENT

The complete apparatus pump compartment shall be constructed of a combination of structural tubing and formed sheet metal. The same materials used in the body shall be utilized in the construction of the pump compartment. The structure shall be welded utilizing the same A.W.S. Certified welding procedure as used on the structural body module. These processes shall ensure the quality of structural stability of the pump compartment module.

The pump compartment module shall be separated from the apparatus body with a gap. This gap is necessary to accommodate the flexing of the chassis frame rails that is encountered while the vehicle is in transit so that harmful torsional forces are not transmitted into the structural framework.

AIR CHUCK OUTLET

There shall be a quick disconnect air chuck outlet furnished and installed on the apparatus. The air chuck outlet shall be plumbed to the chassis air system and have on/off valve and label on the left side lower pump compartment sill.

SIDE OPERATORS PANEL

The pump operator's panel shall be located on the left, upper side of the apparatus pump compartment. The panel shall be split into an upper and lower section. The upper panel shall house all gauges and controls and be hinged to allow easy access to those components. The door shall have a stainless steel hinge, dual point chrome push button latches and a rubber seal provided to prevent excessive moisture from entering or leaving the pump house. The lower panel shall be a removable panel attached with mechanical fasteners.

Valve controls shall be immediately adjacent to its respective gauge. The valve controls shall be properly labeled and color coded for ease of use. All markings shall be permanent in nature.

PANEL LIGHTS

Adequate illumination shall be provided for all gauges and controls by means of a reinforced .125" embossed diamond plate light shield with one (1) full width OnScene LED "Night Stik" light on the left side above the gauge panel or an adequate amount of lights space permitting.

The right side pump compartment shall have a reinforced 3/16" embossed aluminum diamond plate light shield installed with one (1) full width OnScene LED "Night Stik" light to illuminate the plumbing components.

There shall be a switch located on the operator's pump panel to turn all of the the pump panel lights on or off. This switch shall also activate all area step and ground lighting. All pump panel, step, and ground lights will illuminate when the pump is engaged and it is "OK TO PUMP".

PUMP COMPARTMENT FRONT OVERLAY

The front wall of the pump compartment module shall be overlaid entirely with tread plate and shall have a removable pump access panel made of aluminum treadplate fastened with 1/4x20 SST bolts (NOT SCREWS).

PUMP COMPARTMENT STRUCTURE

The structural framework of the pump compartment shall be self-supportive and independent of the apparatus body. The pump module shall be approximately 74" in width as measured laterally across the apparatus. The width of the apparatus as measured longitudinally (measured within the wheelbase dimension of the apparatus) shall be specified in the remainder of the specifications.

The exposed pump house tubing will be painted job color.

The width of the pump compartment (front to back) shall be 52".

APPARATUS LABELING

The apparatus shall be descriptively tagged with color coded metal labels. The labels shall be applied near the apparatus features that require a user function description. Wherever necessary, the labels shall be color coded to differentiate controls and their respective functions to simplify and clarify complex configurations.

All labels that are not installed into discharge handles shall be attached with mechanical fasteners.

BEZELS FOR DISCHARGE GAUGES

Deluxe metal bezels shall be supplied around the discharge pressure gauges.

BEZELS FOR VALVE CONTROL HANDLES

Deluxe Innovative Controls handles shall be supplied around the openings in the pump panels for all valve control handles.

BEZELS FOR DISCHARGES AND INLETS

Mirrored stainless steel bezels shall be supplied around the openings in the pump panels for all discharge and suction inlet fittings.

BLACK ANNODIZED SIDE PANELS

There shall be two (2) hinged pump panels on the right side of the pump compartment, one (1) upper and one (1) lower. Each panel shall be accessible by quick-release type latches, closing against a outer door seal (no middle sill). Both panels shall be hinged on the cab side for easy access to the pump for service. The panels will have gas strut hold open devices and be on the door open warning system.

All panels shall be made from heavy duty 3/16" "Black Annodized" aluminum, capable of withstanding the effects of extreme weather and temperature. The upper panel will be as large as possible with the lower panel ending just above the highest plumbing. Each panel to have full height and width hat

channel reinforcements that are screwed into place.

The tubular structure shall be overlaid on each side of the pump compartment underneath the access panels and shall be made of 3/16" "Black Annodized"aluminum.

PAINTED PUMP HOUSE TUBULAR STRUCTURE

The tubular structure shall be painted job color.

RUNNING BOARDS

The running boards shall be made of a structural tubular framework. The tubular frame support all loads by transmitting the loads through the pump compartment structure directly to the chassis frame rails.

The running boards shall be independent of the apparatus body and shall be integrated to the pump compartment structure only, eliminating any pump compartment to body interference. This is essential in keeping a truly 'modular' configuration. Slip-resistant abrasive adhesive materials shall be applied to the top surface of the running board framework to provide a suitable stepping surface.

LEFT HOSE WELL

The left side running board area shall have a hose well with compartment matting and drain holes.

The hose well shall be fabricated of 1/8" aluminum diamond plate. The hose well shall be formed so that the smooth surface of the material is to the inside of the well and the raised diamonds show to the exterior.

The hose well shall be bolted into the tubular structural framework of the pump compartment running board for easy removal in the event that it may become damage requiring replacement. The hose well shall be approximately 10" deep (measured from the top of the running board) and as wide and long as possible to fit in the framework of the running board.

There shall be an approx. 12” stepping surface of 3/16” embossed aluminum diamond plate material located below the crosslay or speedlay to aid in loading or unloading hose.

The hose well will be 32" long by 10" deep by 10.5" wide. The capable of holding 50' of 5" hose. The front corner of the running board to be chamfered to match the cab width.

There shall be two (2) velcro straps provided at the top of the hose well. The straps shall be used to hold the hose in place during transit.

RIGHT HOSE WELL

The right side running board area shall have a hose well with compartment matting and drain holes.

The hose well shall be fabricated of 1/8" aluminum diamond plate. The hose well shall be formed so that the smooth surface of the material is to the inside of the well and the raised diamonds show to the exterior.

The hose well shall be bolted into the tubular structural framework of the pump compartment running board for easy removal in the event that it may become damage requiring replacement. The hose well shall be approximately 10" deep (measured from the top of the running board) and as wide and long as

possible to fit in the framework of the running board.

There shall be a 12" stepping surface of 3/16” embossed aluminum diamond plate material located below the crosslay or speedlay to aid in loading or unloading hose.

The hose well will be approx. 32” long by 10" deep by 10.5" wide. The capable of holding 50' of 5" hose. The front corner of the running board to be chamfered to match the cab width.

There shall be two (2) velcro straps provided at the top of the hose well. The straps shall be used to hold the hose in place during transit.

TESTING PORTS

Test port connections for pressure and vacuum shall be provided at the pump operator's panel. One shall be connected to the intake side of the pump, and the other to the discharge manifold side of the pump. They shall have 0.25 in. standard pipe thread connections and be manufactured of non-corrosive polished stainless steel or brass plugs.

PRESSURE GOVERNOR

The Pressure Governing System supplied with the chassis shall be installed on the pump panel. The PSG allows for pump pressure control and throttle control.

The PSG installation shall be wired specifically for the Cummins electronic engine.

SUCTION RELIEF VALVE

An Elkhart suction relief valve with a range of pressure adjustment from 75 to 250 PSI shall be installed inside pump compartment piped to the suction side of the pump.

The valve shall be preset at 125 PSI suction inlet pressure. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere via the unloader pipe and shall dump on the opposite side of the pump operator.

The valve shall come with 2 1/2" male NST threads that can be capped if the relief valve fails in the open position. For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "INTAKE RELIEF DO NOT CAP" installed.

HEAT EXCHANGER

The supplementary heat exchanger cooling system provided on the chassis, it shall be complete to the discharge side of the fire pump through to the engine compartment, without intermixing, for absorption of excess heat.

The heat exchanger shall be adequate in size to maintain safe operating temperature of the coolant in the pump drive engine and not in excess of the engine manufacturer's temperature rating, under all pumping conditions. Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing.

A manual shut-off, Class One 1/4” Ball Valve (#14BV) shall be supplied at the pump operator's position.

AIR HORN BUTTON

There shall be an air horn activation red push button furnished and installed on the pump operator's gauge panel. The air horn button shall be of weather resistance type and labeled “AIR HORN”.

This button will be in a cluster with the panel light and side scene lights.

PUMP COMPARTMENT TOP OVERLAY

The top of the pump compartment shall be overlaid with materials of a non-slip 3/16" embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

DUNNAGE AREA

A single wall 3/16" aluminum diamond plate dunnage area shall be provided above the pump house compartment for equipment mounting and storage space. The dunnage area will have recessed storage areas on each side of the deluge gun that encompass the open area between the body, cross lay, and deluge gun plumbing.

MIDSHIP PUMP

The pump shall have the capacity of 2000 gallons per minute, measured in U.S. gallons. The pump shall be a Hale Fire Pump, QMax-200, single stage.

The entire pump shall be manufactured at the pump manufacturer's factory. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body shall be horizontally, on a single plane, in two sections, for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump on the chassis. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance

The pump shall have one (1) double suction impeller made of hard, fine grain bronze of the mixed flow design; accurately machined, hand-ground and individually balanced. The vanes of the impeller intake eyes shall be hand ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. The pump shaft is to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The gearbox bearings shall be heavy-duty, deep groove ball bearings and they shall be splash lubricated. All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. The bores shall be ground to size and teeth integrated, crownshaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

Impeller clearance rings shall be removable and made of noncorrosive material. The pump shaft shall be heat-treated, electric furnace, corrosion resistant, stainless steel. The pump shaft must be sealed with double lip oil seal to keep road dirt and water out of the drive unit.

The pump drive unit shall be of sufficient size to withstand up to 16,000 lbs/ft of torque of the engine in both road and pump operating conditions. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature. The drive unit shall be cast and completely manufactured and tested at the pump manufacturer factory.

The gearbox drive shafts shall be of heat treated chrome nickel steel and at least 2 3/4" in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

The pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. The pump shall be free from objectionable pulsation and vibration.

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected. The pump shall be driven by a drive line from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.

The pump must deliver the percentages of rated capacity at these pressures:

- 100% of rated capacity at 150 pounds net pressure,
- 100% of rated capacity at 165 pounds net pressure,
- 70% of rated capacity at 200 pounds net pressure,
- 50% of rated capacity at 250 pounds net pressure.

Since this pump is available to all vendors on an equal basis, there shall be no exception to the Hale QMax pump specifications.

MASTER DRAIN VALVE

There shall be a manifold type drain valve installed in the pump compartment. All pump drains shall be connected to the master drain valve. The drain valve shall be controlled on the left side lower pump house sill. The control shall be a hand wheel knob marked “open” and “closed”.

The drain shall be located such that it shall not interfere with pumping operations or function such as soft suction hoses, etc. nor shall it protrude past the outer edge of the apparatus, to prevent damage to the valve.

In some cases, it is necessary to locate the master drain in a secondary location to ensure proper function, such as draining, or if no lower or vertical sill exists. In this event, the drain shall be located below the bottom outside edge of the hose body near the forward most corner on the driver’s side hose body. The drain shall not protrude past the outer edge of the body, thus preventing damage to the valve.

PUMP SEAL

A mechanical seal shall be supplied on the inboard side of the pump. The mechanical seal must be two

(2) inches in diameter and shall be spring-loaded, maintenance-free and self-adjusting. Mechanical seal construction shall be a carbon sealing ring, stainless steel coil spring, Viton rubber cup, and a tungsten carbide seat.

PUMP SHIFT

The drive unit shall be provided with an air pump shift system. The control valve shall be a spring loaded guard lever that locks in "Road" or "Pump" mode.

To the left of the pump shift control, there shall be two indicator lights to show the position of the pump when the control is moved to "Pump" position. A green light shall be energized when the pump shift has been completed and shall be labeled "PUMP ENGAGED"; a second green light shall be labeled "OK TO PUMP" energized when both the pump shift has been completed and the chassis automatic transmission is engaged.

A third green indicator light shall be installed adjacent to the throttle on the pump operator's panel. This light shall be labeled "Throttle Ready".

In addition to this indicator light, ALL panel lights and the rear center compartment lights shall illuminate when the pump is ready to pump.

The pump shift shall be located in the upper left of the center switch panel above the Park Brake control

PRIMING SYSTEM

The priming system shall be a positive displacement, oil-less electrically driven rotary vane priming pump rigidly attached to the pump transmission.

The priming pump shall be self-lubricating and shall not require lubrication. The pump, when dry, shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose through the steamers.

PRIMER CONTROL

There primer shall be activated by an electric push button control valve, Hale model "SPV".

THERMAL RELIEF VALVE

A Hale TRV-120-L thermal relief valve with light and buzzer kit shall be installed to protect the pump from overheating. It shall be mechanical and will not require operator monitoring. It shall automatically reset in the event of it going into operation. It shall contain an integral strainer to keep mechanism free of contamination. It shall be set at 120 degrees F(49 degrees C).

Relief valve shall discharge out below the running board. A warning light, shall be installed on the pump panel to alert the operator that the relief valve is open. It will be accompanied by an audible alarm.

STEAMER INLETS

There shall be two (2) 6" inlets installed, one on either side of the pump. The inlets shall each have short suction tubes so the inlets will protrude 1-2" away from the side panels. This will allow for an external valve to be connected while keeping the valve from protruding past the running board. Each

inlet shall have 6" NST threads and a removable strainer.

INTAKE WATERWAY VALVE(S)

There shall be two (2) a manually operated Hale Master Intake Valve with drains.(*Hale MIV*).

The inlet valve shall be a full flow butterfly type valve designed to mount on the fire pump between the suction tube extension and suction tube behind the pump compartment panel. The valve shall not interfere with other suction or discharge openings on the fire pump or with pump operating controls when properly mounted.

The entire valve shall be manufactured and tested at the pump manufacturer's factory.

The valve body and related components that are in contact with water shall be manufactured of fine grained corrosion resistant bronze.

The butterfly disc shall be manufactured from 80,000 PSI minimum yield strength heat treated cast steel then coated with a durable nitrile rubber to provide a positive seal when the valve is closed.

Testing and rating of the valve shall be accomplished at the valve manufacturer's factory. The valve, less relief valve, shall be hydrostatically tested to 600 PSIG. The valve shall then be vacuum tested to 26 inches Hg.

A pressure relief valve shall be provided that is factory set to 125 PSI and field adjustable from 75 to 250 PSI. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed. An integral relief valve mounting pad shall be provided on the valve body. This mounting pad shall provide a Hale type 115 4-3/8 inch bolt circle flange for normal installation. The mounting pad shall have 2-½ inch female NPT threads to permit remote mounting of the relief valve without special adapters. The outlet of the pressure relief valve shall have 2-½ inch NPT threads to allow directing the discharge flow away from the pump operator position.

The relief valves will be plumbed to the officer and driver sides of the pump house with a 2.5" MNST termination so it can be capped for high rise operations.

The inlet valve shall be operated by a manual hand wheel located next to the suction tube.

Each valve shall be provided with panel placards indicating control operation. The placards shall have status lights to indicate whether the valve is open, closed or traversing from one position to another.

Each valve shall be provided with a gear actuator that will cycle the valve from OPEN to CLOSED position in no less than 3 seconds. The gear actuators shall be sealed units designed to provide reliable service in the harsh pump compartment environment. The ratio of the gear actuator shall be such that the hand wheel will close the valve in no more than 10 complete turns.

The valve body shall have a ¾ inch female NPT threaded port on the top to allow installation of an NFPA compliant large diameter hose air bleeder valve. The air bleeder valve shall be mounted on the operator panel and be controllable by the pump operator. Air bleeder valve connections shall have a restriction no larger than ¾ inch to prevent water hammer when filling hose.

The valve body shall have a ¼ inch female NPT threaded port on the bottom to permit connection of an individual water drain valve.
The valve shall be equipped with o-ring seals for the mounting flanges. The o-ring seal groove shall be sized for proper squeeze of the o-ring for pressures in excess of 600 PSIG.

There shall be two (2) TFT 6"NST Female Swivel x 5" Storz aluminum elbows with 5" Storz x 4" FHFD adapters.

PUMP COOLING LINE

There shall be a 3/8" line run from the pump to the water tank to assist in keeping the pump water from overheating. There shall be a 1/4 turn on/off valve installed on the operator's panel.

PUMP ANODE(S)

Two (2) pump anode(s) shall be installed in plumping system of the apparatus, to prevent damage from galvanic corrosion within the pump system.

STAINLESS STEEL PLUMBING

All auxiliary suction and discharge plumbing related fittings, and manifolds shall be fabricated with schedule 10 stainless steel pipe, brass or high pressure flexible piping with stainless steel couplings – NO EXCEPTIONS. Galvanized components and/or iron pipe shall NOT be accepted to ensure long life of the plumbing system without corrosion or deterioration of the waterway system. Where waterway transitions are critical (elbows, tees, etc.), no threaded fittings shall be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valves shall be non-painted, unless otherwise specified. All piping welds shall be wire brushed and cleaned for inspection and appearance.

The high pressure flexible piping shall be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.5" through 4". Sizes 3/4", 1" and 5" are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1" through 5" for maximum performance in tight bend applications. The material has a temperature rating of -40° F to +210° F.

The stainless steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male 3/4" and 1" couplings are brass. A high tensile strength stainless steel ferrule with serrations on the I. D. is utilized to assure maximum holding power when fastening couplings to hose.

The grease points for all valves will be plumbed together to a grease zert permanently mounted on the right side of the pump house. It will be easily accessible from the upper right door, and labeled.

All nylon gauge lines will have compression fittings and not push in style.

PUMP HOUSE LINE PROTECTION

All drain lines for the discharges, suctions, ABS discharge gauge lines and any other connections in the pump house area shall have a protective cover provided on the lines in the required areas of the lines to prevent the lines from rubbing on any other components in the pump house area.

All drain lines, ABS lines, high pressure discharge lines and electrical wiring in the pump house area shall be properly and neatly routed, wire tied and rubber coated “P” clamped, to keep the items secured.

All manual drains shall be model Class One #34BV ¾” ball valve with quarter turn cast T-Handle.

2 1/2" RIGHT SIDE INLET

There shall be a gated suction inlet with 3/4" bleeder installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- A 2 1/2" Elkhart Brass Unibody valve model EB20 with stainless steel ball and dual self adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The control valve shall be a 'swing out type' direct operation manual lever actuator.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The suction termination shall include the following components:

- One (1) 2 ½" NST swivel female adapter with screen
- One (1) 2 ½" male self-venting plug, secured by a chain

2 1/2" LEFT SIDE INLET

There shall be a gated suction inlet with 3/4" bleeder installed on the left side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- A 2 1/2" Elkhart Brass Unibody valve model EB20 with stainless steel ball and dual self-adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The control valve shall be a 'swing out type' direct operation manual lever actuator.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The suction termination shall include the following components:

- One (1) 2 ½" NST swivel female adapter with screen
- One (1) 2 ½" male self-venting plug, secured by a chain

LEFT SIDE DISCHARGE

There shall be a gated discharge installed on the left side of the apparatus. A total quantity of two (2) shall be provided with the following specified components:

- A 2 1/2" Elkhart Brass Unibody valve model EB25 with stainless steel ball and dual self-adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The discharge shall be controlled at the operator's panel with a push pull handle.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 ½" Male NST adapter.
- One (1) 2 ½" NST female by male swivel w/45 degree elbow.
- One (1) 2 ½" female by 1 ½" male reducer.
- One (1) 1 ½" female self-venting cap, secured by a chain.

A "No Shok" 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

LEFT REAR DISCHARGE

There shall be a gated discharge installed on the left rear of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- A 3" Elkhart Brass Unibody valve model EB30G1F handwheel actuated control with stainless steel ball and dual self adjusting polymer seats. The handwheel will be set so that when closed the handle is at 6 o'clock.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance. The valve shall be operated using a 50:1 gear drive actuator. The actuator shall be quickly adjustable to one of four positions and require 12 revolutions from full open to full close.
- The plumbing shall consist of 3" Class 1 high pressure vapor hose, stainless steel couplings and/or stainless steel piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 3" female NST adapter.
- One (1) 3" NST male by 2.5" female w/45 degree elbow.
- One (1) 2.5" male self-venting cap, secured by a chain.

A "No Shok" 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

DISCHARGE OUTLET (Front Bumper)

One (1) front bumper discharge outlet shall be provided and installed as specified:

- A 2" Elkhart Brass Unibody valve model EB20 with stainless steel ball and dual self-adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2" piping, and incorporate a manual drain control installed below the pump area for ease of access. Auto and manual drains shall be installed in the discharge piping at lowest point of the plumbed system.

The discharge termination shall include the following components:

- One (1) 2" NPT x 1 ½" NST, polished SST chicksan swivel

- One (1) tread plate swivel guard that will prevent the chicsan from going passed 180 degrees to either side towards the cab.

The front bumper discharge shall be mounted on top of the gravel shield of the front bumper extension. The discharge shall be placed next to the hose well specified to allow hose to be pre-connected and stored in the well. The discharge will be just outboard of the air horn.

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

RIGHT SIDE DISCHARGE

There shall be a gated discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- A 3" Elkhart Brass Unibody valve model EB30G1F handwheel actuated control with stainless steel ball and dual self-adjusting polymer seats. The handwheel will be set so that when closed the handle is at 6 o'clock.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance. The valve shall be operated using a 50:1 gear drive actuator. The actuator shall be quickly adjustable to one of four positions and require 12 revolutions from full open to full close.
- There will be a labeled and bezeled manual override on the officer side pump panel.
- The plumbing shall consist of 3” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 3” NST female x 2 ½ NH w/30 degree elbow.
- One (1) 2 1/2" NST self-venting cap, secured by a chain.

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

MASTER DISCHARGE

There shall be a master discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- A 4" Elkhart Brass Unibody valve model EB40G1F handwheel actuated control with stainless steel ball and dual self-adjusting polymer seats. The handwheel will be set so that when closed the handle is at 6 o'clock. There will be a discharge relief valve that terminates on the officer side with 2.5" MNST and is set to 250PSI.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance. The valve shall be operated using a 50:1 gear drive actuator. The actuator shall be quickly adjustable to one of four positions and require 12 revolutions from full open to full close.
- The plumbing shall consist of 4” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 4” NST adapter.
- One (1) 4” NST female swivel by 5”Storz cast aluminum 30 degree elbow.
- One (1) 5" Storz by 4" MHFD adapter.
- One (1) 4” FHFD self-venting cap, secured by a chain.

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

DOUBLE STACK CROSSLAYS

The crosslay hose beds shall be located in the upper portion of the pump compartment. The crosslay shall be constructed with a twenty-four (24") inch approximate depth for laying a double stack of each hose size specified below. The crosslay area shall be located at the front of side control module apparatus and at the rear of top control module apparatus. The crosslay area shall span the entire width of the pump module apparatus. Removable slotted aluminum flooring shall be provided for hose area. Chicksan swivels shall be installed just below the floor of each crosslay bed just high enough for hose couplings to be accessed and tightened on to the chicksans. The chicksan swivels shall swing from left to right to allow attached hose to be deployed from either side. The dividers between the crosslay hose beds shall be cut at 45 degrees on each end and have two (2) vertical hand cutouts, one (1) located at each end.

Two (2) crosslays shall be provided for up to 250 feet of 1 3/4" hose as specified:

- A 2" Elkhart Brass Unibody valve model EB20 with stainless steel ball and dual self-adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2” NPT x 1 ½” NST brass chicksan swivel

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

One (1) crosslay shall be provided for up to 250 feet of 2 1/2" hose as specified:

- A 2 1/2" Elkhart Brass Unibody valve model EB25 with stainless steel ball and dual self-adjusting polymer seats.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2 1/2” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 ½” NPT x 2 ½” NST brass chicksan swivel

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

CROSSLAY TRIM

Mirrored stainless steel trim shall be installed at the openings on each side of the crosslay hose bed area. The trim shall reduce the chaffing of the hose jacket on the edges of the bay area.

CROSSLAY COVER

The crosslay hose bed area shall (1) piece hinged 3/16" embossed aluminum tread plate cover. The cover shall be installed to provide a solid surface over all bays and have a mechanical butterfly latched holding the cover in the closed position. The side area where the hose is deployed shall be covered with a vinyl cover and shall be fastened by an elastic shock cord sewn into the tarp with brass grommets where the shock cord passes through the hose bed cover. When opened, the tread plate cover shall rest upon rubber bumpers or an equivalent type protective to eliminate marring or scratching on the cab.

The crosslay hose bed side covers shall be red in color.

The crossly cover shall have a cut handhold incorporated for lifting and lowering the cover.

CROSSLAY ROLLERS

Stainless steel hose roller guides shall be installed at the openings on each side of the crosslay hose bed area. The rollers shall aid in hose deployment and reduce the chaffing of the hose jacket on the edges of the bay area.

DECK GUN MONITOR WATERWAY

There shall be one (1) deck gun monitor waterway installed on the apparatus as specified:

- A 3" Elkhart Brass Unibody valve model EB30G1F handwheel actuated control with stainless steel ball and dual self-adjusting polymer seats. The handwheel will be set so that when closed the handle is at 6 o'clock.
- The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance. The valve shall be operated using a 50:1 gear drive actuator. The actuator shall be quickly adjustable to one of four positions and require 12 revolutions from full open to full close.
- The waterway shall be plumbed with 3" piping that terminates 3" above the top of the pump compartment unless otherwise specified or required by a specific deck gun selection as noted.
- The plumbing shall be drained with an auto-drain located at the lowest point of the waterway plumbing if required.
- There will be a dealer supplied Task Force Tips 18" Extend-a-Gun and Hurricane monitor installed on the deluge pipe. There will be position sensors mounted for the monitor and saddle bracket and wired to the cab "Door Open" indicator light that will notify occupants when not in the stowed position.

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

The deluge pipe shall be located up through the pump compartment, centered from left to right.

BOOSTER HOSE REEL to Match

There shall be one (1) Hannay Model EF electric rewind booster reel (model EF28-25-26) with automatic brake installed on the apparatus. The reel shall have a maximium capacity of 200' of 800 psi booster hose. The reel shall be plumbed to the pump with a 1.5" quarter turn Elkhart ball valve and 1.5" high pressure hose and couplings with no drain. The valve shall be controlled from the operator's panel.

- There shall be a manual rewind device provided that faces the rear of the vehicle. A manual crank shall be mounted adjacent to booster reel.
- Each hose reel specified shall be non-polished aluminum.
- The hose reel shall be mounted to the far left side on the rear wall of the rear center compartment, adjacent to the tailboard.
- An electric rewind switch shall be located adjacent to the booster reel in the right upper corner on the wall. The switch shall have a weather resistant rubber cover and label denoting its function.
- There will be two (2) stainless steel hose roller guides installed one (1) on either side of the compartment door opening to allow hose deployment without rubbing the apparatus.

A “No Shok” 2 1/2" liquid filled gauge shall be supplied for the discharge pressure reading of 0-400 psi.

BOOSTER HOSE

The reel shall come equipped with 200 feet of 1" diameter booster hose, 800 psi. The hose shall be provided in 100 foot lengths with hardcoat aluminum couplings.

TANK TO PUMP LINE

The connection between the tank and the pump shall be capable of the flow recommendations as set forth in NFPA Pamphlet 1901, latest revision and shall be tested to those standards when the pump is being certified. One (1) non-collapsible flexible hose(s) and valve(s) shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. Four (4) inch stainless steel schedule 10 piping may be used to complete the connection from the tank to pump valve to the water tank.

A 3" Elkhart Brass Unibody valve model EB30. The valve will be open when "in" and closed when "out". There will be a label that states "Pull to Close".

The valve shall be controlled from the side operator's panel.

TANK TO PUMP CHECK VALVE

There shall be a tank to pump check valve, conforming to NFPA standard requirements, which shall be of bronze construction. The check valve shall be mounted as an integral part of the pump suction extension.

TANK FILL LINE

One (1) 2" tank fill/recirculating line shall be installed from the pump directly to the booster tank.
A 2" Elkhart Brass Unibody valve model EB20 with stainless steel ball and dual self-adjusting polymer seats.

The valve shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall

not require lubrication of seats or other internal waterway components, and will be capable of swinging out of the waterway for maintenance.

The valve shall be controlled from the side operator's panel.

***Space Frame Body* - ALUMINUM**

Stainless steel may be offered in addition to aluminum for manufacture of the body and cab components. The apparatus body could be a space frame design, which could serve as the structural skeleton of the body. This framework acts as a series of beams and columns that support and protect the body and its contents. The space frame design provides maximum torsional resistance and load capabilities. The entire space frame structure shall be welded together utilizing an A.W.S. Certified welding procedure. NO EXCEPTIONS.

The space frame design shall also be required because it provides energy absorbing impact zones in the structure, thus providing increased safety to the rest of the apparatus and personnel on board. Documented proof of this extra safety shall be required upon request.

The Tri-Max body structure shall consist entirely of closed section members, except where the body is mounted to the chassis. Closed section members (such as square, rectangular, triangular, or round tubes) are required because they provide maximum strength and torsion rigidity. This style of design ultimately reduces fatigue and shall add longevity to the body structure. Body designs that use independent sub-frames shall not be acceptable.

Body Structure Members: The space frame body shall have triangular shaped structural members in certain areas of the body. This shape is required to prevent loss of useable compartment space. Other body structure members shall be square or rectangular. Each structural member will have a nominal outside dimension of 2.5” in at least one direction. The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members varies from .125 to .250 throughout, dependent on the design requirement.

Body Material Type: All body structural members shall be Aluminum 6061-T6 alloy material. All .188 sheet material shall be Aluminum Alloy 5052-H32 and .250 sheet materials shall be Aluminum Alloy 3003. These alloys are required because it provides optimum all-around performance for strength, manufacturing properties, and corrosion resistance.

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor.

Front Body Compartment Walls: The front compartment walls of both forward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments.

Rear Body Compartment Walls: The rear compartment walls of both rearward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments. Access panels from the rear walls shall be strategically placed to ensure access to the rear taillight clusters for any servicing that may be completed.

Compartment Top: The top of the compartments shall be an integral portion of the body. No overlay material shall be visible from the interior of the compartments.

Compartment Floors: The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a 1” lip downward at the door opening side of the

compartment. This lip shall integrate with a structural member on the bottom edge and form a "sweep-out" compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

Compartment Load Capacity: Each compartment shall have a minimum of one additional structural compartment floor support centered on the underside of the compartment floor. This additional member shall be integral with the rest of the body structure. Each compartment must be designed, and 3rd party analyzed to carry a working load of:

Full depth side compartment: 1,000 lbs per compartment
Half depth side compartment: 750 lbs per compartment
Rear center compartment: 1,500 lbs per compartment
NO EXCEPTIONS

Exterior Hose Bed Walls: The exterior hose bed walls shall be an integral portion of the body. The wall shall give a smooth exterior look and finish with no vertical supports tubing visible from the exterior of the truck.

Finite Element Analysis: The proposed body design must have completed a review and analysis by a legitimate 3rd party engineering firm. At a minimum, the 3rd party must have conducted a computer model finite element analysis of the proposed design. The analysis is to include real world working load scenarios. Analysis to cover both static and dynamic situations must be completed. The purpose of the finite element analysis is to ensure proper design of the apparatus body, and that it is capable of carrying the typical fire apparatus loads and those specified by NFPA for equipment. The analysis process must conclude that the body structure is properly designed and manufactured to provide longevity under normal conditions. The 3rd party must also validate the manufacturing processes are consistent with the design and analysis performed. Proof of having completed this testing must be submitted with the proposal. NO EXCEPTIONS.

SIDE RUB RAILS (CHANNEL)

The lower edge of the apparatus shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel material.

The rub rails shall be secured with stainless steel hardware and shall be spaced away from the apparatus body with ½" nylon spacers, to help prevent the collection of water and debris. The rub rail sections shall be easily removable.

REAR RUB RAILS (CHANNEL)

The rearward edge of the rear step shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel material.

The rub rails shall be secured with stainless steel hardware and shall be spaced away from the apparatus body with ½" nylon spacers, to help prevent the collection of water and debris. The rub rail sections shall be easily removable.

RUB RAIL REFLECTIVE STRIPING

One inch reflective striping (3M Diamond Grade) shall be applied to the length of each rub rail section making the perimeter of the apparatus more readily visible. The reflective striping shall be red in color.

CPI BUMPER CORNER COVERS

Two Cast Products Bumper Corner Covers model (#BC0001) and brightly polished, will be provided on the rear of the body.

REAR TAILBOARD

The rear tailboard shall be fabricated of the same tubular materials as used in the apparatus body. The tailboard shall be an independent assembly welded to the rear body structural framing to provide body protection and a solid rear stepping platform. The rear step shall be designed to incorporate "crush zone" technology. This idea incorporates lighter materials in the tailboard than the body structure so the step will "crush" in a collision before the body structure.

The rear of the apparatus body shall be vertical in design - otherwise known as a 'flat-back'. On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901).

The removable rear tailboard shall be minimum of nineteen 19 inches deep and shall incorporate a ventilated "Diamondback" material stepping surface bolted in place which spans the full width of the apparatus on non-recess designs, and as wide as possible on inset recess designs. The extruded stepping surface shall be completely enclosed by the supporting structural framework to minimize damage and shall have beveled corners.

The ventilated "Diamondback" material shall be capable of being easily replaced if necessary, using only hand tools. The framework shall be covered with an adhesive tape providing an aggressive traction surface. Use of any aluminum diamond plate material on these areas shall not be acceptable.

FOLDING STEPS

Each surface of the folding step shall have grip material with a minimum of 42 sq. inches in size. Each step shall be capable of sustaining a 500 lb. static load. The steps shall be manufactured by Austin Hardware model #FS-200CHR.

The following steps shall be installed:

- Two (2) folding steps shall be installed on the right side pump compartment area on the back of the custom cab. These steps shall be utilized to access the water tank fill tower of the apparatus. The steps shall also be utilized to gain access to the top of the pump compartment structure and any equipment located in the immediate vicinity. There shall be a Whelen model #0AC0EDCR LED step light with 45 deg. mounting bezel provided and installed with the apparatus. The light shall be directed towards and positioned above the stepping surface.

- There shall be a total quantity of two (2). One (1) 10" long x 1 1/4" diameter handrail constructed of 3-piece knurled aluminum tubing shall be installed at the top of the cab line horizontally above the forward steps to assist in climbing the steps according to NFPA 1901. There shall be a 2" minimum clearance between the bracket and the body.

- One (1) folding step shall be installed on the right rear vertical face of the body. There shall be a Whelen model #0AC0EDCR LED step light with 45 deg. mounting bezel provided and installed with the apparatus. The light shall be directed towards and positioned above the rearward stepping surface. One (1) 10″ long x 1 ¼″ diameter handrail constructed of knurled 3-piece aluminum tubing shall be installed on the hose bed wall from the beavertail to the top above the rearward step to assist in climbing the steps according to NFPA 1901. There shall be a 2" minimum clearance between the bracket and the body.

- Two (2) folding steps shall be installed on the left rear vertical face of the body. There shall be two (2) Whelen model #0AC0EDCR LED step lights with 45 deg. mounting bezel provided and installed with the apparatus. The light shall be directed towards and positioned above the rearward stepping surface. One (1) 10″ long x 1 ¼″ diameter handrail constructed of knurled 3-piece aluminum tubing shall be installed on the hose bed wall from the beavertail to the top above the rearward steps to assist in climbing the steps according to NFPA 1901. There shall be a 2" minimum clearance between the bracket and the body.

PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts. Alternate corrosion protection may be considered.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish. Alternatives will be considered.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyiscoyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturer’s recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the proposal.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Material Data Safety Sheet".

The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of

inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications.

Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials). BMS 10-72A (Boeing Material Specifications).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body, will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects. The coating will meet the following test performance properties as a minimum standard.

BODY PAINT COLOR

The apparatus body shall be painted PPG 926236 red or equivalent matching paint.

BED-LINER COMPARTMENT FINISH

The compartment interiors shall be coated with bed-liner. The color shall be medium gray.

GENERAL BODY DETAILS

All compartmentation shall be constructed in a sweep out design to be water and dust resistant, and manufactured to the maximum possible storage capacity.

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. The Manufacturer may be requested to supply evidence of fastener coating and results of salt spray testing when dissimilar metals are used. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

WHEEL WELLS

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

WHEEL WELL MODULES

The body wheel well area shall be fabricated of 3/16" smooth aluminum and finish painted. There shall be “smart storage” compartmentation features incorporated on each side of the apparatus body wheel well modules to utilize and maximize storage space availability. The smart storage compartment doors shall be painted 3/16" Aluminum. There will be no screws protruding from the outside of the painted door. Stainless steel may be offered as part of a stainless body.

WHEEL WELL ROLL-OUT DRAWER

There shall be a roll-out drawer installed above the rear wheel on the left side of the body behind the L2 compartment door. The drawer shall be approximately 23.5" deep by 59" wide and have a 250 lb. capacity with lift bar assembly.

WHEEL WELL ROLL-OUT DRAWER

There shall be a roll-out drawer installed above the rear wheel on the right side of the body behind the R2 compartment door. The drawer shall be approximately 23.5" deep by 59" wide and have a 250 lb. capacity with integrated lift bar assembly.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold three (3) one-hour SCBA bottles with 1" nylon safety loops installed. The compartment shall be located in front of the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold one (1) one-hour SCBA bottle with 1" nylon safety loops installed. The compartment shall be located behind the axle on the left side.

FIRE EXTINGUISHER STORAGE COMPARTMENT

There shall be a compartment located in the wheel well for storage of one (1) 2.5 gallon water extinguisher and one (1) 20 lb. ABC fire extinguisher. The compartment shall be located in front of the axle on the right side. Compartment sizes are verified at pre-construction.

FIRE EXTINGUISHER COMPARTMENT

There shall be a compartment located in the wheel well for storage of one (1) 15 lb. CO2 extinguisher and fuel fill. The compartment shall be located behind the axle on the right side.

STORAGE DOOR OPEN INDICATORS

Each smart storage compartment door shall have a “black magnet” style switch.

If the door is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew.

COMPARTMENTATION

The following compartments shall be supplied on the apparatus:

There will be one (1) left (L1) and right (R1) front compartment installed ahead of the rear axle. Each compartment will have one (1) roll-up compartment door. The interior compartment dimensions will be approximately 43.5"W x 74"H x 25.5"D in the lower and 12.5"D in the upper. The compartment will have a useable door opening of approximately 38"W x 65"H.

There will be one (1) left over wheel (L2) and right over wheel (R2) compartment installed over each wheel well. Each compartment will have one (1) roll-up compartment door. The interior compartment

will be approximately 62"W x 45.5"H x 12.5"D. The compartment will have a useable door opening of approximately 59"W x 35"H.

There will be one (1) left rear (L3) and right rear (R3) compartment installed behind the rear axle. Each compartment will have one (1) roll-up compartment door. The interior dimensions will be approximately 55.5"W x 74"H x 25.5"D in the lower and 12.5"D in the upper. The compartment will have a useable door opening of approximately 50"W x 65"H

There will be one (1) center rear compartment installed at the rear of the apparatus. The compartment will have NO DOOR and have a useable door opening of approximately 38"W x 29"H. which is 34.5"D from the rear. There shall be a 2.5" drain hole installed in the left front corner of the compartment.

There shall be a removable compartment installed in B1 above the booster reel. The compartment shall have a Chevron covered drop down door. The door shall be supported on both sides and not deflect under normal conditions. The compartment shall be removable for service to the booster reel.

COMPARTMENT VENTILATION

To allow for proper air circulation & flow, each compartment shall have a venting route. The venting locations shall be determined by best-fit for each body configuration. The vents will be chrome louvered plate and installed appropriately on the compartment interior walls.

SIDE COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed in apparatus body "SIDE" compartments, to accommodate the installation of shelves, trays, tool boards and or other miscellaneous equipment. There will be no Unistrut in the upper L1 or L3.

REAR COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed on the rear wall of the rear center compartment on the apparatus body, to accommodate mounting of accessories.

REAR COMPARTMENT PARTITIONS

The rear center compartment of the apparatus shall have permanent partitions installed to increase utilization of the rear center area and to block access to either of the side compartments. The partitions shall be constructed of the same materials as used in the body structure and shall be welded in place to form permanent compartmentation.

DOOR CONSTRUCTION

All horizontal and vertical side compartment doors shall be roll-up style doors.

ROBINSON ROLL-UP DOORS

The Robinson door is a preferred brand. The door slats shall be of a double wall box frame extrusion. Exterior surface shall be flat and the interior surface shall be concave to prevent loose equipment from jamming the door. The slats will be anodized to prevent oxidation and there shall be inner-locking end shoes on every slat, secured by a punch and dimple process. The slats shall have interlocking joints with a folding locking flange. There shall be a PVC/Vinyl inner seal between each slat to prevent metal to metal contact.

The track shall be of a one piece aluminum design with an attaching flange and finishing flange incorporated into its design to facilitate installation and provide a pleasing finished look without additional trim or caulking. The track shall have a replaceable side seal to resist water and dust intrusion into the compartment.

The drip rail shall be fabricated of aluminum and have a built in replaceable wiper seal. The Roll-up door shall have a 4" diameter counterbalance, to assist in lifting while eliminating the risk of accidental closing. The door shall be secured by a full width lift bar, operational by one hand with heavy gloves. The securing method will be of a positive latch device design.

SIDE COMPARTMENT DOORS/TRACK/TRIM/WET PAINTED

The side compartment roll up doors, track and trim shall be wet finish painted to color match the apparatus body.

ROLL-UP DOOR PROTECTORS

There shall be a protective cover installed under each body compartment door roll to protect the door in the rolled up position.

Each cover shall be fabricated of smooth aluminum and of natural finish.

SIDE ROLL-UP DOOR ASSIST STRAPS

There shall be nylon straps installed on both left and right body side 'high side' compartment doors, to assist in closing the door. The strap shall be attached to each door and shall be permanently mounted to the rearward wall with footman loops using nutzerts, half way between the top and bottom of the compartment.

DOOR OPEN INDICATOR

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the bar is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew.

SILL PLATES

Mirrored stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

HOSE STORAGE

A hose bed shall be provided and installed with a minimum of thirty (30) cubic feet of storage space available. The hose bed shall have a slotted 1/4" aluminum flooring installed to allow drainage through the tank cavity to the ground below.

The aluminum flooring shall be manufactured in discrete sections to allow for ease of removal and stability. The area shall be free of sharp edges to protect the hose when loading and unloading.

The walls of the hose bed shall be 80" tall, measured from the bottom edge of the compartments to the

top flange.

'A' FRAME HOSE BED COVER

There shall be a double door cover furnished and installed which overlays a tubular structure for the hose bed.

Each cover shall be capable of supporting 600 lbs while standing on the cover. Each cover shall be capable of being opened independently and rest on a tubular structure which runs down the middle of the hose bed with a truss support at the rear of the apparatus. The covers in the closed position shall be higher in the center of the hose bed than they are at the hinged end to create an 'A' frame appearance and to aid in water run-off.

The front and rear of hose bed covers shall have vertical end caps that extend down to create a level line of diamond plate the width of the covers. The rear of the hose bed shall have a folding vinyl flap that is held in place by an elastic shock cord.

The doors shall be fabricated of .125" embossed aluminum diamond plate with full length two-piece stainless steel piano hinges.

The hose bed cover shall be wired to the open door warning light in the chassis cab with sensors at the hinges to warn the crew when the cover is open when the transmission is placed into drive or reverse movement mode.

The aluminum covers shall be full length of the hosebed and shall cover the fill towers with a hinged cover over the fill tower. Alternative “one-man” operational hose bed covers will be considered whether air actuated or not.

The hose bed covers shall be supplied with two (2) pneumatically actuated cylinders, to assist in lifting and lowering the hosebed covers.

The pneumatic actuation device shall allow adjustment of the rate of speed for lift or lowering. The cylinders shall be equipped with low temperature seals, to extend operation down to -40 degrees Fahrenheit.

To aid in opening and closing the covers, there shall be a single black paddle style switch that will open both covers at the same time.

The rear flap shall be dealer supplied

ON SCENE "Night Stick" HOSE BED COVER LIGHTING

Two (2) "Night Stick" LED strip light shall be mounted to the underside of each hose bed cover. The lights shall be on a circuit and turning on only when the covers are opened. The light shall be manufactured by On Scene Solutions.

HOSE BED AREA TRIMMED W/ MIRRORED SST

The vertical corners along the back of the hose bed shall be trimmed with mirrored stainless steel. The trim shall extend from the hose floor level up to the top edge of the body side.

The top rail on the hose bed side walls shall have a trim cap fabricated of mirrored stainless steel. The cap shall run the entire length of the hose bed side wall and shall provide a smooth surface with a highly finished appearance. It shall extend down at least 1” on each side of the hose bed side wall.

HOSE BED AREA

The hose bed area of the apparatus shall be overlaid with dull aluminum material.

The hose bed shall accommodate 1000' of 5" hose, 300' of 3" hose, and 400' of 2.5" hose.

REINFORCED HOSEBED DIVIDER

There shall be two (2) reinforced single piece hosebed divider provided and installed in the hosebed area of the apparatus body.

The divider shall be fabricated of 1/4" thick aluminum plate with a double sided reinforcement and attached to the adjustable slide rails. The rear of the divider shall have a radius to provide a smooth corner and a hand cut out to aid in access to the hose bed area. The top and rear edges shall be reinforced with 1” round aluminum tubing for extra rigidity. Hose payout shall be unobstructed by the divider.

The dimensions between the dividers will be provided by the FD

NO HOSE BED DUNNAGE AREA

The rear face of the forward body wall shall serve as a mounting surface for the hose bed dividers, resulting in the ability to move any hose bed divider across the entire width of the hosebed. No dunnage area shall be provided in the hose bed.

FENDERETTES

Two (2) polished stainless steel fenderettes shall be provided and installed on body rear wheel well openings, one (1) each side. Rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to resist deterioration.

UPF POLYPROPYLENE TANK

The booster tank shall be constructed of 1/2" thick PT2ETM poly sheet stock which is a non-corrosive stress relieved thermoplastic, natural in color, and UV stabilized for maximum protection. It shall be designed to be completely independent of the body and compartments. All joints and seams are nitrogen welded and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy tank removal. The transverse swash partitions shall be manufactured of 3/8" PT2ETM poly (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2ETM poly (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

Cover:
The tank cover shall be constructed of 1/2" thick PT2ETM poly, natural in color, and UV stabilized, to incorporate a multi three-piece locking design which allows for individual removal and inspection if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" poly dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.

Mounting:
The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with, a minimum thickness and width dimensions of .250" x 2" and a minimum Rockwell Hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both, front and rear as well as side to side to prevent the tank from shifting during vehicle operation.

A picture frame type cradle mount shall be utilized with a minimum of 2" x 2" x .250 mild steel, stainless steel or aluminum angle. Where aluminum or steel tubing and channel sub-frames are incorporated in the body structure, the use of corner angles having a minimum dimension of 4" x 4" x .250 x 6" high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x .250 and shall be approximately 6 to 12 inches long. These brackets must incorporate a hard rubber isolating pad with a minimum thickness of .250 inch affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank. Internal mounting block design and hose bed floors must also be designed so that the floor slat supports extend full width from side wall to side shall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Hose floor loading must support up to 200 lbs per square foot and must be evenly distributed whenever possible. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

Fill Tower:
Fill opening shall be approximately 13" x 12". The tower will have a 1/4" thick removable polyprene screen and a polyprene hinged type cover that will open if the tank is filled at an excess rate. There shall be a removable 1/4" thick polyprene screen to prevent debris from falling into the tank. The fill tower shall have a 4" overflow that will discharge underneath the tank, behind the rear wheels. The overflow shall terminate above the tank water level when filled to the rated capacity. The fill tower shall be located in the left front hose bed.

Sump:
The sump will be constructed of 1/2" polyprene and be located inline with the tank suction valve. There shall be a 4" schedule 40 polyprene tube installed that will run from the suction outlet to the sump location. The tank will have an anti-swirl plate located approximately 2" above the sump.
The sump shall have a 3" plug for use in draining and cleaning out the tank.

Outlets:
In addition to the tank suction valve outlet located in the sump, there shall be an outlet provided for the tank fill valve. If there are any additional options selected (such as an extra tank suction or direct tank inlets), there shall be additional outlets provided to accommodate these items.

TANK CAPACITY

The tank shall be 500 gallons in capacity.

TANK LEVEL GAUGE

A Fire Research TankVision model WLA200-A00 tank indicator kit shall be installed on the apparatus. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

In addition, there will be two (2) blue LED Whelen ION lights on the sides of the operator panels. They will be wired to activate at the 1/4 tank level and be mounted in the upper panel area between the body and backboard storage. This light shall be labeled "LOW WATER TANK LEVEL"

ENCLOSED LADDER STORAGE

Ladders will be mounted in a compartment located beside the booster tank. There shall be a double walled constructed hinged door, matching the rear overlay material and painted, on the rear of the compartment with one (1) D-ring slam latch to secure the contents inside. The door shall be switched to the "Open Door Indicator Light" in the cab to alert the driver if the door is not closed.

The compartment shall be located on the right side of the tank, with the ladders lying on their side.

The compartment shall be enclosed through the tank to the pumphouse, and incorporate a removable weather resistant end cap, providing access for serviceability, drainage and cleaning.

The compartment shall be large enough for one (1) 10' aluminum Alco-Lite attic ladder, one (1) 14 foot aluminum Alco-Lite roof ladder, one (1) 24 foot two section Alco-Lite aluminum extension ladder, two (2) pike poles to be stowed in individual divided slots, so one item may be removed without disturbing

the others. Each slot shall have a plastic angle installed at the top and bottom to guide the ladders. There shall be a stop in the front of each compartment to prevent the items from sliding forward. The pike pole holders should be able to double as “NY hook” holders as well.

SUCTION HOSE STORAGE

A rack sized to hold 6 inch x 10 foot hose constructed of anodized aluminum for a durable, long lasting finish shall be provided and located as follows:

- One (1) located on the left side above the apparatus compartments.
- hard suction should be black in color

OVER-WHEEL COMPARTMENT PARTITIONS

Compartment partitions, fabricated of the same material as the body, shall be welded in place in over-wheel compartments flush to the forward and rearward frame openings on the right side.

These partitions shall aid in keeping loose equipment from falling into the fore and aft compartments.

SHELVING

The shelf shall be fabricated of .190 thick aluminum sheet material with the outside and inside edges flanged up to prevent equipment from sliding off. The shelf shall be as wide as possible to allow proper attachment to uni-strut channels. The shelf shall be adjustable up and down. The following shall be provided:

- A {12.5”} deep shelf shall be supplied and installed in the compartment. The shelf shall be as wide as possible and there shall be a total quantity of eight (8).
    - One (1) located in the L-1 compartment.
    - One (1) located in the L-2 compartment.
    - One (1) located in the L-3 compartment.
    - Two (2) located in the R-1 compartment.
    - One (1) located in the R-2 compartment.
    - Two (2) located in the R-3 compartment. One (1) will be skinnier as it is mounted on unistrut on the node cover.
- A {25.5”} deep shelf shall be supplied and installed in the compartment. The shelf shall be as wide as possible and there shall be a total quantity of three (3).
    - One (1) located in the L-1 compartment.
    - Two (2) located in the L-3 compartment.

AUSTIN HARDWARE / ROLL OUT TRAY

The tray shall be fabricated of 3/16" thick 3003 grade or higher aluminum with four 3” side flanges; corner welded for maximum strength. The tray shall be as wide and deep as the door allows and secured to (Austin Hardware) “heavy duty” slide assemblies.

The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a lock-in, lock-out (FDR) front drawer release system. The following shall be provided:

- A {300#} capacity tray with {100%} extension shall be installed to the compartment floor. There shall be a total quantity of one (1).
    - One (1) located in the L-1 compartment.
- A {300#} capacity tray with {100%} extension and adjustable height utilizing uni-strut materials shall be installed. There shall be a total quantity of one (1).
    - One (1) located in the R-1 compartment.

WALL MOUNTED TOOL BOARD/PAC-TRAC

A Pac Trac tool board shall be installed to the back wall of the compartment as specified. The completed tool board assembly, shall be attached directly to the wall ultilizing custom maufactured plate or angle brackets.

- One (1) located in the L-1 compartment.
- One (1) located in the L-2 compartment.
- One (1) located in the R-2 compartment.

HOSE BED STORAGE AREA

There will be a hose bed storage area running on top of the ladder box. It will be enclosed on each side and the bottom but open to the top when the hose bed cover is opened. There will be a divider 72” from the rear of the body. This area should be deep enough to hold several standard foam container.

The compartment shall be incorporated behind a seperate ladder box compartment door. The door shall be a box pan style door made of treadplate.

STORAGE COMPARTMENT

There shall be a free standing, permanently mounted, rescue equipment storage compartment provided and installed with the apparatus. The compartment shall be constructed of 1/8" smooth aluminum and allow access from either side if mounted in a transverse designed section. The interior floor of the compartment shall be lined with black ABS plastic for ease of stowing and un-stowing equipment. The compartment shall include provisions for mounting the following:

- Two (2) backboards shall be stored in a single storage slot integrated into the pump house to the rear of the crosslay's.

The compartment shall have a hinged door on each side to access equipment. The doors shall be fabricated with .125 aluminum diamond plate and shall be hinged on the cab side and secured with two (2) push button latches. The door latches shall secure the closed door by utilizing the pump box structure and not the use of tabs to catch the latches. The door shall have rubber bumpers on the outside of the door. The door shall be switched to the “Open Door Indicator Light” in the cab to alert the driver if the door is open.

O2 STORAGE MODULE

There shall be a cavity in the R1 compartment mounted on the bottom of the permanent mounted tray. This cavity shall hold (2) Oxygen bottles with a divider between the bottles.

The compartment shall have a hinged door to access equipment. The door shall be fabricated with .125 aluminum and shall be secured with one (1) push button latch.

OVERLAYS

The entire front face of the apparatus body shall have aluminum diamond plate overlays installed.

The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

The front of the apparatus body, vertical wall overlay shall be integrated with a 1/8” aluminum diamond plate corner trim pieces for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The rear face of the apparatus body, vertical wall overlays shall be installed with a 1/8” aluminum diamond plate 1.0” x 1.0” corner trim piece, for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The vertical edge trim piece that is protecting the chevron striping surface or that is utilized for the purpose of striping, shall be secured utilizing fasteners only.

Stainless steel replaces aluminum when stainless bodies are quoted.

CATWALKS

The catwalks shall be constructed with materials of a non-slip embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

GUSSETED REAR STEP / PLATFORM

The rear step shall be approx. six (6) inches in depth and shall span the entire width of the hose bed. The step shall be constructed of embossed diamond plate material. The step shall be mounted on the flat back of the apparatus at the end of the hose bed with gusset-type mounting to provide sufficient support for loading hose and gaining access to the hose bed area. The step shall be constructed of a grip material meeting the latest recommendations of NFPA 1901. Handholds shall be cut into the rear step to assist in climbing on apparatus rear.

There will be a 54” wide OnScene Solutions “Night Stik” LED light under the rear intermediate step. The light shall illuminate with Pump Engaged and/or Pump panel light switch and in the LCD

KNURLED 3-PIECE ALUMINUM HANDRAIL SPECIFICATIONS

All handrails shall be 1 1/4" in diameter, constructed of knurled 3-piece aluminum tubing. There shall be a 2" minimum clearance between the bracket and the body.

The following handrails shall be installed at the approximate lengths noted:

- There will be two (2) handrails, one (1) each side.

TOW EYES

There shall be two rear tow eyes installed to the frame rails, one each side, accessible below the rear center compartment. They shall be manufactured of 1" plate steel and each plate shall be bolted to the chassis frame rail with a minimum quantity of (6) grade 8 bolts. The two plates shall be anchored together with 1" steel tubing to prevent swaying of the frame rails during a towing operation.

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Logic Controlled, Low-Voltage (12v) Electrical System, compliant with the latest revision of the NFPA 1901 standard guidelines.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (similar to operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or system modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as extra harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and an apparatus-specific reference of I/O shall be furnished in the final delivery manuals. These drawings shall illustrate the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus manufacturer shall not be accepted.

NODE

An electrical distribution node or relay shall be located as high as possible on the interior of the rearward most rear compartments on each side of the apparatus body.

Full depth body compartmentation designs shall have the node mounted to the rear frame wall that is perpendicular to the chassis frame rails.

Half depth compartmentation designs shall have the node mounted to the rear frame wall that is perpendicular to the chassis frame rails.

A protective cover shall be installed to prevent damage to the node or electrical system during equipment installation and or removal. Node covers shall be approximately 16 to 22” in length and shall match the compartments interior finish. Node covers will not include any type of shelve mounting structure and shall limit the height of uni-strut or shelf height within the compartments.

LED DOT LIGHTING

There shall be a total of eleven (11) red clearance lights and two (2) amber clearance lights on the apparatus. There shall be seven (7) red clearance lights located on the rear of the apparatus, two (2)

lights shall be in the rear rub rail as wide as possible and five (5) lights shall be as high as possible. On the sides of the apparatus there shall be four (4) red clearance lights, two (2) located on each side of the apparatus in the rub rails at the front and rear portion of the rear compartments. Additionally on the sides of the apparatus there shall be two (2) amber clearance lights, one (1) located on each side of the apparatus in the rub rail at the rear portion of front compartments.

There shall be four (4) amber intermediate turn signals located on the sides of the apparatus. They shall be located two (2) on each side of the apparatus in the rub rail, one (1) at the front of front compartments and one (1) at the front of the pump compartment. The turn signals will steady burn when not blinking.

The lights shall be Weldon OS series LED red and amber markers.

LED REAR TAIL LIGHT WARNING CLUSTER

There shall be a Whelen M6-Series Super LED Quad-Cluster, rear tail light cluster provided and installed in individual polished bezels on the rear of the apparatus, one each side. The cluster shall consist of the following specified components:

1 - 4X6 spot for the warning lamp specified below
1 - Whelen #M6BTT LED red brake light
1 - Whelen #M6 BUW LED clear backup light
1 - Whelen #M6T LED series amber turn signal light

BACKUP LIGHTS

The backup lights , as well as the rear scene lights, shall illuminate when the apparatus is placed in reverse.

PUMP/TRANSVERSE COMPARTMENT LIGHTING

There shall be one (1) 36" OnScene Solutions "Night Stik" LED light provided and installed with the apparatus. The light shall be mounted and switched at the light with a weather resistant toggle switch.

COMPARTMENT LIGHTING

OnScene "Night Stick" LED strip lighting shall be installed in the compartments as specified. The lighting in each compartment shall be on a separate circuit, and only illuminate when the compartment doors are open. Each light will have a 6" pigtail and be mounted using five (5) retaining clips.

- Two (2) "Night Stick" LED strip lights shall be installed in two (2) over wheel compartment(s).
- Two (2) "Night Stick" LED strip lights shall be installed in four (4) full height compartment(s).
- One (1) "Night Stick" LED strip light shall be installed in the rear center compartment.

PERIMETER LIGHTS

There shall be twelve (12) LED underbody perimeter lights provided and installed with the chassis lights being pre-wired.

On the chassis there will be one light under each cab door. On the body there will be one (1) light under L1/R1/L3/R3 and each side of the tailboard. There will be two under the front bumper.

They shall be manufactured by OnScene Solutions and be 18" "Night Stik" LEDs.

UPPER LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

ZONE C: There shall be two (2) Whelen model L31HRFN beacons with 360 degree LED lights and clear lenses, provided and installed on the apparatus. One (1) each side on the rear upper outboard corners of the apparatus. In addition there shall be two (2) Whelen model M6RC 4"x6" flashing red LED lights with clear lenses and chrome bezels, provided and installed under the upper rear scene lights. One (1) on each side of the apparatus connected with spade connectors and set to flash pattern 92. The upper ZONE C specified lights shall be mounted directly to the horizontal body surface as far rearward as possible.

LOWER LED WARNING LIGHTING

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

ZONES B&D: There shall be two (2) Whelen model ION flashing red LED lights with clear lenses and chrome bezels, provided and installed at the rear most area of the rub rail and shall be recessed in the rub rail. One (1) on each side of the apparatus.

ZONE C: There shall be two (2) Whelen model M6RC 4"x6" flashing red LED lights with clear lenses and chrome bezels, provided and installed on the rear of the body.

ADDITIONAL WARNING LIGHTS

In addition to the NFPA warning light package, there shall be four (4) Whelen ION red LED lights with clear lenses installed two (2) each side. One (1) shall be installed in front and one (1) behind the rear axle on the upper body sides. These four (4) lights shall be installed in the upper section of the side compartment header centered above the compartments.

In addition to the NFPA warning light package, there shall be four (4) Whelen ION red LED lights with clear lenses installed two (2) each side. One (1) shall be installed below the front compartments (L1/R1).

In addition to the NFPA warning light package, there shall be four (4) Whelen ION red LED lights with clear lenses installed two (2) each side. One (1) shall be installed in front and one (1) behind the rear axle on the lower body sides. These four (4) lights shall be installed in the rear fender (wheel well) area of the body.

REAR DIRECTIONAL LIGHT BAR

There shall be eight (8) rear directional lights furnished and mounted on the rear of the apparatus integrated to the rear face of hosebed cover vertical end cap.

The lights shall be Whelen model ION LED amber lights with clear lenses and chrome bezels and mounted equally spaced, four (4) lights on each end cap.

The back of the hose bed cap shall be boxed in to provide protection and strength for the lights. The

back of the protection panel shall be angled to provide protection when hose is deployed in case of contact. This protection panel shall be constructed of embossed aluminum diamond plate.

The lights shall be controlled by a Whelen TACTLD1 control head located in the upper center of the center switch panel.

REAR VIEW CAMERA SYSTEM

A chassis supplied camera shall be surface mounted on the center rear of the apparatus body below the rear hose bed step for maximum viewing capability. It will have cable that is encased in flexible conduit with 90 degree fittings.

12 VOLT SCENE LIGHTS

There shall be a Whelen model #M6ZC 12 volt gradient scene light with chrome bezel provided and installed with the apparatus as specified:

- There shall be a total quantity of two (2).
- The scene lights shall be located on the rear of the body, one (1) each side.
- The scene lights shall be activated through the multiplexing LCD display and when placing the transmission into reverse. The lights will deactivate when the transmission is placed into drive but can be manually re-activated afterwards.

TELESCOPING LIGHTS

There shall be a Whelen Pioneer model #PFP2P, LED dual lamp, 12volt, side mounted, bottom raise, telescoping scene light installed on the apparatus as specified below:

- There shall be a total quantity of two (2).
- The light pole shall have a friction type lock to hold the pole in the extended position.
- The scene light pole(s) shall have a "up" indicator switch to indicate that the light is in a raised position.
- The scene light outside pole(s) shall be knurled providing a non-slip grab handle surface.
- Two (2) lights shall be mounted on the front face of the apparatus body. When nested the ligths will be able to be turned to the side.
- The scene lights shall be activated through the multiplexing LCD display and by a switch on the pump panel.
- The stanchion offset from the body needs to be verified by the HFD.

REFLECTIVE STRIPING

The reflective striping shall be supplied and installed by the dealer.

RETROREFLECTIVE CHEVRON STRIPING

There shall be diamond grade retroreflective chevron striping applied prior to applying the accessories on the rear of the apparatus. The retroreflective chevron striping shall be red and yellow in color.

LICENSE PLATE MOUNTING

A Cast Products, model LP0004-1-B, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate a clear LED light (WL0501) to illuminate the license plate and

meet DOT requirements.

GROUND LADDERS

One (1) Alco-Lite 24' two (2) section aluminum extension ladder(s), model PEL-24.
One (1) Alco-Lite 14' aluminum roof ladder(s) with folding hooks, model PRL-14.
One (1) Alco-Lite 10' aluminum attic ladder(s), model FL-10.

HOSE

All hose must meet the current requirements of NFPA 1961.

All hose is to be stamped or laser engraved with "HFD", numbered with the year purchased and an individual hose number. Hose identification will use the following format of the department's initials, the year of purchase in a two-digit format, and a 3 to 4 digit individual hose number, i.e. "HFD 14-001". The numbers will be supplied by the Houston Fire Department Warehouse Supervisor.

Hose, 5 inch Rubber covered large diameter hose (LDH) with Storz full time swivel couplings with locks, in the following lengths; 15′, 25′, 50′ and 100′. All 100′ sections of hose will have a 4″ black stripe (or contrasting color) at the 50′ portion of the hose. Hose collar will have a 45 degree angle bevel to avoid hanging up in hose beds. 5″ LDH will have a service test pressure of 225 PSI.

All adapters and fittings will have a hardened anodized coating and laser engraved with "Houston FD".

Adapters and fittings for 5″ Storz hose are to be provided in the following types;

6″ female, rocker lug to 5″ Storz with locks, 30 degree elbow

5″ Storz with locks X 4″ female swivel, rocker lug Houston thread (5.070)

5″ Storz with locks X 4″ male Houston thread (5.070)

5″ Storz with locks X 2 ½″ female swivel, rocker lug National hose thread

5″ Storz with locks X 2 ½″ male National hose thread

4″ female swivel, rocker lug Houston thread (5.070) X 5″ Storz with locks, 30 degree elbow

SUPPLIED/INSTALLED EQUIPMENT

1	EA	LETTERING	CUSTOM LETTERING / STRIPING TO MATCH EXISTING UNITS
1	EA	FHU-RH-6	NEW YORK ROOF HOOK 6′
4	EA	KS34	SPANNER/HYDRANT WRENCH SET
1	EA	NUP-YPD-8	8' YPD PIKE POLE (36208)
1	EA	NUP-YPDH-3	3' YPD PIKE POLE (36103)
2	EA	ZSKE56R-L	KOCHEK 6″F swivel,rocker lug x 5″ storz w/locks 30 elbow
2	EA	ZS54R54-L	5″ Storz w/locks x 4″F Swivel, rocker lug Hou Thread 5.070
20	EA	RC5078	KOCHEK 5”x100” Rubber cover SUPPLY HOSE W/ Storz Connections, hose shall have a 4” wide black stripe (contrasting color) at the 50’ mark.
1	EA	RC5078-2	KOCHEK 5″ Storz x 5″ Storz Rubber Cover supply hose 25′
1	EA	RC5078-3	KOCHEK 5″ Storz x 5″ Storz Rubber Cover supply hose 15′
2	EA	ZS36S54-L	5″ Storz w/locks x 4″M Houston Thread 5.070
2	EA	ZS54S525-L	5″ Storz w/locks x 2 ½″ F Swivel, rocker lug NST
2	EA	Z36S525-L	5″ Storz w/locks x 2 ½″ M NST
1	EA	ZS54L54-L	5″ Storz w/locks x 4″ F swivel, long handle Houston Thread
1	EA	ZSKE54R-L	4″ F swivel, rocker lug, Houston Thread (5.070)x 5″ Storz w/locks, 30 degree elbow
1	EA	ZCC507	5″ Storz cap with chain
1	EA		6″ x 10′ Hard Suction
4	EA	SL-44451	FIRE VULCAN FLASHLIGHT, LED,
2	EA	K08	STORZ SPANNER WRENCH
1	EA	TFT-XFIF-PLNJ	HURRICANE MONITOR 1250 GPM
1	EA	TFT-XGB-33	BRKT SET 3
1	EA	TFT-XG18VL-PL	EXGUN 18
1	EA	TFT-X-SENSOR-KIT	KIT INCLUDES: SENSOR, CRADLE,

1	EA	TFT-XF-SS5	STREAM SHAPER 5
1	EA	TFT-MST-4NJ	4 STACKED TIPS 2.5

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # B-2

CITY OF HOUSTON FIRE DEPARTMENT

AERIAL LADDER SPECIFICATION

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) SOLICITATION NO.: S58-T25507
AERIAL LADDER SPECIFICATIONS - ATTACHMENT # B-2

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter and as specified with a view of obtaining the best results and the most acceptable apparatus for service in the Department. These specifications shall cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful vendor must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction for all features. Apparatus proposed by the vendor shall meet the requirements of the National Fire Protection Association (NFPA) as stated in current Pamphlet 1901 for Aerial Ladder & Elevated Platform Fire Apparatus, chapters 1, 2, 6, 8, 9, 10, 11, 16, and 23, except where amended herein. Loose equipment shall be provided only as stated in the following pages.

Proposals shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of twenty-five years.

Each vendor shall provide satisfactory evidence of their ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. They shall also show that they are in a position to render prompt service and to furnish replacements parts on said apparatus.

Because of the severe service requirements the department will impose on this apparatus, each vendor shall provide a list of at least six (6) departments serving populations of over 250,000 in which similar apparatus utilizing the brand of chassis proposed have been in service for over one year. This list shall include contact names and phone numbers.

Each proposal shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus being furnished under contract shall conform.

Note: Each vendor shall submit their proposal in the same sequence as these specifications, to allow the department to easily compare multiple proposals.

QUALITY AND WORKMANSHIP

The design of the Apparatus shall embody the latest approved automotive engineering practices. The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points:

Accessibility of the various units, which require periodic maintenance; and ease of operation and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off road requirements and to speed conditions as set forth under Performance tests and requirements. Welding shall be

employed in the assembly of the apparatus in a manner that will not prevent the ready removal of any component part for service or repair.

All steel welding shall follow (American Welding Society) requirements for AWS D1.6:1999 Structural Welding Code for welding stainless steel structural assemblies. All aluminum welding shall follow (American Welding Society) requirements for AWS D1.2/D1.2M:2003 Structural Welding Code for any type structure made from aluminum structural alloys. All sheet metal welding shall follow (American Welding Society) AWS D9.1M/D9.1:2006 Structural Welding code for Arc/Braze requirements of non-structural materials.

All pressure pipe welding shall follow (American Society of Mechanical Engineers) ASME IX/ASME B31:2010 requirements to the qualification of procedures in welding and brazing, in accordance with the ASME Boiler and Pressure Vessel Code and the ASME B31 Code for Pressure Piping. Flux core arc welding to use alloy rods, type 7000, (American Welding Society) AWS standards A5.20-E70T1. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during testing operations within working hours to monitor weld quality.

Employees classified as welders shall be tested and certified to meet American Welding Society and American Society of Mechanical Engineers welding codes.

DELIVERY

To insure proper break-in of all components while still under warranty, the apparatus shall be delivered under its own power, rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and instruct the Fire Department personnel in the proper operation, care and maintenance of the equipment delivered.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded to its estimated in-service weight and shall be capable of the following performance while on dry paved roads that are in good condition and for a continuous run of ten (10) miles or more, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful vendor shall provide a Weight Certificate showing weights on front axle, rear axles and total weight for the completed apparatus at time of delivery.

The apparatus shall be capable of accelerating to 35 MPH (55 km/hr.) from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.

- The apparatus shall be capable of accelerating to 35 MPH (55 km/hr.) from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.
- The apparatus, fully loaded, shall be capable of obtaining a minimum top speed of 50 MPH (80 km/hr.) on a level dry concrete highway with the engine not exceeding its governed RPM (fully loaded).

- The service brakes shall be capable of stopping a fully loaded vehicle in 35ft (10.7 m) at 20 mph (32.2 km/hr.) on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.
- The apparatus, when fully loaded, shall have not less than 25 percent or more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.

If optioned, the apparatus shall be tested and approved by the Underwriter's Laboratories Incorporated in accordance with their standard practices for pumping engines. The contractor shall provide copies of the Pump Manufacturer's Certification of hydrostatic test, the Engine Manufacturer current certified brake horsepower curve, and the Manufacturer's record of pumper construction details when delivered. If optioned, the vendor, at their expense, shall have the Underwriter's Laboratories Incorporated conduct the tests required by the Underwriter Laboratories Incorporated (Guide for the Certification of Fire Department Pumper subject 822 dated 1995 or latest). A copy of all tests shall accompany the Apparatus. (For apparatus sold within Canadian ULC S515 / latest revision.)

INFORMATION REQUIRED

The manufacturer shall supply at time of delivery, a complete operation and maintenance manual covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment to specify the quantity and type of the following fluids used in the vehicle: Engine oil, engine coolant, and chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used) and drive axle lubrication fluid.

The manufacturer shall supply the final certification of GVWR and GAWR on a nameplate affixed to the vehicle.

A permanent plate in the driver's compartment shall be installed, specifying the seating capacity of the enclosed cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" shall be provided and will be visible from each seated position. An accident prevention sign shall be located at the rear step area of the apparatus. It shall warn all personnel that standing on the step while apparatus is in motion shall be prohibited.

LIABILITY

The vendor, if their proposal is accepted, shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

SPECIFICATION REQUIREMENTS

Item compliance shall be indicated in the “Yes/No” column of each item by all vendors.
Vendors shall submit a detailed proposal. Each vendor shall submit their proposals in the same arrangement as these specifications for ease of evaluation, comparison, and examination of compliance. Proposal communications by letter only and/or written on a company letterhead, shall not be acceptable.

EXCEPTIONS TO SPECIFICATIONS

The following specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that as specified and providing they are listed and entirely explained on a separate page entitled "Exceptions to Specifications". The exceptions list shall refer to specification page number and paragraph.

Proposals taking total exception to specifications or total exception to certain parts of the specifications will not be acceptable. The Apparatus shall be inspected upon completion for compliance with specifications. Deviations will not be tolerated and will be cause for rejection of Apparatus unless they were originally listed in vendor's proposal and accepted in writing by the department.

If the vendor takes an exception, on the exception page, the vendor must state an option price to bring their specifications into full compliance with the Department specifications. Failure to provide this information shall be cause to reject the proposal as being non-responsive. An exception to these requirements shall not be tolerated.

PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all proposals as it deemed in their best interests.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment and a full complement of personnel will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Agency.

The apparatus shall be designed so that the operator could perform all recommended daily maintenance checks easily without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These components must not be welded or otherwise permanently secured into place.

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, unequipped personnel weight, ground ladders, and a miscellaneous equipment allowance per NFPA criteria. It shall be the responsibility of the purchaser to provide the contractor with the weight of equipment to be carried if it is in excess of the allowance as set forth by NFPA.

The unequipped personnel weight shall be calculated at 250 lbs. per person times the maximum number of persons to ride on the apparatus. The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 7 percent.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Where special tools manufactured or designed by the contractor and are required to provide routine service on any component of the apparatus built or supplied by the contractor, such tools shall be provided with the apparatus.

PROPOSAL DRAWINGS

For purposes of evaluation, the vendor shall provide a drawing illustrating, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus and other specified equipment, shall be required to be included with the vendor's proposal package.

The drawings shall be large "D" size (minimum 24" x 36"). Smaller size drawings, "similar to" drawings or general sales drawings, shall not be acceptable. Failure to provide a proposal evaluation drawing in accordance with these specifications shall be cause for rejection of the proposal.

APPROVAL/PRE-CON DRAWINGS

After the award of the contract, the vendor shall provide detailed colored engineering drawings including, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus for use of pre-construction conference. The drawings shall include, but shall not be limited to the right, left, top, front and rear views of the apparatus. The Customer will sign the final approval drawing.

One (1) electronic copy (PDF) and four (4) printed "D" size drawings will be provided.

SINGLE SOURCE MANUFACTURER

Quotes shall only be accepted from a single source apparatus manufacturer.

The definition of single source manufacturer is company that designs and manufactures their products utilizing an approach that includes complete product integration, including the apparatus chassis, cab, and body modules being constructed, assembled, and tested on company premises only.

Warranties qualified to the chassis and body design construction (excluding vender component warranties such as engine, axles, transmission, and pumps, etc.) will be from a single source manufacturer and not separated between manufacturers (i.e. body and chassis). The vendor shall provide evidence of maintaining compliance to this requirement.

SUPPLIED INFORMATION & EXTRAS

The apparatus manufacturer shall supply two (2) copies of apparatus manuals with all manufactured apparatus one (1) printed and one (1) CD. The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacturer can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, the manufacturer shall also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other recommendations for care and upkeep of the general apparatus.

The manufacturer shall also supply a manufacturer's record of apparatus construction details, including the following information:

Owner name and address:

Apparatus manufacturer, model, and serial number:

Chassis make, model, and serial number:

GAWR of front and rear axles:

Front tire size and total rated capacity in pounds:

Rear tire size and total rated capacity in pounds:

Chassis weight distribution in pounds with manufacturer mounted equipment (front and rear):

Engine make, model, serial number, rated horsepower, related speed and no load governed speed:

Type of fuel and fuel tank capacity:

Electrical system voltage and alternator output in amps:

Battery make and model, capacity in CCA:

Paint numbers:

Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (without personnel, equipment, and Written load analysis and results of the electrical system performance tests:

Transmission make, model, and type:

Pump to drive through the transmission (yes or no):

Engine to pump gear ratio and transmission gear ratio used:

The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed:

The certification of inspection and test for the aerial device:

All the technical information required for inspections to comply with NFPA 1914, Standard for Testing Fire Department Aerial Devices:

COLOR CODED ELECTRICAL SCHEMATICS

The apparatus manufacturer shall supply one (1) set(s) as-built wiring schematics, to include all line voltage schematics with each apparatus. Two (2) printed and one (1) CD.

GENERAL WARRANTY

A warranty shall be offered for each new fire apparatus manufactured for a period of Two (2) years from the date of delivery, except for the commercial chassis and certain other components as noted in the next paragraph.

In the case of a commercial chassis being used, the warranty on the chassis, engine, transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities.

STRUCTURAL WARRANTY

A structural Aluminum warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

PAINT WARRANTY

A ten (10) year Prorated Paint Warranty shall be included with the apparatus.

MULTI-PLEXED ELECTRICAL WARRANTY

If equipped, A four (4) year limited multiplex system warranty shall be provided by the apparatus manufacture for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation.

APPARATUS TEST BY UNDERWRITERS LABORATORIES

The following Apparatus shall comply with all NFPA 1901 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by the contractor and Underwriters Laboratories when the apparatus has been completed. The manufacturer shall furnish the completed Test Certificate(s) to the purchaser at time of delivery.

Since the inspection services of Underwriters Laboratories are available to all vendors on an equal basis, no other third party testing service shall be acceptable.

The tests conducted on the apparatus shall include, but not be limited to the following.

12-VOLT ELECTRICAL TEST

The apparatus low voltage electrical system shall be tested and certified.

The Houston Fire Department will be notified three (3) weeks in advance of the UL tests so that if desired, they can attend.

FACTORY PRECONSTRUCTION CONFERENCE

The factory authorized Distributor shall be required, prior to manufacturing, to have a preconstruction conference at the manufacturing facility with a factory representative present and Four (4) individuals from the Houston Fire Department to finalize all construction details. The number of HFD individuals attending the preconstruction conference can be increased or decreased upon agreement of both the vendor and the HFD.

The Factory Authorized Distributor shall, at their expense, provide transportation, lodging, and meals.

Any distance greater than 200 miles shall be by commercial air travel unless another form of transportation is agreed upon by the vendor/distributor and the HFD.

MID INSPECTION CONFERENCE

The Factory Authorized Distributor shall be required, during manufacturing, to have an aerial/pre-paint inspection conference at the site of the manufacturing facility with at least 3 (three) individuals from the Houston Fire Department to inspect the apparatus during construction. The "Purchaser" shall designate the stage of construction at which the visit will be conducted.

The Factory Authorized Distributor shall, at their expense, provide transportation, lodging, and meals.
Any distance greater than 200 miles shall be by commercial air travel unless another form of transportation is agreed upon by the vendor/distributor and the HFD.

FINAL INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a final completion inspection conference at the site of the manufacturing facility with 3 (three) individuals from the Houston Fire Department to inspect the apparatus after construction.

The Factory Authorized Distributor shall, at their expense, provide transportation, lodging, and meals.Any distance greater than 200 miles shall be by commercial air travel unless another form of transportation is agreed upon by the vendor/distributor and the HFD.

ON-LINE CUSTOMER INTERACTION

The manufacturer shall provide the capability for online access through the manufacturer's website. The customer shall be able to view digital photos of their apparatus in the specified phases of construction. The following phases will be captured and displayed on the manufacturer's website:

1. Driver, Officer and Crew Chassis- Front, Left, and Right
2. Body – Prior to Paint – Left, Right, Rear, Top
3. Body – Painted –Left, Right, Rear, Top
4. Assembly – 80% Complete- Left, Right, Rear, Top
5. Any view reasonably requested by the HFD

Due to the complex nature of fire apparatus and the importance of communication between the manufacturer and customer, this line item is considered a critical requirement. NO EXCEPTION

MAXIMUM OVERALL WIDTH

The apparatus specified shall be constructed as detailed and shall be a minimum of Ninety- Six (96") inches and NOT exceed a Maximum Overall Width of One Hundred (100") inches.

This dimension shall include the primary construction of the apparatus body and chassis cab.

Any peripherals that are 'removable' shall not be incorporated into this measurement.

Items that are considered 'removable' are: Rub Rails, Fender-ettes, Mirrors, Lights, Handrails, Front Bumpers, Etc.

MAXIMUM WHEEL BASE REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum wheel base.

MAXIMUM OVERALL LENGTH REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum overall length.

MAXIMUM OVERALL HEIGHT REQUIREMENT

The apparatus specified shall be constructed as detailed and shall NOT exceed a maximum overall height of Eleven Feet, Eleven Inches (11'11") or 143 inches.

HIGH WATER PERFORMANCE REQUIREMENT

The Apparatus specified shall meet or exceed the following performance requirements while operating in 40" of water. In order to achieve this requirement, all vents and other openings in

construction or mechanical/electrical components shall be mounted above the 40" mark and must be sealed.

VEHICLE STABILITY (CG) CALCULATION OR MEASUREMENT CERTIFICATION

Vehicle stability or roll stability shall be presented by methods of calculations or measurements per NFPA 1901 – current edition. The calculated or measured center of gravity (CG) shall be no higher than 80 percent of the rear axle track width.

The OEM shall utilize supplied documents and information detailing specific equipment and locations for purposes of calculating CG. If no such information is supplied the OEM shall estimate approximate equipment loads based upon the vehicle configuration for such calculations in correspondence with NFPA 1901 required loadings.

Upon acceptance of the vehicle, a signed OEM written certification shall be supplied with the fire apparatus before delivery.

MODEL

The chassis shall be the manufacturer's Premium Custom Medium/Long Extended Four-Door cab model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects the current model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of The United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis.

APPARATUS TYPE

The apparatus shall be an aerial vehicle designed for emergency service use. The apparatus shall be equipped with a ladder, elevating platform or water tower that shall be rear mounted thus providing the following vehicle benefits:

• Improved mobility vs. mid-ship mounted units, due to shorter overall travel length and wheelbase.
• Increased compartment space resulting from the ladder being raised to clear the cab.
•Shorter vehicle wheelbase.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab.
The chassis of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer.
This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer.
This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

CAB STYLE

The cab shall be a custom, fully enclosed, extended medium/long four door model with a raised roof of at least 8" over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle.

This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate.

The exterior width of the cab shall be a minimum of 96.00 inches wide and a maximum of 100.00 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be at a minimum 136.00 inches with 60.00 inches from the centerline of the front of the axle to the back of the cab. Deviations must be approved by the HFD. The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 55.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface. Any deviations must be approved by the HFD.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of approx. 40 inches wide X 53 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of approx. 32 inches wide X 61 inches high, from the cab floor to the top of the door opening. Any deviations must be approved by the HFD.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely. Any deviation must be approved by the HFD.

The first step for the driver and officer area shall measure approximately 11.25 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.38 inches deep X 32.13 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches. The first step for the crew area shall measure approximately 10.38 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.20 inches deep X 21.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches. Any deviations to these dimensions must be approved by the HFD.

OCCUPANT PROTECTION

The vehicle shall include a passenger safety system (PSS) which shall secure belted occupants and increase the survivable space within the cab. The PSS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the PSS shall also provide ejection mitigation protection.

The system components shall include:

• Driver steering wheel airbag

• Officer knee airbag.
• Large driver, officer, and crew area side curtain airbags
• PSS seat belt system -retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
• Heavy truck Restraints Control Module (RCM) -receives inputs from the outboard sensors, selectively deploys PSS systems, and records sensory inputs immediately before and during a detected qualifying event
• Integrated outboard crash sensors mounted at the perimeter of the vehicle -detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
• Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the restraint control electronics. In a qualifying front impact event the outboard sensors provide inputs to the restraint control electronics. The restraint control electronics activate the steering wheel airbag, driver side knee airbags, officer side knee airbag, and advanced seat belts for each occupant, in the cab.

The PSS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95th percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The PSS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, approx. 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating

a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front cab fascia shall include a classic box style grille with deviations approved by the HFD. The grille shall include a minimum free air intake that meets the minimum requirements of the engine manufacturer. If available, the grille will include a unit designation, i.e. “83”.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint or alternative approved by the HFD.

CAB PAINT COLOR

The paint color shall be PPG FBCH 926236 red or alternative approved by the HFD.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occur first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with dark red non or low gloss spray on bed liner product which shall mold to each surface of the cab interior. The liner shall be environmentally friendly and chemically resistant.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate. Any deviations must be approved by the HFD.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

CAB ENTRY DOOR TYPE

All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately 32.00 inches of clearance from the ground to the bottom of the door so cab doors may be opened un-hindered by most obstacles encountered, such as guard rails along interstate highways.

CAB INSULATION

The cab ceiling and walls shall include approximately 1 (one) inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LEFT HAND EXTERIOR MID EMS COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the left side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

RIGHT HAND EXTERIOR MID EMS COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab 'B' pillar to the standard rear door location above the right side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

CAB ROOF TRENCH

The center section of the raised roof shall include an approximately 50.00 inch wide by 10.00 inch deep trench to accommodate the aerial device.

CAB STRUCTURAL WARRANTY

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon or equivalent brand of multiplexing system, suppressed per SAE J551. The 12V system breaker and relay panel shall be located as close to the windshield as possible. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a current Vista-style display which shall be located on the left side of the dash in the switch panel. The Vista-style display shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista-style display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

All warranties will be listed in the Vista-style display. Individual manufacturer deviations of these items can be pre-approved by the HFD.

DATA RECORDING SYSTEM

The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

AUXILIARY ACCESSORY POWER

An auxiliary six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed behind the switch panel. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

ADDITIONAL ACCESSORY POWER

An additional six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed on the side wall of the engine tunnel behind the officer's seat. The fuse panel shall be protected by a 40 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTRA ACCESSORY POWER

An extra six (6) position Blue Sea Systems 5025 blade type or equivalent or equivalent fuse panel shall be provided and coiled loose on the floor at the center of the rear wall of the cab with four (4) feet of additional wiring. The fuse panel shall be protected by a 60 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 60 amp battery direct load. Final mounting in this area to be determined by the HFD.

ANCILLARY ACCESSORY POWER

One (1) ancillary six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed behind the officer’s seat. The fuse panel shall be protected by a 100 amp fuse located at the batteries. The fuse panel shall be capable of carrying up to a maximum 100amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ENGINE

The chassis engine shall be a Cummins ISX15 engine. The ISX15 engine shall be an in-linesix (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 500 horse power at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1850 foot pounds of torque at 1200 RPM with 912 cubic inches (14.9 liter) of displacement.

The ISX15 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA

certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of approx. 0.19 of an inch thick aluminum alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 inches high, unless approved by HFD.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista-style display and control screen for the high idle speed control.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

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

AUXILIARY ENGINE BRAKE

A compression brake for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when an ABS event occurs. The engine compression

brake shall activate upon 0% acceleration when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

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

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

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

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The engine oil, coolant, transmission, and power steering fluid fills shall be located under the cab. The windshield washer fill shall be accessible through the mid step of the side in which it is installed.

ENGINE DRAIN PLUG

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

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall be direct drive belt driven on the engine.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer's requirements.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris.

ENGINE COOLANT

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

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

COOLANT HOSES

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE AIR INTAKE FILTER AND RESTRICTION WITH REPLACEABLE ELEMENT

The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the right hand side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the right hand side. The system shall utilize a replaceable dry type

filter which ensures dust and debris remains safely contained inside the housing during operation via leak-tight seals. The service cover shall be located on the bottom of the housing, eliminating the chance of contaminating the air intake system during air filter service.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter element, which shall result in pressure differential for improved horsepower and fuel economy. The air intake ember separator shall be mounted within easy access via a hinged panel behind the right hand side headlight module. The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF. The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall be mounted below the frame in the inboard position with the SCR canister in line rearward of the DPF.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

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

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

ENGINE EXHAUST ACCESSORIES

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

ENGINE EXHAUST WRAP

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

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
Rev	4.80:1

TRANSMISSION MODE PROGRAMMING

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

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 227 vocational packages in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission

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

Function ID Description Wire assignment
Inputs

C PTO Request 143

F Aux. Function Range Inhibit (Special) 101/142

Outputs

G PTO Enable Output (See Input Function C) 130

S Neutral Indicator for PTO 145

Signal Return 103

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION RETARDER CONTROL

The Allison transmission retarder control shall be 100% modulated by brake pedal actuation and shall include a virtual button on the Vista-style display and control screen. The activation of the retarder shall activate the brake lights and shall be inactive during pump mode.

TRANSMISSION RETARDER CAPACITY LEVEL

The transmission retarder shall be programmed so the maximum retardation shall be at the high capacity level.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

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

TRANSMISSION COOLING SYSTEM

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

TRANSMISSION DRAIN PLUG

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

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

POWER TAKE-OFF (PTO)

A ten (10) bolt standard duty clutched drive PTO shall be installed on the transmission.
Installation shall include mounting of the PTO and wiring the unit with a control switch.

PTO MODEL

A ten (10) bolt Chelsea model 277-XGFJP-B5RA heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides torque ranges from 250 to 335 lb. ft.

PTO LOCATION

The transmission driven power take off (PTO) shall be mounted in the 8:00 o'clock position.

PTO PROGRAMMING

The power take off shall be programmed for operator control such that it shall only engage at or below 900 RPM and operate in a range up to 4000 RPM. The PTO programming shall provide for automatic disengagement set at a specified engine speed of 4000 RPM which shall protect equipment driven from the power take off.

PTO CONTROL

The left hand power take off shall be controlled by the transmission. It will use a virtual button on the Vista-style display and control screen with text messages. Disable is displayed when switch is off. Enable is displayed when the switch is turned on. Active is displayed when the switch is on with positive engagement of the power take off.

Required operating conditions for enabling this function are:

• Throttle position is low

• Engine speed is within customer modifiable constant limits
• Output speed is within customer modifiable constant limits

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat® or Glide Coat equivalent.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor S3238 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and a see through cover to allow visual inspection of fuel and filter condition. The Racor S3238 shall be a 10 micron filter capable of handling a maximum flow rate of 150 gallons per hour.

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

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

The fuel shutoff valves will be labeled in a way so that the end user will not confuse them with any other valves on the apparatus.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL COOLER

Aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

FUEL TANK

The fuel tank shall have a capacity of approx. sixty-five (65) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw. The vent shall include a three (3) feet long vent hose to allow for the vent to be mounted so the end of the vent line is at least forty (40) inches from the ground. The final routing of the vent hose shall be determined by the OEM.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

A 1.50 inch diameter hole shall be provided in the left and right frame rails for vent hose routing provisions. The holes shall be located adjacent to the fuel tank and 5.13 inches up from the bottom of each rail.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL FILL LOCATIONS

Fuel fill locations will be located on the right and left sides of the body for easy fueling at a retail fuel facility.

FRONT AXLE

The front axle shall include an independent front suspension (IFS) system offering superior ride and improved handling.

FRONT AXLE WARRANTY

The front axle shall be warranted by the manufacturer for three (3) years or 150,000 miles, whichever comes first.

FRONT WHEEL BEARING LUBRICATION

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

FRONT SHOCK ABSORBERS

Two (2) Bilstein, or equal, inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system.

FRONT SUSPENSION

The chassis shall include an independent front suspension (IFS) system. The known advantages of IFS systems are improved handling and better braking due to the increase in tire surface to ground contact area. The suspension travel of the IFS shall be approximately 6.50 inches, providing 3.00 inches bounce and 3.50 inches rebound of the suspension. The IFS front axle shall be rated between 21,000 and 24,000 pounds.

Alternative IFS systems can be considered by the HFD.

STEERING COLUMN/ WHEEL

The cab shall include a steering column which shall include a multi-position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

POWER STEERING PUMP

The hydraulic power steering pump shall be a Vickers 20V and shall be gear driven from the engine. The pump shall be a fixed displacement vane type. The power steering fluid shall be synthetic ATF Transynd and have a pour point of -67 degrees Fahrenheit (-55ºC).

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

FRONT AXLE CRAMP ANGLE

The chassis shall have a maximum front axle cramp angle of 55-degrees to the left and right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85/RCS 85 or equivalent.

CHASSIS ALIGNMENT

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

REAR AXLE

The rear axle shall be a Meritor model RT-52-185 tandem drive axle or equivalent. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 54,000 pounds.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock which shall allow both axles to be engaged as drive axles. The inter-axle differential lock shall be controlled by a virtual button on the Vista-style display and control screen. The Vista display shall indicate when positive engagement of the inter-axle differential lock has occurred.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 60 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The tandem rear axle shall feature a Ridewell Dynalastic RD202 with accordion style elastomer springs. The suspension shall incorporate a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement. The rear tandem suspension shall include 54.00 inch axle centers.

The rear tandem suspension capacity shall be rated at 54,000 pounds.

REAR SHOCK ABSORBERS

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

SUSPENSION CONTROLS

The front suspension shall incorporate an air retention system which shall activate when the park brake is engaged. The air retention system shall retain air in the front suspension air bags when the chassis is raised off the ground by the aerial outriggers. There shall be an indicator light on the driver's panel to indicate low pressure in the air retention system.

FRONT TIRES

The front tires shall be Goodyear 445/65R-22.5 20PR "L" tubeless radial G296 MSA mixed service tread.

The front tire stamped load capacity shall be 24,600 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating load capacity shall be 26,320 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch. The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRES

The rear tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G661 HSA mixed services tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

REAR AXLE RATIO

The rear axle ratio shall be 5.38:1.

TIRE PRESSURE INDICATORS

There shall be a pop up style tire pressure indicator installed at each tire valve stem. The indicator shall provide visual indication of pressure in the specific tire. Brand and model will be determined by HFD at pre-construction meeting.

FRONT WHEELS

The front wheels shall be Alcoa hub piloted, 22.50 inch X 13.00 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and a polished finish that lasts.

REAR WHEELS

The outer rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with LvL One™ bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be Real Wheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a total of 6220 cubic inch of air capacity. A Meritor-Wabco floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. A Meritor-Wabco inversion valve shall be installed to provide a service brake application with no primary air supply. All air reservoirs provided on the chassis shall be labeled for identification.

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

A six (6) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel.

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

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

A virtual style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

FRONT BRAKES

The front brakes shall be Knorr/Bremse SN7 disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.

PARK BRAKE

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

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

PARK BRAKE CONTROL

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

The parking brake actuation valve shall be mounted in the switch panel. A guard shall be installed over the parking brake control to prevent accidental application or release.

REAR BRAKE SLACK ADJUSTERS

Gunite rear brake automatic slack adjusters shall be installed on the axle.

AIR DRYER

The brake system shall include a Bendix AD-9 fully self-contained air dryer which shall not require an extra purge tank or additional valves. The AD-9 system shall include a spin-off desiccant filter with a 12-volt, 75-watt thermostatically controlled heating element. The air dryer shall feature 3.9 pounds of premium, high crush strength desiccant which shall be produced with a composition that shall be more effective and longer lasting than other desiccants. It shall also offer protection against contamination and desiccant breakdown. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the independent front suspension axle.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a 2084 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non- service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Manual cable actuated drain valves shall be installed on all reservoirs of the air supply system. The actuation pull cables shall be coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with black textile braid covered high tensile steel reinforced wire braided hose with steel reusable fittings. All drop hoses shall be fiber reinforced neoprene covered hose.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE

The chassis wheelbase shall be approximately 251.00 inches.

REAR OVERHANG

The chassis rear overhang shall be approximately 135.50 inches.

FRAME

The frame shall consist of triple side rails and cross members forming a ladder style frame.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

FRAME PAINT

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.

REAR MUD FLAP

The unit shall be equipped with a temporary wooden fender and mud flap assembly for transport to the body manufacturer if required.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 104.50 inches wide with angled front corners. The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

FRONT BUMPER EXTENSION FRAME WIDTH

The front bumper extension frame shall feature an overall width of approx. 48.25 inches.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER APRON

The 21.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep.

MECHANICAL SIREN LOCATION

The siren shall be pedestal mounted on the bumper apron on the inboard section of the bumper on the driver side. The siren shall be mounted far enough rearward as to not extend beyond the face of the bumper.

AIR HORN

The chassis shall include two (2) Grover brand Stutter Tone air horns which shall measure 24.50 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

AIR HORN RESERVOIR

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

The bumper shall include two (2) Whelen Engineering Inc. model SA314A, 100 watt speakers which shall be recess mounted within the bumper fascia. Each speaker shall have a natural cast aluminum finish and shall be installed using a polished aluminum trim ring.

ELECTRONIC SIREN SPEAKER LOCATION

The two (2) electronic siren speakers shall be located on the front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty chrome plated tow hooks shall be installed below the front bumper, forward position and bolted directly to the outside of each chassis frame rail with grade 8 bolts.

FRONT LICENSE PROVISION

The bumper shall include four (4) mounting holes to allow for a license plate to be installed by the OEM or end user. The mounting holes shall be drilled and tapped for ¼-20 threaded bolts.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the rear surface of the right hand side battery box. The pump shall be plumbed with 25.00 feet of additional length in the hoses so that the pump can be relocated by the apparatus manufacturer.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB TILT LOCK DOWN INDICATOR

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

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

CAB WINDSHIELD

The cab windshield shall have a surface area of approximately 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility. Single piece designs can also be considered.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self-locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window which is approximately 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window which shall measure approximately 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR RIGHT HAND

The rear right hand side crew door shall include a window which is approx. 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR LEFT HAND

The rear left hand side crew door shall include a window which is approx. 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

The cab shall include a minimum 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. The temperature and blower controls shall be located on the heater/air conditioning unit.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aeroquip GH 134 flexible hose with Aero-quip EZ clip fittings.

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit.

AIR CONDITIONER CONDENSER LOCATION

A roof mounted A/C condenser shall be installed in an approved location, TBD at preconstruction.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil. Multiple compressors are acceptable to power the overall system.

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal 6.00 inch air circulation fans installed on the center section of the ABS HVAC cover rearward of the windshield in line with the center map light. Each fan shall be controlled by an individual virtual button on the Vista-style display and control screen or a toggle switch on each fan. The fans shall automatically activate whenever the HVAC

is in defrost mode. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort

CAB CIRCULATION FANS MID

The cab shall be provided with two (2) individually switched all metal construction 6.00 inch fans. The fans shall be installed in the crew area just behind the front doors in the inboard positions.

Each fan shall be controlled by an individual virtual button on the Vista-style display and control screen or by manual switching on the fan itself. The multi-purpose fans can be used for air circulation or to help de-fog windows.

CAB INSULATION

The cab ceiling and walls shall include a minimum 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments. The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing, reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure 0.56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab and the insulation inside the tunnel shall have a removable aluminum overlay installed to protect the insulation and assist in retaining the insulation tight against the engine tunnel surfaces.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and Embossed

tread plate that shall wrap 2" horizontal and vertically. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM VINYL

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a customer specified interior paint or protective coating.

HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of approx. 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of approx. 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation.

TRIM LEFT HAND DASH

The left hand dash shall be constructed of approx. 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RIGHT HAND DASH

The right hand dash shall be constructed of approx. 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door. The glove compartment size will measure approx. 14.00 inches wide X 6.50 inches high X 6.00 inches deep. These dimensions can be altered if the box impedes the operation of the airbag safety system.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include one (1) 12 volt cigarette lighter-type receptacle in the dash as well as one (1) dual port USB receptacle to provide a power source for 12 volt electrical equipment and other electronics. The receptacles shall be wired battery direct.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of 14 gauge 304 stainless steel with indented perforations. The perforations shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 7 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick embossed aluminum tread plate.

STEP TRIM KICKPLATE

The cab steps shall include a kick plate in the rise of each step. The risers shall be trimmed in 3003-H22 bright aluminum tread-plate which is 0.07 inch thick.

UNDER CAB ACCESS DOOR

The cab shall include two (2) access doors, one in each of the left and right crew step risers constructed of embossed aluminum tread plate with a push and turn latch. The under cab access doors shall provide access to the diesel exhaust fluid fill and the battery box area under the cab.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

DOOR TRIM SCUFF PLATE

The trim along the door shall include a stainless steel scuff plate traveling along the door jamb and wrapping around from the interior to the exterior in an effort to prevent the chipping of paint should the seat belt buckle come in contact with the door jamb.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for The Houston Fire Department.

CAB DOOR TRIM REFLECTIVE

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior of each cab door.

INTERIOR GRAB HANDLES "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The handles shall assist personnel in entering and exiting the cab. If the handles cannot be placed in the "A" pillar due to airbag safety systems, an alternative place will be agreed upon by the vendor and the HFD at pre-construction.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR TRIM VINYL COLOR

The cab interior vinyl trim surfaces shall be black in color.

INTERIOR TRIM SUN VISOR

The header shall include two (2) 7.00 inches high X 18.00 inches wide impact resistant, transparent acrylic polycarbonate sun visors with a smoke gray tint shall be provided and installed on the header above the driver and officer.

The see thru visors are designed for maximum flexibility of positioning utilizing an arm with virtually unlimited adjustability with 13.50 inch long lateral travel of the tinted visor at the end of the arm which can be locked in place by a thumbscrew.

The visors are easily adjusted and can be placed into a chosen position with one hand. The sun visors will help protect vehicle occupants from solar glare without obscuring their vision.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

CAB PAINT INTERIOR

The inner door panel surfaces shall be coated with bed-liner dark red pebble-grain texture finish.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with bed-liner dark red pebble-grain texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with dark flat red bed-liner. Any accessory pods attached to the dash shall also be coated with this material.

TRIM LEFT HAND DASH INTERIOR PAINT

The left hand dash shall be coated with dark flat red bed-liner.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be coated with dark flat red bed-liner.

REAR WALL INTERIOR PAINT

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a protective coating of dark red bed-liner.

DASH PANEL GROUP

The main center dash area shall include three (3) aluminum removable panel's located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The panels shall be coated with a black texture finish. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include no rocker switches or legends.

SWITCHES LEFT PANEL

The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel and one (1) rocker switch located in the left hand side of the panel.

A rocker switch with a blank legend installed directly above shall be provided for this position if not designated by a specific option. The non-designated switch shall be a two-position, black switch with a green indicator light. The blank switch legend can be custom engraved by the body manufacturer. The switch legend shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include one (1) rocker switch position in the left hand lower corner of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switch shall be a two-position, black switch with a green indicator light. The blank switch legend can be custom engraved by the body manufacturer. The switch legend shall have red backlighting provided.

SEAT BELT WARNING

A Weldon (or similar) seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s) and a fast tone audible alarm. The wiring connections at each seat shall have heat shrink tubing applied so that the wiring cannot be easily disconnected to disable the system.

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

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear 1800.

SEAT COLOR

All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat backs shall include the logo for the Houston Fire Department of Houston, Texas. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four- way seat shall feature 3.00 inch vertical travel air suspension and manual fore and after adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semirigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous

forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Passenger Safety System (PSS). The PSS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the PSS shall also provide ejection mitigation protection. The driver's seating area PSS shall include:

• Advanced seat belt system -retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
• Large side curtain airbag -protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.
• Steering wheel airbag -protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semirigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat back shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer's seat shall offer a special mounting position which is 2.00 inches rearward of the standard location offering increased leg room for the occupant.

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with a Passenger Safety System (PSS). The PSS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. The officer's seating area PPS shall include:

• Advanced seat belt system -retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
• Large side curtain airbag -protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

• Knee airbag - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT FORWARD FACING OUTER LOCATION

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

SEAT CREW FORWARD FACING OUTER

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat back and cushion. The bottom cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location.

The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”. The minimum vertical dimension from the seat H- point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted inboard from the side wall for additional clearance facing the front of the cab.

FORWARD FACING OUTER LOCATION

The forward facing outer seat position(s) shall be equipped with a Passenger Safety System (PSS). The PSS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the PSS shall also provide ejection mitigation protection. Each forward facing outer seating position PSS shall include:

• Advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
• Side curtain airbag -protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include one (1) forward facing center crew seat located directly behind the engine tunnel in the center of the cab.

SEAT CREW FORWARD FACING CENTER

The crew area shall include a seat in the forward facing center position which shall be an H.O.Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The

seat belt assembly anchorages shall conform to the Federal Motor Vehicle Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

FORWARD FACING CENTER

The forward facing center seat position(s) shall be equipped with the Passenger Safety System (PSS). The PSS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the PSS shall also provide ejection mitigation protection.

Each forward facing center seating position PSS shall include:

• Advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

• Side curtain airbag -provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed style seat frame located and installed at the rear wall. The seat frame shall measure 62.38 inches wide X 8.63 inches high X 22.00 inches deep. The seat frame shall be constructed of approximately 0.19 inch thick aluminum plate. The forward corners of the bench shall be chamfered 45-degrees X 4.00 inches. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area one (1) each side of the seat frame.
Each access point shall be covered by a hinged door which measures approximately 15.00 inches wide X 6.88 inches high to allow access for storage in the seat box.

SEAT MOUNTING FORWARD FACING CENTER

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

CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

SEAT COMPARTMENT DOOR FINISH

All under seat storage compartment access doors shall have a protective coating of dark red bed-liner.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position. A single-piece windshield will require three (3) windshield wipers.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a key from the exterior. The door locks are designed to prevent accidental lock out.

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece knurled aluminum, anti-slip exterior assist handle, installed behind each cab entry door. The grab handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand. Each grab handle shall include a full height stainless steel scuff plate that shall extend from the top of the door to the bottom of the cab or the wheel well to help protect the cab paint from damage.

REARVIEW MIRRORS

Ramco model 6015-FFHR-750HR bus style mirrors shall be provided. The mirror heads shall be polished cast aluminum and shall measure 9.75 inches wide X 13.00 inches high with an additional top mount convex assembly. The mirrors shall be mounted one (1) on each front cab corner radius below the windshield with 15.00 inch long polished cast aluminum arms with 3" vertical risers.

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

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a virtual button on the Vista-style display and control screen.

EXTERIOR TRIM REAR CORNER

There shall be an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick on the outside corners at the back of the cab. The overlay shall wrap 1.00 inches forward on the sides of the cab and 12.00 inches inboard on the rear wall.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge, 304 polished stainless steel. The inner liner shall include a 45-degree by 7.25 inch chamfered edge, with rounded corners on the interior corners of the liner.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include one manufacturer emblem installed on the front air intake grille and one

(1) chassis emblem with an integrated model nameplate installed on the exterior of the cab on the lower forward portion of the front driver and officer side doors.

IGNITION

A master battery system with a keyless start ignition system shall be provided. A push type starter button shall be provided adjacent to the ignition switch.

Each switch shall illuminate when the respective switchis placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERIES

The single start electrical system shall include six (6) 1150 CCA batteries with a 205 minute reserve capacity each and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat shall be installed in the bottom of the trays to allow for

air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

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

BATTERY CONDITIONER

A Kussmaul 40 amp battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab in the area between the driver seat and the LH rear facing outer seat position.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be temporarily installed behind the officer's seat with 4.00 foot additional hose length. The air compressor shall be plumbed to the air brake system to maintain air pressure.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it’s connected to.

Amp Draw Reference List:

Kussmaul 1000 Charger - 3.5 Amps

Kussmaul 1200 Charger - 10 Amps

Kussmaul 35/10 Charger - 10 Amps

1000W Engine Heater - 8.33 Amps

1500W Engine Heater - 12.5 Amps

120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well in the forward position.

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner and the air pump.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a red cover.

HEADLIGHTS

The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the Vista-style display. There shall be a virtual dimmer control on the Vista-style display to adjust the brightness of the dash lights. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position.

GROUND LIGHTS

The vehicle shall include pre-wiring for incandescent NFPA compliant light heads with the light activation by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the Vista-style display and control screen.

STEP LIGHTS

The middle step located at each door shall include one (1) On-Scene brand Night Axe LED strip light which shall activate with the opening of the respective door. The step light shall be mounted in a polished aluminum bezel.

ENGINE COMPARTMENT LIGHT

There shall be two (2) LED NFPA compliant lights mounted under the engine tunnel for area work lighting on the engine. The lights shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The lights shall activate automatically when the cab is tilted.

INTERIOR OVERHEAD LIGHTS

The cab shall include a Tecniq E20-WC0R-1 LED dome lamp located over each door. The dome lamps shall include both red and clear bulbs. The dome lamps shall be round in shape and shall measure approximately 6.00 inches in diameter with chrome colored bezel. The light shall be activated by a three position toggle switch which shall be recessed in the ceiling on the side of the light as well as the clear portion of each lamp shall be activated by opening the respective door and shall override the active light regardless of which position the switch is in and shall return to the current switch position when the door is closed.

An additional two-section, red and clear Whelen LED dome lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include two (2) flashing Whelen OS Series LED light heads, one (1) red LED and one (1) amber LED, clearly labeled "Do Not Move Apparatus". In addition to the flashing lights, an audible alarm shall be included which shall sound while either light is activated.

Each flashing light shall be approximately 1.50 inches long X 1.00 inches wide X 0.50 inches high and shall be located centered left to right for greatest visibility.

The red light shall be interlocked for activation when a cab door is not firmly closed and the parking brake is released. The amber light shall be wired to the apparatus body by the OEM.

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista-style display and control screen which shall be labeled “E Master” for identification. The button shall feature control over

all devices wired through it. Any warning device switches left in the “ON” position when the master switch is activated shall automatically power up.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a virtual button on the Vista-style display and control screen.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the “Double Flash 150” left/right flash pattern.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the “Double Flash 150” left/right flash pattern.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red with a clear lens.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the Vista-style display and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be set to flash “Double Flash 150” left/right flash pattern.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be recess mounted into the side face of the bumper.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. The light shall be programmed to emit the "Double Flash 150” left/right flash pattern.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red with clear lens.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

AUXILIARY SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen series M6 Super LED 4.00 inch X 6.00 inch warning lights, one (1) each side, which shall feature multiple flash patterns including steady burn. The warning lights shall be set to flash “Double Flash 150” left/right flash pattern.

AUXILIARY SIDE WARNING LIGHTS COLOR

The auxiliary warning lights located on the side of the cab shall be red with clear lens.

AUXILIARY SIDE WARNING LIGHTS LOCATION

The auxiliary warning lights on the side of the cab shall be mounted rearward of the cab “B” pillar in the highest position available.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the Vista-style display and control screen. This button shall be clearly labeled for identification.

SIREN CONTROL HEAD

A Whelen 295HFSC9 electronic siren control head shall be provided. The siren head shall feature a 200-watt output, wail, yelp, manual siren, and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected. The siren shall be mounted to protrude through the center panel of the cab dash in the lower section centered from left to right in the panel.

HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista-style display and control screen shall be provided to allow control of the electric horn or the air horn from the steering wheel horn button. The horn button selection shall default to the air horn each time the Vista-style screen power is cycled off and on. The electric horn shall sound when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and a right hand side Line master model SP491-S81 foot switch for the officer near the officer door. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by two (2) Line master model SP491-S81 foot switches mounted in the front section of the cab for use by the driver and officer. The officer foot switch shall be located toward the officers door outboard of the air horn foot switch. A red momentary siren brake rocker switch shall be provided in the switch panel on the driver side of the dash. A red momentary siren brake rocker switch shall also be provided in the switch panel on the officer side of the dash.

The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring. The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

RED LAMPS

Stop Engine-indicates critical engine fault
Air Filter Restricted-indicates excessive engine air intake restriction
Park Brake-indicates parking brake is set
Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened
Low Coolant-indicates engine coolant is required

AMBER LAMPS
MIL-indicates an engine emission control system fault
Check Engine-indicates engine fault
Check Trans-indicates transmission fault
High Transmission Temperature-indicates excessive transmission oil temperature
ABS-indicates anti-lock brake system fault
HEST-indicates a high exhaust system temperature
Water in Fuel-indicates presence of water in fuel filter
DPF-indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration has been postponed due to user interaction
Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.
SRS-indicates a problem in the RollTek supplemental restraint system
Check Message-Turn Signal On
Check Message-Door Ajar
Check Message-Cab Ajar
Check Message-ESC Active
Check Message-DPF Regen Active
Check Message-No Engine Data
Check Message-No Transmission Data
Check Message-No ABS Data
Check Message-No Data All Communication with Vehicle Systems Has Been Lost
Check Message-Check Engine Oil Level
Check Message-Check Washer Fluid Level
Check Message-Check Power Steering Fluid Level
Check Message-Low Transmission Fluid Level
Check Message-Check Coolant Level

GREEN LAMPS
Left and Right turn signal indicators
ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle-indicates engine high idle is active.
Cruise Control-indicates cruise control is active
OK to Pump-indicates the pump engage conditions have been met
Pump Engaged-indicates the pump is currently in use
Auxiliary Brake-indicates secondary braking device is active

BLUE LAMPS
High Beam Indicator

WHITE LAMP
Wait to Start-indicates active engine air preheat cycle

AUDIBLE ALARMS FROM GAUGE PACKAGE
High Trans Temp
High or Low Voltage
Check Engine
Check Transmission
Stop Engine
Low Air Pressure
Fuel Low
Water in Fuel
ESC
High Coolant Temperature
Low Engine Oil Pressure
Low Coolant Level
Low DEF Level
Air Filter Restricted
Extended Left and Right Turn Remaining On
Cab Ajar
Door Ajar
ABS System Fault
Seatbelt Indicator

EXTERNAL AUDIBLE ALARM
Air Filter
Cab Ajar
Door Ajar
Check Engine
Stop Engine
Low Air Pressure
Water in Fuel
Low DEF
ABS System Fault
Seatbelt Indicator

The gauges shall be white face with black text.

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using blue LED backlighting.

CAMERA

An Audiovox Voyager heavy duty rearview camera system, complete with an LCD display monitor, shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle.

The camera shall be wired to multiplex system's display screen on the driver's side dash. If the unit is not multiplexed, a 7.00 inch flip down monitor which shall include a color display and day and night brightness modes will be installed above the driver position. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

The camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

The cab and chassis shall include diagnostic software for the Passenger Safety System shipped loose with the vehicle. The software kit shall include an interface module with connectors to link a laptop computer to the vehicle for diagnostic purposes.

WARRANTY

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the end user. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

CHASSIS OPERATION MANUAL

There shall be two (2) complete sets of chassis operation manuals provided with the chassis. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy. Each manual shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(1) Digital copy of the Engine Owner's manual

(1) Digital copy of the Transmission Operator's manual
(1) Hard copy of the Engine Operation and Maintenance manual with CD

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams. One (1) set shall be a printed hard copy, one (1) set shall be a digital copy.

AS BUILT AIR PLUMBING DIAGRAM

The cab and chassis shall include two (2) complete sets of the as built air plumbing system and option air plumbing diagrams. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy.

AS BUILT FUEL PLUMBING DIAGRAM

The cab and chassis shall include two (2) copies of the as built fuel system plumbing diagram. One (1) shall be a printed hard copy, one (1) shall be a digital copy.

CUSTOMER INSPECTION

There shall be a customer inspection of the chassis at the manufacturer's plant. The dealer, or the OEM shall be responsible for all travel costs and arrangements.

Travel over 200 miles shall be by commercial airline unless the vendor and the HFD agree upon alternative transportation.

The date of the chassis inspection shall be determined based on the requested chassis completion date, OEM production schedules, the chassis off-line date, and the chassis completion date.

All aspects of the inspection must be coordinated between the OEM/Dealer representative and the HFD.

CAB TILT CONTROL

There shall be a cab tilt pendant control provided and installed in the right front compartment of the apparatus. The cab tilt pendant shall be mounted horizontally adjacent to the roll out tray

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

FUEL FILL ASSEMBLY

There shall be a round polished fuel fill assembly located on each side of the apparatus body accessing the chassis supplied fuel tank. The assembly shall be located in the rear outrigger panel on each side

The fuel fill assembly will be not have a door. There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be removable, manufactured of plastic materials, green in color and equipped with a chain inside the neck.

The fuel fill cap shall be labeled "DIESEL FUEL". The stainless steel fuel fill neck shall have a 3/8" inside diameter vent line installed from the top of the fuel tank to the fill tube.

The fuel overfill and tank vent will be “T” connected at the end of the tube and be above 40”

HIGH WATER PERFORMANCE REQUIREMENT

The Apparatus specified shall be capable of operating in 40” of water with no permanent damage. It is understood that the air filter is below 40” but the intake shall be above the 40” requirement.

TOOL STORAGE PANEL

A tool storage panel shall be installed in the crew cab area of the apparatus. Size and location shall be determined at the pre construction conference between the vendor and the HFD. The panel shall be sprayed with red bed-liner to match the interior cab finish.

INTERIOR STORAGE COMPARTMENT/RADIO COMPARTMENT

Shall be installed inside of cab. The compartment will have two (2) sections with a lower open section (covered with snapped on cargo net) and an upper section.

The lower compartment shall have an adjustable DA finished shelf with Uni-Strut channel on the interior side walls.

The compartment shall have a full length OnScene light installed with a switch located inside the upper left hand corner. There will be an aluminum wire chase channel provided on the exterior back wall of the cabinet – the channel shall be a hat channel 2” wide and sprayed with red speedliner.

The compartment shall be installed behind the officer's seat, pushed forward as much as possible without interfering with the officer's seat operations. Final dimensions and location to be determined at Pre-construction conference.

RADIO & ANTENNA MOUNTING BASE

There shall be two (2) Larsen GPSDM700/2500FFS roof mounted antennas with sufficient length of 50 OHM coax cable and weather proof cab shall be supplied for two-way radios installed on the apparatus. The mounts shall be located on the cab roof in a best fit location determined by manufacturer but shall be at a minimum 36" apart. The cable shall be routed to the radio compartment with enough cable for the customer to route to the instrument panel if needed.

There will also be four (4) customer supplied speakers installed in the cab per HFD specifications. Two (2) of the speakers will have transformers. One in each rear corner of the cab and one behind the driver and officer up high, all speakers shall be aimed forward with a slight downward angle.

There will also be one (1) customer supplied radio installed flush in the upper left on the right side dash panel.

There shall be one (1) Gamber Johnson GJ DS-56 MDC horizontal surface base, with a Gamber Johnson GJ 7160-0419 Tilt/swivel motion attachment installed on the apparatus.

There shall be one (1) CF-AA5713AM-TM AC Power Adapter for the Panasonic MDT laptop installed in the cab as directed by Houston Fire Department Locations determined at pre-construction.

BATTERY CHARGER DISPLAY

A battery charger bar graph display shall be furnished and installed to the driver's seat box LED display shall be model # 091-1899-12-3.5D and shall be wired so to display the battery charge at all times even without the Kussmaul plugged in. Shall be installed as on previous units.

AIR TANK DRAIN CABLES (extended)

There shall be manual pull air tank drain rings provided with the apparatus. The airlines shall be extended to the outer edge of the apparatus to facilitate draining moisture from the chassis air tanks. A label shall be affixed indicating “Air Tank Drain”.

HOSE AND HARNESS ROUTING

Any wiring harness or hydraulic /air hoses that must pass to the outside of the frame will not run over or under the frame flanges between body and chassis. Hydraulic and airlines will pass through the frame using bulkhead fittings. All battery cables will also utilize bulkhead fittings. Wiring harnesses will pass through the frame within a protective rubber boot. For ease of maintenance, the hydraulic air hoses and electrical wiring harness will be ran separately down each side of the frame rails. The hydraulic and air hoses run down the right side of the frame rails, and the electrical harnesses run down the left side of the frame rails.

CHASSIS REQUIRED LABELING

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided and installed in the cab and be visible from all seating positions.

There shall be a lubrication plate mounted inside cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid (if applicable)

• Drive Axle Lubrication Fluid
• Generator Lubrication Fluid (if applicable)
• Tire Pressures

CAB WARRANTY PLATE

A cab warranty plate will be provided. The exact warranties to be listed and how/where they are listed will be determined at pre-con. Warranty information is also listed in the vista style display.

APPARATUS INFORMATION LABEL

A high-visibility label shall be provided and installed in a location clearly detectable to the driver while in the seated position indicating the following:

• Overall Height listed in feet and inches.
• Overall Length listed in feet and inches.
• Overall GVWR listed in tons.

CAB HELMET WARNING LABEL

A high-visibility label shall be installed in a location clearly detectable from each seating position. The label shall indicate the following specified information.

“DO NOT WEAR HELMET WHILE SEATED”

HELMET RESTRAINTS

All NFPA required helmet restraints will be supplied and installed by the Customer prior to the truck being placed into service.

MUD FLAPS

Heavy-duty rubber mud flaps shall be provided behind the rear wheels. The mud flaps shall be black rubber type and be bolted in place.

EXHAUST HEAT SHIELD

There shall be an exhaust heat shield added to the chassis provided exhaust. The shield shall be under the R2 and R3 compartments and shall incorporate a heavy duty spray on insulation under the R2 and R3 compartments. With this shield the temperature of the R2 and R3 compartments shall not exceed the ambient temperature.

AERIAL WATERWAY

The aerial waterway shall have an inlet provided and installed at the rear of the apparatus. A Class 1 3.5" (88mm) gauge shall be supplied for the pressure reading 0-400 psi. The gauge shall be a model Class 1 LFP-310 and be installed at the rear of the truck for reading inlet pressure from the rear of the truck.

Space Frame Body - ALUMINUM

The apparatus body shall be a Space Frame design, which serves as the structural skeleton of the body. This framework acts as a series of beams and columns that support and protect the body and its contents. The space frame design provides maximum torsional resistance and load capabilities. The entire space frame structure shall be welded together utilizing an A.W.S.Certified welding procedure. NO EXCEPTIONS.

The space frame design shall also be required because it provides energy absorbing impact zones in the structure, thus providing increased safety to the rest of the apparatus and personnel on board. Documented proof of this extra safety shall be required upon request.

The body structure shall consist entirely of closed section members, except where the body is mounted to the chassis. Closed section members (such as square, rectangular, triangular, or round tubes) are required because they provide maximum strength and torsion rigidity. This style of design ultimately reduces fatigue and shall add longevity to the body structure.

Body Structure Members: The space frame body shall have triangular shaped structural members in certain areas of the body. This shape is required to prevent loss of useable compartment space. Other body structure members shall be square or rectangular. Each structural member will have a nominal outside dimension of 2.5” in at least one direction. The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members varies from .188 to .250 throughout, dependent on the design requirement.

Body Material Type: All body structural members shall be Aluminum 6061-T6 alloy material. All .188 sheet material shall be Aluminum Alloy 5052-H32 and .250 sheet material shall be Aluminum Alloy 3003. These alloys are required because it provides optimum all-around performance for strength, manufacturing properties, and corrosion resistance.

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor.

Front Body Compartment Walls: The front compartment walls of both forward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments.

Rear Body Compartment Walls: The rear compartment walls of both rearward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments. Access panels from the rear walls shall be strategically placed to ensure access to the rear taillight clusters for any servicing that may be completed.

Compartment Top: The top of the compartments shall be an integral portion of the body. No overlay material shall be visible from the interior of the compartments.

Compartment Floors: The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a 1” lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and

form a “sweep-out” compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

Compartment Load Capacity: Each compartment shall have a minimum of one additional structural compartment floor support centered on the underside of the compartment floor. This additional member shall be integral with the rest of the body structure. Each compartment must be designed, and 3rd party analyzed to carry a working load of:

Full depth side compartment: 1,000 lbs. per compartment
Half depth side compartment: 750 lbs. per compartment
NO EXCEPTIONS

Finite Element Analysis: The proposed body design must have completed a review and analysis by a legitimate 3rd party engineering firm. At a minimum, the 3rd party must have conducted a computer model finite element analysis of the proposed design. The analysis is to include real world working load scenarios. Analysis to cover both static and dynamic situations must be completed. The purpose of the finite element analysis is to ensure proper design of the apparatus body, and that it is capable of carrying the typical fire apparatus loads and those specified by NFPA for equipment. The analysis process must conclude that the body structure is properly designed and manufactured to provide longevity under normal conditions. The 3rd party must also validate the manufacturing processes are consistent with the design and analysis performed. Proof of having completed this testing must be submitted with the proposal. NO EXCEPTIONS.

PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturer's recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the proposal.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Material Data Safety Sheet".

The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications.

Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials). BMS 10-72A (Boeing Material Specifications).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body, will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects. The coating will meet the following test performance properties as a minimum standard.

BODY PAINT COLOR

PPG 926326 Red.

COMPARTMENT FINISH

The compartment interiors shall be coated with bed-liner. The color shall be medium gray.

OVERLAYS

The entire front face of the apparatus body shall have aluminum diamond plate overlays installed.

The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

The front of the apparatus body, vertical wall overlay shall be integrated with a 1/8” aluminum diamond plate corner trim pieces for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The rear face of the apparatus body, vertical wall overlays shall be installed with a 1/8” aluminum diamond plate 1.0” x 1.0” corner trim piece, for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The vertical edge trim piece that is protecting the chevron striping surface or that is utilized for the purpose of striping, shall be secured utilizing fasteners only.

CATWALKS

The catwalks shall be constructed with materials of a non-slip embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

REAR TAILBOARD

On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901).

The rear step will be made of .25" painted steel and shall extend 6" deep x 4" tall and 97" wide with chamfered ends.

The center (3) DOT lights shall be recessed in the tailboard

GENERAL BODY DETAILS

All compartmentation shall be constructed in a sweep out design to be water and dust resistant, and manufactured to the maximum possible storage capacity.

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. The Manufacturer may be requested to supply evidence of fastener coating and results of salt spray testing when dissimilar metals are used. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

WHEEL WELLS

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

WHEEL WELL MODULES

The body wheel well area shall be fabricated of smooth aluminum and finish painted. There shall be “smart storage” compartmentation features incorporated on each side of the apparatus body wheel well modules to utilize and maximize storage space availability. The smart storage compartment doors shall be painted 3/16" Aluminum.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold three (3) 1-hour carbon cylinders with 1" nylon safety loops installed. The compartment shall be located in front of the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold three (3) 1-hour carbon cylinders with 1" nylon safety loops installed. The compartment shall be located between the axles on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold three (3) 1-hour carbon cylinders with 1" nylon safety loops installed. The compartment shall be located behind the axle on the left side.

EXTINGUISHER COMPARTMENT

There shall be a storage compartment for one (1) each 20 pound ABC and 2.5 gallon water extinguishers located in the wheel well. The compartment shall be located between the axles on the right side.

EXTINGUISHER COMPARTMENT

There shall be a storage compartment for two (2) 15# CO2 Extinguishers located in the wheel well. The compartment shall be located behind the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold one (1) 1-hour carbon cylinders with 1" safety loops installed and (2) O2 bottles. The compartment shall be located behind the axle on the right side.

SMART STORAGE DOOR OPEN INDICATORS

Each smart storage compartment door shall have a black magnetic style switch.

If the door is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew. The vista display shall also display the open door.

AERIAL BODY MOUNTING SYSTEM

The complete apparatus body shall be modular in construction and built separately from the chassis. The apparatus body shall be mounted to the chassis framework with angular framework hangers. The body shall be combination bolted and welded to the hangers to reduce fatigue of the body material in mounting locations. The hangers shall reach out underneath the body compartmentation to serve as a full-width under body support in several areas along the length of the body side.

During installation of the mounting system all welding to the chassis frame rails and all drilling will be performed within the parameters established by the chassis manufacturer. Under no circumstances shall any drilling be done in the upper or lower flanges between the axles.
BODY STRUCTURE WIDTH

The width of the apparatus body from the outside of the left compartments to the outside of the right compartments shall be a minimum of 96"and not more than 100" excluding any attached peripherals such as rub rails, fenderettes, grab handles, etc.

COMPARTMENT VENTILATION

To allow for proper air circulation & flow, each compartment shall have a venting route. The venting locations shall be determined by best-fit for each body configuration. Louvered plate vents shall be installed appropriately on the compartment interior walls.

SIDE COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed in all apparatus body "SIDE" compartments, to accommodate the installation of shelves, trays, tool boards and or other miscellaneous equipment.

COMPARTMENTATION

L1: There will be one (1) high side compartment forward of the front outriggers. This compartment will have a single roll-up door. The interior dimensions of the compartment will be approximately 51.5"W x 77"H x 22.5"D in the lower section and transverse in the upper section. The useable opening will be approximately 49.25"W x 67.25"H.

L2: There will be one (1) compartment above the front outriggers. This compartment will have a lift up pan door. The interior dimensions of the compartment will be approximately 24.25"W x 29"H x 25.5"D. The useable opening will be approximately 20"W x 21.5"H.

L3: There will be one (1) compartment forward of the rear wheels. This compartment will have a single roll-up door. The interior compartment dimensions will be approximately 47.5"W x 77"H 25"D in the lower section and transverse in the upper section. The compartment will have a useable opening of approximately 40.25"W x 68"H.

The L3 compartment shall have a vertical divider that shall extend from the transverse compartment to the driver side door. There shall be a shelf to act as a floor extension in the L3

compartment. There shall be a removable panel in the R3 compartment to act as a stop for the FD supplied struts

L4: There will be two (2) high side compartments forward and above the rear wheels. This compartment will have two (2) single roll-up doors. The interior dimensions of the compartment will be approximately 59"W x 47.5"H x 25"D in the lower section and transverse in the upper section. The useable opening will be approximately 54"W x 38"H.

L5: There will be two (2) high side compartments rearward and above the rear wheels. This compartment will have two (2) single roll-up doors. The interior dimensions of the compartment will be approximately 56.75"W x 37.75"H x 25"D in the lower section and transverse in the upper section. The useable opening will be approximately 54"W x 30X"H. The upper portion shall be transverse.

The L5 compartment will include a custom made insert to hold the stokes basket and tripod lights. A permanent shelf will support the insert to the edge of the compartment opening.

L6: There will be one (1) compartment forward of the rear outrigger. This compartment will have a single roll-up door. The interior dimensions will be approximately 32"W x 67.25"H x 20"D. The compartment will have a useable opening of approximately 24.75"W x 59"H.

L7: There will be one (1) compartment above the rear outrigger. This compartment will have a lift up box pan door. The interior dimensions of the compartment will be approximately 25.25"W x 20"H x 20"D. The useable opening will be approximately 21.5"W x 14.5"H.

R1: There will be one (1) high side compartment forward of the front outriggers. This compartment will have a single roll-up door. The interior dimensions of the compartment will be approximately 51.5"W x 77"H x 22.5"D. The useable opening will be approximately 49.25"W x 67.25"H.

R2: There will be one (1) compartment above the front outriggers. This compartment will have a lift up pan door. The interior dimensions of the compartment will be approximately 24.25"W x 29"H x 25.5"D in the lower section and transverse in the upper section. The useable opening will be approximately 20"W x 21.5"H. The compartment floor will extend to the door opening to facilitate the mounting of the transverse tray.

R3: There will be one (1) compartment forward of the rear wheels. This compartment will have a single roll-up door. The interior compartment dimensions will be approximately 47.5"W x 77"H x 25"D in the lower section and transverse in the upper section. The compartment will have a useable opening of approximately 40.25"W x 68"H.

R4: There will be two (2) high side compartments forward and above the rear wheels. This compartment will have two (2) single roll-up doors. The interior dimensions of the compartment will be approximately 59"W x 47.5"H x 25"D in the lower section and transverse in the upper section. The useable opening will be approximately 54"W x 38"H.

R5: There will be two (2) high side compartments rearward and above the rear wheels. This compartment will have two (2) single roll-up doors. The interior dimensions of the compartment

will be approximately 56.75"W x 37.75"H x 25"D in the lower section and transverse in the upper section. The useable opening will be approximately 54"W x 30"H.

The R5 compartment will include a custom made insert to hold the stokes basket and tripod lights. A permanent shelf will support the insert to the edge of the compartment opening.

R6: There will be one (1) compartment forward of the rear outrigger. This compartment will have a single roll-up door. The interior dimensions will be approximately 32"W x 67.25"H x 20"D. The compartment will have a useable opening of approximately 24.75"W x 59"H.

R7: There will be one (1) compartment above the rear outrigger. This compartment will have a lift up box pan door. The interior dimensions of the compartment will be approximately 25.25"W x 20"H x 20"D. The useable opening will be approximately 21.5"W x 14.5"H.

AERIAL COMPARTMENT

There shall be one (1) compartment "A" located directly behind the aerial ladder boom support on each side of the apparatus.

The approximate interior dimensions of these compartments shall be a minimum of 38" wide by 66.5" high. The lower 21" of the compartment shall be 22.5" deep and the upper area shall be transverse. The door openings shall measure approximately 34" wide by 57.5" high. The compartment will have approximately 115 cubic feet of space.

This compartment shall have a roll-up door on both sides.

ROLL-UP DOOR CONSTRUCTION

All horizontal and vertical side compartment doors shall be roll-up style doors.

R.O.M ROLL-UP DOORS

R.O.M Corporation brand roll-up doors shall be provided and installed on the apparatus. The door slats shall be of a double wall box frame extrusion. Exterior surface shall be flat and the interior surface shall be concave to prevent loose equipment from jamming the door. The slats will be anodized to prevent oxidation and there shall be inner-locking end shoes on every slat, secured by a punch and dimple process. The slats shall have interlocking joints with a folding locking flange. There shall be a PVC/Vinyl inner seal between each slat to prevent metal to metal contact.

The track shall be of a one piece aluminum design with an attaching flange and finishing flange incorporated into its design to facilitate installation and provide a pleasing finished look without additional trim or caulking. The track shall have a replaceable side seal to resist water and dust intrusion into the compartment.

The drip rail shall be fabricated of aluminum and have a built in replaceable wiper seal. The Roll-up door shall have a 4"diameter counterbalance, to assist in lifting while eliminating the risk of accidental closing. The door shall be secured by a full width lift bar, operational by one hand with heavy gloves. The securing method will be of a positive latch device design.

SIDE COMPARTMENT DOORS WET PAINTED

The side compartment roll up doors shall be wet finish painted to color match the apparatus body. The door track and trim shall be satin aluminum finish.

ROLL-UP DOOR PROTECTORS

There shall be a protective cover installed under each body compartment door roll to protect the door in the rolled up position.

Each cover shall be fabricated of smooth aluminum and of natural finish.

DOOR ASSIST STRAPS

There shall be nylon straps installed on both the left and right body side 'high side' compartment doors to assist in closing the door. The strap shall be attached to each door and permanently mounted to the rearward wall with footman loops using nutzerts, half way between the top and bottom of the compartment.

DOOR OPEN INDICATOR

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the bar is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the "Door Open" indicator light in the cab to warn the crew.

SILL PLATES

Mirrored stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

OVER-WHEEL COMPARTMENT PARTITIONS

Compartment partitions, fabricated of the same material as the body, shall be welded in place in all over-wheel compartments flush to the forward and rearward frame openings.

These partitions shall aid in keeping loose equipment from falling into the fore and aft compartments.

REAR CENTER LADDER STORAGE AREA

There shall be a rear center storage area constructed for ladder storage. The ladder storage area shall utilize the area enclosed by the torque box of the aerial device. The ladder storage area shall be constructed as large as possible within the confines of the torque box area.

The ladder storage area shall be used to store ground ladders on edge. The area shall be divided to allow removal of any such ladder without disturbing the storage of any other. The

ladders shall be stored on slides to separate the ladders from each other. The lower slides shall be fabricated of extruded polyester structural angles for low friction and prevention of damage to ground ladder rails. The upper slides shall be fabricated of formed aluminum laminated with polypropylene wear pads to hold the ladders in alignment and prevent metal to metal contact between the ladders and slides. The ladder slides shall be bolted in place for easy removal.

Ladder stops shall be provided at the front of the ladder slides to prevent the ladders from sliding forward. A hinged ladder stop shall be provided at the rear to prevent the ladders from sliding rearward and fouling the roll-up door.

The ladder storage area shall also be utilized for storage of any other miscellaneous equipment, such as pike poles and miscellaneous equipment as available space allows.

A roll-up door shall be provided over the rear ladder storage area to provide access to the storage area and prevent dirt and road grime from drafting into the area.

LADDER BOX STORAGE:

• (1) Alco Lite 35' 2 Section Ladder
• (1) Alco Lite 50’ 3-Section Ladder
• (2) Alco Lite 28' 2 Section Ladder
• (2) Alco Lite 16' Roof Ladder
• Alco Lite 10' Aluminum Folding Ladder
• Alco Lite 12' Folding Ladder

PIKE POLE STORAGE:

• Fire Hooks Unlimited RH-8 New York Roof Hook
• Fire Hooks Unlimited RH-6 New York Roof Hook
• Fire Hooks Unlimited RH-12 New York Roof Hook
• Akron (UT-3)
• Akron (UT-6)
• Akron (UT-8)
• Akron (UL-12)

There shall be a stop in the front of each slot to prevent the items from sliding forward.

The pike poles shall be in individual tubes in an individual compartment inside the torque box behind an aluminum door. There shall be a cavity above the pike pole storage that shall hold a FD made pike pole and the door for the pike poles shall also cover this cavity. The ladder slides shall be full length of the ladder and shall have a stop for each individual ladder.

FENDERETTES

Four (4) polished stainless steel federates shall be provided on body rear wheel well openings, two (2) each side. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to resist deterioration.

OUTRIGGER ACCESSORIES

The outriggers shall be controlled from the rear of the apparatus. A control box with a hinged door shall be furnished on each side, installed per NFPA, lighted for night operations. There will be a side to side indicator furnished and installed at the rear of the apparatus to aid in leveling the unit.

There will be four (4) outrigger pad mounting/storage slots furnished below the body, two (2) each side, adjacent to each stabilizer.

OUTRIGGER COVERS

Brushed stainless steel covers shall be installed over the front and rear outrigger areas, one on each side of the apparatus, front and rear. Each cover shall mount directly to the outrigger stabilizer arm and extend with the outrigger.

TURNTABLE ACCESS

There will be ground-to-turntable access ladders provided, one (1) each side at the left and right rear corners of the body. Each ladder will be constructed from aluminum plate and heavy-duty cast aluminum steps. To assure a safe climbing angle, the uppermost portion of each ladder will be immediately adjacent to the upper fire body, while the lowest step on the ladder will be approximately 14” from the edge of the body and shall be fold out design. There shall be (2) full height grab rails at each access step area.

The steps will each measure a minimum of 16” wide x 6” deep and placed on approximate 13” centers. Steps will be open grip type with a raised, slip-resistant surface, exceeding the requirements of NFPA 1901, 15.7.4. The steps will be attached to side rails constructed of minimum 1/2” thick x 3” wide aluminum plate, creating a sturdy, long lasting structure.

There shall be (3) On Scene 9" LED lights in polished housing for each turntable access step.

OVER-WHEEL COMPARTMENT PARTITIONS

Compartment partitions, fabricated of the same material as the body, shall be welded in place in all over-wheel compartments flush to the forward and rearward frame openings.

These partitions shall aid in keeping loose equipment from falling into the fore and aft compartments.

SHELVING

Each shelf shall be fabricated of 3/16" thick aluminum sheet material with the outside and inside edges flanged up to prevent equipment from sliding off. Each shelf shall be as wide as possible to allow proper attachment to uni-strut channels. Each shelf shall be adjustable up and down.

The following shall be provided:

A {25.5”} deep shelf shall be supplied and installed in the compartment. Each shelf shall be as wide as possible and there shall be a total quantity of seven (7). All sides of the shelves shall have a DA finish with red diamond grade striping on the front of each shelf.

• One (1) located in the L-3 compartment.
• One (1) located in the L-4 compartment.
• One (1) located in the L-5 compartment.
• One (1) located in the L-6 compartment.
• One (1) located in the R-3 compartment.
• One (1) located in the R-4 compartment.
• One (1) located in the R-5 compartment.

ROLL-OUT TRAY

Each tray shall be fabricated of 3/16" thick 3003 grade or higher aluminum with four 3” side flanges; corner welded for maximum strength. Each tray shall be as wide and deep as the door allows and secured to (Austin Hardware) “heavy duty” slide assemblies.

The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a lock-in, lock-out (FDR) front drawer release system. The following shall be provided:

A {300#} capacity tray with {100%} extension shall be installed to the compartment floor. There shall be a total quantity of five (5). All sides of the tray shall have a DA finish with red diamond grade striping on the front and sides of each tray.

• One (1) located in the L-1 compartment.
• One (1) located in the L-3 compartment.
• One (1) located in the L-6 compartment.
• One (1) located in the R-1 compartment.
• One (1) located in the R-3 compartment.

A {300#} capacity tray with {100%} extension and adjustable height utilizing uni-strut materials shall be installed. There shall be a total quantity of two (2). All sides of the tray shall have a DA finish with red diamond grade striping on the front and sides of each tray

• One (1) located in the L-3 compartment.
• One (1) located in the R-3 compartment.

ROLLOUT TRAY

Each tray shall be fabricated of 3/16" thick 3003 grade or higher aluminum with four 3” side flanges; corner welded for maximum strength. Each tray shall be as wide and deep as the door allows and secured to an (On Scene) rollout slide system constructed of anodized aluminum extrusions and assembled using stainless steel fasteners (no welds).

The slide shall use a three extrusion rail design utilizing twelve to sixteen (12-16) urethane rollers. The roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. The slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed and full extension positions. The following shall be provided:

A {1000#} capacity tray with {100%} extension and adjustable height utilizing uni-strut materials shall be supplied and installed. There shall be a total quantity of two (2). Shall be approx. 45" deep and shall be mounted in the transverse area of the L4/R4 compartment. All sides of the tray shall have a DA finish with red diamond grade striping on the front and sides of each tray

• One (1) located in the L-4 compartment.
• One (1) located in the R-4 compartment.

A {1000#} capacity tray with {100%} transverse directional extension shall be supplied and installed. There shall be a total quantity of one (1). There shall be a 3/16" aluminum tool board mounted on this tray and shall be mounted on uni strut for adjustability front to rear, the tool board shall be gusseted on each end to additional support.

All sides of the tray shall have a DA finish with red diamond grade striping on the front and sides of each tray

• One (1) located in the L-1 compartment.

PULL-OUT TOOL BOARD/ALUMINUM

An aluminum pull-out tool board shall be installed in the compartment as specified. The too board shall be attached to uni-strut material mounted on the floor and ceiling of the compartment, extending perpendicular to the rear wall, allowing for horizontal adjustment from front to rear.

The tool board shall be mounted on ball bearing slides, top and bottom. A locking device shall be installed on the lower slide to keep the board in the stored and extended positions. There shall be a total quantity of three (3). The pull-out/swing-out style tool board, shall have RED reflective striping installed making the perimeter of the tool board more readily visible.

• Three (3) located in the R-6 compartment.

TRANSVERSE COMPARTMENTS

There shall be a free standing, permanently mounted, rescue equipment storage compartment provided and installed with the apparatus. The compartment shall be constructed of 1/8" smooth aluminum and allow access from either side if mounted in a transverse designed section. The interior floor of the compartment shall be lined with black ABS plastic for ease of stowing and un-stowing equipment.

The compartment shall include provisions for mounting the following:

There shall be (2) cavities in the transverse cavity of the L3/R3 compartment with a vertical dividers made of 3/16" DA'd aluminum. The forward cavity shall be for Misc. items. The rear cavity shall be for FD supplied struts and shall have a dividers between them accessed from the driver's side only. The floor shall be extended to the door using a shelf. There shall be a vertically hinged door with a push button latch with NO tabs. The cavity forward shall have drop down door with a double return flange with push button latches with NO tabs. Transverse cavity shall be partitioned off to the R3 compartment with a removable panel in the R3. The compartment shall be located in the L-3/R-3 transverse compartment area.

There will be a custom made aluminum insert installed in the R1 compartment. The insert will hold one (1) little giant ladder. The compartment shall be located in the R-1 compartment area. The compartment shall incorporate heavy duty seat belt style latch.

There shall be (2) cavities in the transverse cavity of the L5/R5 compartment with a vertical dividers made of 3/16" DA'd aluminum. The forward cavity shall be for FD supplied stokes. The rear cavity shall be for FD supplied tripods and shall have a horizontal divider between them. The floor shall be extended to the door using a shelf. There shall be a vertically hinged door with a push button latch with NO tabs. The cavity forward shall have drop down door with a double return flange with push button latches. The stokes shall be accessed from either side, the tri pods shall be accessed from the officer's side of the body only. The transverse cavity shall be partitioned off in the L5 compartment and shall be speedlined. The compartment shall be located in the L-5/R-5 transverse compartment area.

SIDE RUB RAILS (ALUMINUM CHANNEL)

The lowest edge of the apparatus body side compartments shall be trimmed with brightly anodized aluminum channel rub rail material.

The rub rails shall be approximately 3.00" high with flanges turned outwards for increased rigidity, with each end chamfered to a 45 degree angle. The rub rails shall not be constructed as an integral part of the apparatus body structure, allowing each rub rail to be easily removed in the event of damage.

The rub rails shall be secured with stainless steel fasteners and spaced away from the apparatus body with ½" nylon spacers, to help absorb moderate side impacts and prevent the collection of water and debris for easier cleaning.

RUB RAIL REFLECTIVE STRIPING

One inch reflective striping (3M Diamond Grade) shall be applied to the length of each rub rail section making the perimeter of the apparatus more readily visible.

The reflective striping shall be red in color.

The roof of the body shall be overlaid with materials of an embossed aluminum diamond plate required to meet minimum NFPA standard requirements for slip resistance.

CHROMED TOW EYES

There shall be two tow eyes installed on each rear frame rail. The tow eyes shall be connected directly to the frame rails and extend outside the rear vertical wall. The tow eyes are to have an inside diameter of approximately 2" and shall be chrome plated

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Logic Controlled, Low-Voltage (12v) Electrical System, compliant with the latest revision of the NFPA 1901 standard guidelines. The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (similar to operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or system modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as extra harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and an apparatus-specific reference of I/O shall be furnished in the final delivery manuals. These drawings shall illustrate the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus manufacturer shall not be accepted.

LED DOT LIGHTING

There shall be a total of eleven (11) red clearance lights and two (2) amber clearance lights on the apparatus. There shall be seven (7) red clearance lights located on the rear of the apparatus, five (5) lights shall be in the rear rub rail and two (2) lights shall be as high and wide as possible. On the sides of the apparatus there shall be four (4) red clearance lights, two (2) located on each side of the apparatus in the rub rails at the front and rear portion of the rear compartments. Additionally on the sides of the apparatus there shall be two (2) amber clearance lights, one (1) located on each side of the apparatus in the rub rail at the rear portion of front compartments.

There shall be four (4) amber intermediate turn signals located on the sides of the apparatus. They shall be located two (2) on each side of the apparatus in the rub rail, one (1) at the front of front compartments and one (1) at the front of the pump compartment. The intermediate turn signals shall be steady burn until the turn signals are activated and at that time shall flash until deactivated

The lights shall be Whelen OS series LED red and amber markers. The three in the center of the rear bumper shall be recess mounted.

There shall also be two (2) Britax rubber mounted marker lights mounted on the body one (1) each side as far to the rear as possible.

LED REAR TAIL LIGHT WARNING CLUSTER

There shall be individual Whelen M6-Series Super LED, rear tail light cluster provided and installed in individual polished bezel on the rear of the apparatus, one each side. The cluster shall consist of the following specified components:

1 - Whelen #M6FC Bezels
1 - Whelen #M6BTT LED red brake light
1 - Whelen #M6T LED series amber turn signal light
1 - Whelen #M6 BUW LED clear backup light
1 - 4X6 spot for the warning lamp specified below

All (4) four lights shall be installed in a single bezel designed to be mounted as a single unit.

BACKUP LIGHTS

The backup lights shall illuminate when the apparatus is placed in reverse.

ON SCENE COMPARTMENT STRIP LIGHTING

One (1) "Night Axe" LED strip light shall be installed in four (4) high side upper compartment(s).
Two (2) "Night Axe" LED strip lights shall be installed in four (4) over wheel compartment(s).
Two (2) "Night Axe" LED strip lights shall be installed in six (6) full height compartment(s).
Two (2) "Night Axe" LED strip lights shall be installed in the rear center compartment.

PERIMETER LIGHTS

There shall be fourteen (14) LED underbody perimeter lights provided and installed, One (1) under each side of the front bumper, one (1) under each cab door, one (1) each side of the body first compartment, one (1) each side of the body last compartment, one under each turn table access step, and one (1) under each side of the rear step to illuminate the ground around the truck.

UPPER LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

ZONE A: There shall be a pair of Whelen model FNMINI 24" Edge Ultra Freedom light bars provided and installed with the apparatus. The light bar shall each house two (2) front corner red linear LEDs, one (1) front white linear LED and one (1) side red linear LED. The outer lenses shall be clear.

A 3M Opticom system, model 792H shall be installed on the cab roof, directly in front of the light bar. There shall be an indicator on the drivers switch panel indicating the opticom is activated.

ZONE C: One (1) pair of Whelen, model M6RC 4"x6"flashing red LED lights with clear lenses and chrome bezels shall be provided and installed on the apparatus. One (1) each side in the upper rear corners of the apparatus body.

LOWER LED WARNING LIGHTING

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

ZONES B&D: There shall be four (4) Whelen model M6RC 4"x6" flashing red LED lights with clear lenses and chrome bezels, provided and installed with the apparatus. Two (2) on each side of the apparatus.

ZONE C: There shall be four (4) Whelen model M6RC 4"x6" flashing red LED lights with clear lenses and chrome bezels, provided and installed on the rear of the body. Two (2) in the upper zone and two (2) in the lower zone.

ADDITIONAL WARNING LIGHTS

In addition to the NFPA warning light package, there shall be six (6) Whelen ION red LED lights with clear lenses installed three (3) each side. In addition to the NFPA warning light package, there shall be six (6) Whelen ION Series red LED lights with clear lenses installed three (3) each side.

The lights shall be installed under each L1/R1, L3/R3 and L6/R6 compartments on the lower body sides. The lights shall be recess cut into the rub rail mounted to the body tube.

REAR DIRECTIONAL LIGHT BAR

There shall be eight (8) rear directional lights provided and installed on the rear of the apparatus body.

The lights shall be Whelen model #WIONSMCA LED ION amber lights with clear lenses and chrome bezels. Each light shall be surface mounted and equally spaced, spanning horizontally across the rear of the apparatus.

The lights shall be controlled by a Whelen #TACTLD1 control head.

There shall be no cover over the rear directional light bar.

REAR VIEW CAMERA SYSTEM

A chassis supplied camera shall be surface mounted on the center rear of the apparatus body for maximum viewing capability. A protective shroud shall be installed over the system to protect against damage.

The cable to be encased in flexible conduit that will not have 90 degree fittings so it can easily be removed/replaced without unbundling wires and hoses

12 VOLT SCENE LIGHTS

There shall be a Whelen model #M6ZC 12 volt gradient scene light with chrome bezel provided and installed with the apparatus as specified:

• There shall be a total quantity of two (2).
• The scene lights shall be located on the rear of the body, one (1) each side.
• The scene light(s) shall be activated through the multiplexing vista-style display or when transmission is shifted into reverse.

12 VOLT PEDESTAL MOUNTED SCENE LIGHTS

There shall be a Whelen Pioneer model #PFP2/PBAPEDD, pedestal mounted dual lamp, 12volt, LED flood light provided and installed as specified below:

• There shall be a total quantity of four (4)
• The scene lights shall be located on the side of the body, two (2) on each side, and one (1) at the front (above the front of L1/R1) and one (1) at the above the front corner of L5/ R5) of the catwalks.
• The scene lights will be individually switched in the L1 compartment with momentary rocker switches adjacent to the load Center and through the Vista-style screen.

UL TESTING 110/220-VOLT & GENERATOR

The apparatus electrical and generator system shall be tested and UL certified.

HARRISON HYDRAULIC 10,000 WATT GENERATOR

The generator shall be one (1) Harrison MAS Hydraulic Driven Generator rated at 10,000 watts, 82/84 amps, 120/240 VAC, 60Hz, 1-phase.

The generator shall have top access to the oil filter, oil fill tube and electrical interface box.

The hydraulic oil reservoir shall include an oil level sight gauge visible from three sides; an oil temperature gauge; an oil fill cap; an oil filter and an internal venturi boost unit to provide positive pressure to the pump suction port.

The hydraulic oil reservoir shall be shipped attached to the structural steel frame. The hydraulic oil reservoir shall have an option to be remote mounted if required.

The generator shall have a cover consisting of NFPA approved diamond tread plate.

A meter package that provides the frequency, voltage and amperage of each leg shall be provided.

The generator shall not utilize electronic controls or a multiplex system to control the frequency.

The generator shall include a bypass solenoid to remotely turn the generator on/off with a 12 VDC signal.

The generator shall be a commercial type with a heavy-duty bearing and of brushless design to ensure low maintenance. No brushes or slip rings shall be allowed.

The system shall be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed.

The generator shall be able to be used while vehicle is either stationary or in motion. The generator shall provide an option for a self-sealing air intake to prevent recirculation of exhaust air.

The generator shall provide an option for a vertical exhaust fan in addition to the air intake fan. Single fan systems shall not be allowed.

The generator shall provide a dedicated air intake duct for the alternator and a dedicated air intake duct for the heat exchanger. Both air intake ducts shall be located on the same side of the generator.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. Gear motors shall not be allowed.

The hydraulic pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands. Use of electronics to control the flow shall not be allowed.

The system shall be capable of normal operations using a commonly available premium hydraulic oil; Mobile DTE series or equivalent. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system shall be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

The generator shall be tested at the full nameplate rated load prior to shipping and the test report shall be included. The test report will document the generator's performance at various loads from no load to full load to ensure reliable power delivery at those loads.

The generator shall have a fluid level indicator on the rearward side of the generator that shall be visible from the turn table control pedestal

HOT SHIFT PTO

A 'hot' shift shall be added to the hydraulic generator installation.

The PTO shall remain 'engaged' to keep fluid circulating through the system. A guarded switch shall be located on the cab dash or other operator accessible area in the cab. The switch shall be used to disconnect the PTO from the transmission in the event of hydraulic failure (broken hose, etc.) during operation.

The switch shall be labeled "GENERATOR EMERGENCY STOP".

A second switch with an indicator light shall be provided to excite the generator. The switch shall be labeled “GENERATOR EXCITE”.

The generator excite application shall be activated through the multiplexing vista display and a weather resistant momentary rocker switch located in the L1 compartment.

LOW HYDRAULIC FLUID DISPLAY

There shall be a low level visual and audible warning alarm located next to the FROG, indicating the hydraulic fluid is low.

GENERATOR INSTALLED

The generator shall be installed on top of the body, between the L1 and R1 compartments and behind the hydraulic tank for the aerial.

GENERATOR DISPLAY

A FROG (Frequency Regulation of Generator) generator display kit shall be installed to monitor a 50/60 Hz, generator.

The kit shall include:

• Display module.
• Voltage transformer.
• Current transformers and cables.
The display module shall consolidate five (5) generator monitoring instruments into one device. The display case shall be waterproof and have dimensions not to exceed 4 1/4" high by 4 1/4" wide by 3 1/4" deep.

The following continuous displays shall be provided with super bright LED digits more than 1/2" high:

• Generator frequency in hertz
• Line 1 current in ampere
• Line 2 current in amperes
• Generator voltage in volts
The program shall support the accumulation of elapsed generator hours and the monitoring of hydraulic oil temperature. Generator hours and oil temperature shall be displayed at the push of a button. Audible warning alarm outputs are provided for generator overload, over/under voltage fluctuations, and high oil temperature.

The display shall be installed flush mounted on a custom fabricated angled mounting bracket, installed in the L-1 compartment.

LOAD CENTER

An electrical load center shall be provided and installed in a protected environment on the apparatus. The load center shall have provisions for up to eight (8) 20 amp manual reset type circuit breakers.

There shall be an electrical load center provided and installed in a protected environment. The load center shall have provisions for eight (8) 20 amp manual reset type circuit breakers.

The load center shall be recessed and mounted to the upper portion of the forward wall in the L1 compartment and shall be located as “best fit” to avoid interference and maintain functionality. Any exposed wiring shall be contained within conduit to ensure safety. The cutout shall be trimmed with trim-lock for a pleasing appearance.

ELECTRIC CORD REEL

Three (3) Hannay model #ECR-1618-17-18 series electric rewind cord reel(s) shall be installed on the apparatus as specified.

There shall be an extended roller assembly with lift bar shall be provided on the outside cord reels to guide the cord on and off of the spool to prevent chafing on the body or opening. There shall also be a cord stop supplied. The reel shall come equipped with 200 feet of yellow 10-3 electrical cord.

A weather resistant push button switch to activate the rewind shall be located next to the reel. The switch shall be labeled “CORD REEL”.

The cord shall be hardwired to a Circle D remote power distribution box with (4) four NEMA Fire power single receptacles. The distribution box shall be stored in a mounting bracket when not in use. The box shall be equipped with a light to indicate when distribution box is energized.

The distribution box shall be equipped with the following receptacles:

- Position 1: Fire Power
- Position 2: Fire Power
- Position 3: Fire Power
- Position 4: Fire Power

Consideration will be given to changing one or more positions to standard 110v house power at the Pre-Construction conference.

Mounting brackets shall be installed in locations similar to previous units.

The cord reels will be located in the L1 and R1 compartments mounted to the ceiling behind the lift up door.

GENERAL INFORMATION

The aerial ladder assembly shall be a four (4) section telescoping steel ladder, with a pre-piped waterway, steel turntable, torque box and outriggers. Aluminum ladders will also be considered.

INTENT OF AERIAL SPECIFICATIONS

The intent of these specifications is to describe a telescoping elevating ladder of the true ladder type. It shall consist of four (4) steel ladder sections, a steel turntable, a tube torque box and four outriggers. The rated vertical height of the unit shall be a minimum of 103' and the rated horizontal reach shall be a minimum of 96'. Aluminum ladder designs will also be considered.

It is the intent of the purchaser that the device must meet all the requirements of the National Fire Protection Association's (NFPA) 1901 standard, 2009 edition. It is also the intent of the purchaser to secure a fire service proven piece of apparatus that shall be manufactured in the U.S.A.

It is not the intent of the purchaser to deviate from this requirement; therefore, ladders attached to booms, whether solid or lattice, or articulating arms shall not be considered as meeting these specifications or the intent of these specifications.

DESIGN STANDARDS

The design criteria of the unit shall be to create a structure and system that emphasizes safety, product reliability, and ease of operation. These criteria are:

1. All structural load supporting elements of the aerial ladder that are made of a ductile material, shall have a design stress of not more than 50 % of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the American National Standards Institute (ANSI) and the current National Fire Protection Association (NFPA) 1901 standard.

2. The aerial device shall be capable of sustaining a static load one and one-half times it's rated tip load capacity (live load), in every position in which the aerial device can be placed when the vehicle is on a firm and level surface.

3. The aerial device shall be capable of sustaining a static load one and one-third times it's rated tip load capacity (live load) in every position in which the aerial devices can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

4. The hydraulic system shall be designed so that if a failure of any component or assembly within the system occurs, a single point failure of the entire system will not occur.

5. The aerial shall be capable of operating with a rated tip load of either of the two of the following conditions:

A. Conditions of high wind of up to 50 mph.
B. Conditions of icing, up to a coating of .25” over the entire aerial structure.

The manufacturer shall state what wind and ice conditions their aerial device is capable of operating without reducing the rated tip load. NO EXCEPTION!

All of the design criteria must be supported by the following test data:

1. Strain gauge testing of the complete aerial device certified by a Registered Professional Engineer.

2. Analysis of deflection data taken while the aerial device was under test load.

3. Hydraulic component operating and burst strength testing.

MATERIAL STANDARD

All structural materials used in the aerial shall be certified by the mill of the manufactured material. Materials that are not certified shall not be acceptable.

GENERAL APPARATUS DESCRIPTION

The unit shall be designed to conform fully to the "Aerial or Quint Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), shall include the general requirements as stated in Chapter 4 for Aerial or Quint Apparatus.

AERIAL LADDER MOUNTING

The elevating aerial ladder turntable shall be rear mounted thus providing the following vehicle benefits:

1. Improved mobility vs. mid-ship mounted units, due to shorter overall travel length and wheelbase.

2. Increased compartmentation, in body, resulting from ladder being raised to clear the cab.

3. Shorter vehicle wheelbase.

4. Shorter overall length of vehicle.

HEIGHT AND REACH

The height of the unit shall be a minimum of 103’ as measured by NFPA 1901 requirements, which requires the rated vertical height of an aerial ladder shall be measured in a vertical plane with the ladder at maximum elevation and extension from the outermost rung of the outermost fly section to the ground. The vendor will state the height of the unit as measured by NFPA-1901 standards.

The horizontal reach of the unit shall be a minimum of 96' as measured by NFPA 1901 requirements, which requires the rated horizontal reach of an aerial ladder shall be measured in a horizontal plane from the centerline of the turntable rotation to the outermost rung on the

outermost fly section with the aerial ladder extended to its maximum horizontal rear. The vendor shall state the reach of the unit as measured by NFPA-1901 standards.

WELDMENT FIXTURES

To ensure exact tolerances between parts and part interchangeability, all weldments shall be manufactured in fixtures. To further insure weld integrity in all weldments, all ladder fixtures must be able to infinitely rotate about their main axis, to position the weldments in the number 1 flat welding position resulting in maximum weld penetration in the welded material for both the tack and final weld process of the ladder.

AMBER CEILING BEACON

A chassis supplied amber LED light shall be located on the cab's ceiling. This light shall be a flashing self-contained light that shall be activated when the aerial is raised and the outriggers are deployed.

HYDRAULIC SYSTEM

The hydraulic system shall provide power to the entire aerial device as efficient as possible without the use of a hydraulic cooler.

A load sensing axial piston hydraulic pump shall be provided. The pump shall be capable of operating under any rated ladder tip load condition and aerial device position at normal engine idle or governor controlled fast idle. The hydraulic pump shall be capable of generating sufficient flows to allow multiple aerial functions without significant loss of speed.

A hydraulic system relief valve as well as individual circuit relief valves shall be provided to prevent damage to any function or circuit. The relief valve shall have a relief spring to ensure proper function and product reliability.

POWER TAKE OFF (PTO)

The apparatus shall be equipped with a power shift PTO driven by the chassis transmission. An indicator light shall be located in the cab to show when the PTO is engaged. The PTO shall only engage with the parking brake applied and the transmission in neutral or drive if the fire pump is engaged. The PTO shall be a heavy-duty pressure lubricated and cooled unit for extended operations.

A master "Ladder Power" switch shall be provided for engagement of all ladder hydraulic functions and 12-volt power. The emergency pump circuit shall be controlled separately.

AERIAL HOURMETER

An aerial hour-meter shall be installed in the cab adjacent to the aerial power switch. The hour-meter shall be wired to the aerial PTO circuit to record hours of PTO operation for the aerial device. The hour-meter shall aid in scheduling preventative maintenance as outlined in the operator's manual.

There shall be an additional Hobbs Hour meter installed on the aerial pedestal. This hour meter shall read aerial operation (hours with aerial out of cradle).

ENGINE HIGH IDLE ACTUATOR

The high idle actuator shall be used to raise the engine RPM to a preset level for proper aerial operation. The high idle switches shall be located in the chassis cab, at the outrigger control stations and the aerial control station or stations.

For the safety of personnel and equipment, the high idle system shall not activate unless the transmission is in neutral.

HYDRAULIC OIL RESERVOIR

An approx. 40 gallon hydraulic oil reservoir shall be provided to supply the needs of the hydraulic system. The tank shall be constructed from 10 gauge steel, which shall be welded at all interior and exterior seams.

A 1-1/2" gated suction line shall be provided between the oil reservoir and the primary hydraulic pump. The tank fill shall be provided with a strainer screen and vent cap. There shall be a sight level gauge for checking fluid levels.

The tank shall be cleaned and free from all contaminants before adding any fluid.

HYDRAULIC SYSTEM FILTRATION

Outgoing and return line filtration shall be provided. The pressure and return filters shall be easily accessible for maintenance.

Outgoing filtration shall be in the form of a pressure line filter installed between the hydraulic pump and entrance to any system components. The filter shall have an absolute rating of ten (10) microns. The pressure filter shall have a bypass circuit protected by a 90-psi check valve, which shall be installed around the pressure filter. The pressure line filter shall be required even if a suction line filter is provided in the reservoir due to the suction line filter's inability to trap contaminates entering the system.

A filter condition indicator shall be provided.

The return line flow shall be filtered by means of a return line filter. This filter shall have an absolute rating of ten (10) microns.

EMERGENCY HYDRAULIC PUMP SYSTEM

In the event of failure of the main hydraulic pump or vehicle engine, the unit shall be equipped with an emergency hydraulic pump.

The pump shall be plumbed into the hydraulic system and be electrically driven from the chassis batteries. The emergency pump shall be capable of limited functions of the ladder and

outriggers to stow the unit. The pump shall be controlled from the right and left outrigger, and the turntable control stations with spring loaded momentary contact switches.

The emergency pump shall have a separate hydraulic oil supply line, attached directly to the hydraulic oil reservoir. A shutoff valve shall be provided and a check valve shall be incorporated on the pressure side of the pump.

HYDRAULIC HOSE, TUBING AND FITTINGS

All hydraulic steel tubing, hydraulic rubber covered wire-braided hoses, and hydraulic fittings/ adapters shall have a minimum burst pressure rating of four times the operating pressure. Hoses and tubing shall be properly sized to minimize heat buildup during extended periods of operation. Hoses and tubing shall be properly sized to minimize flow restrictions.

All hydraulic hose shall have a tube and cover constructed of Nitrile elastomers and shall have braided/spiral wire reinforcement capable of maintaining a 4:1 safety factor in all areas of the hydraulic system. The hose shall meet the appropriate SAE performance specifications: 100 R2 or 100R12.

The hydraulic fittings shall utilize O-ring face seal technology to minimize fluid leakage and improve serviceability.

OUTRIGGER/AERIAL INTERLOCK

The aerial hydraulic system shall include an interlock feature that will prevent the accidental operation of the outriggers during aerial operation. This interlock shall also prevent accidental operation of the aerial device prior to the outriggers being properly deployed.

In the event of electrical failure, the operator shall be able to override the hydraulic system to operate the aerial device or outriggers for continuous, uninterrupted operation.

LIFT, EXTENSION AND ROTATION HYDRAULIC CONTROL VALVE

The lift, extension, and rotation systems shall be controlled by a proportional, load sensing directional control valve. This valve shall be of a modular construction that simplifies troubleshooting, minimizes downtime, and simplifies field service. The main control valve shall be positioned at the turntable control console for direct manual control of each aerial function.

TORQUE BOX

A torsion box sub-frame shall be installed over the chassis frame rails. The torque box assembly shall be capable of withstanding torsion and bending loads. The torque box shall be bolted to the chassis frame with .75” SAE grade 8 bolts. The torque box shall be constructed of 0.375” steel bottom plate and a stiffened diaphragm top plate.

The torque box shall be designed to enclose the ground ladders. It shall be painted red in the rear center compartment.

OUTRIGGER SYSTEM HYDRAULIC CONTROL VALVES

A directional control valve that is designed for parallel hydraulic circuit operations shall control the outrigger cylinder system. This valve shall be modular in design so that individual sections can be replaced in the field, rather than complete valve assemblies, thus reducing maintenance costs. Each valve shall be equipped with a heavy-duty electric solenoid for electric control of the outrigger from the remote operator's station.

OUTRIGGER CONTROLS

Two (2) illuminated electronic outrigger control stations shall be provided, one (1) on each side of the rear of the vehicle. The outrigger control joysticks shall be enclosed in a recessed compartment to protect each control from damage or accidental movement. The controls shall be located such that the operator can see the outrigger he/she is operating. The control panel shall be color coded separately for front and rear outrigger functions. Body designs that block the view of the outriggers from the control station shall not be acceptable.

Each outrigger control function shall be operated independently, so that the vehicle may be set up in restricted areas or on uneven terrain.

The left outrigger control station shall incorporate the following:

- Outrigger joystick controls
- Outrigger deployed indicator lights
- Fast idle switch
- Emergency pump control switch
- Warning decals
- Hydraulic pressure gauge

The right outrigger control station shall incorporate the following:

- Outrigger joystick controls
- Outrigger deployed indicator lights
- Fast idle switch
- Emergency pump control switch
- Warning decals

FRONT OUTRIGGERS

Two (2) front "H" style "out and down" outriggers shall be provided immediately forward of the Aerial torque Box. This design shall provide proper stability and minimize front axle and suspension loads while the aerial device is in operation over the front of the apparatus.

The extension of the horizontal outrigger beams shall provide a minimum 14’ outrigger stance. The horizontal outrigger beam shall be fabricated from high strength steel plates with an RBM of 545,000 ft-lb.

For ease of maintenance, the outrigger extension cylinders shall be equipped with end connections, which do not require removal of body panels to remove pins or the extension

cylinders. The outrigger jack cylinders shall be removable by unbolting the jack tower cap and lifting the cylinder out vertically.

REAR OUTRIGGERS

Two (2) "H" style out and down rear outriggers shall be mounted underneath the chassis frame to allow more ground ladder storage above the frame. The outriggers shall provide a 14’ stance with 10 degrees of leveling capability for operations in hilly terrain.

For ease of maintenance, the outrigger extension cylinders shall be equipped with end connections, which do not require removal of body panels to remove pins or the extension cylinders. The outrigger jack cylinders shall be removable by unbolting the jack tower cap and lifting the cylinder out vertically.

Each jack cylinder shall have a minimum 4" bore with a 3" rod. The jack cylinders shall be equipped with integral (on the cylinder) holding valves, which shall hold the jack cylinder in either the stowed position or the deployed position should a hydraulic line be severed at any point within the hydraulic system. Each jack cylinder shall also have a thermal relief system that shall prevent the cylinder fluid pressure from rising due to fluid temperature increase.

The vertical jack cylinders shall be inverted allowing the cylinder rods to be enclosed within the outrigger beam jack towers, therefore preventing them from being nicked or scored during operations on the fire ground.

In order to provide faster setup time for the aerial on the fire ground, and to eliminate the possibility of damage to the housing should the outriggers be retracted with the jack pins left in, designs that require the use of jack pins shall not be acceptable. .

For ease of maintenance, the outer jack tube shall be designed so that the cylinder can be removed from the top. Designs that require the outrigger beams to be removed or the jack cylinder positioned over a pit for jack cylinder removal, shall not be acceptable.

OUTRIGGER PADS

A permanently attached self-centering 12” minimum steel outrigger pad, shall be provided on each outrigger. The pad shall swivel and require no adjustment during outrigger set-up.

The outrigger pad shall be attached without the use of a bearing type swivel due to maintenance required on this design.

AUXILIARY OUTRIGGER GROUND PADS

Four (4) auxiliary outrigger ground pads shall be provided for additional load distribution. Each ground pad shall measure a minimum of 2" x 23" x 23" (529 sq. in.) and shall be fabricated of Composite Plastic. Each ground pad shall be equipped with a handle for easy use.

OUTRIGGER/AERIAL INTERLOCK SYSTEM

An interlock system shall be provided between the outriggers and aerial device that prevents the operation of the aerial until the operator places all jacks in the load-supporting configuration. All jacks shall be equipped with a ground force sensitive switch that closes only when the jack is firmly in contact with the ground.

Until all the switches close, electrical and hydraulic power shall not be transmitted to the turntable, hence preventing aerial operation. Green indicator lights shall be provided on the outrigger control panel to indicate that the outrigger foot is in firm contact with the ground and in a load supporting position.

OUTRIGGER DEPLOYMENT WARNING ALARM

An outrigger deployment-warning device shall be provided to warn personnel in the vicinity of the apparatus that the outriggers are in motion. Whenever an outrigger control handle is utilized, the device shall produce a pulsing tone. When the outrigger control handle is released to its neutral position, the signal shall cease.

OUTRIGGER LIGHTING AND REFLECTIVE STRIPING

Each outrigger shall be equipped with the following light and reflective striping package:

• Reflective Chevron striping shall be applied on both sides of the horizontal outrigger beams. White reflective striping shall be provided on the vertical jack towers.
• There shall be an LED ground illumination light located at each outrigger location to illuminate the footpad area.
• One (1) 3" x 5" rectangular, red flashing LED light shall be installed on each forward and rearward facing vertical surface of the outrigger beams.
• Both the foot pad illumination lights and the flashing outrigger lights shall be activated by the aerial power switch.

TURNTABLE ACCESS SAFETY BAR

Two (2) Fire Research "Man Saver" turntable safety bars shall be installed. The safety bars shall open either upward or inward and be spring loaded to automatically return to the horizontal closed position. The safety bar assembly shall be made of aluminum and stainless steel with foam padding and a bright yellow cover on the bar. The cover shall be waterproof, mildew resistant, and made of reinforced rip stop vinyl.

TURNTABLE/TURNTABLE DECK

The turntable shall be a fabricated steel weldment designed for the rotation and elevation of the ladder sections and platform. It shall consist of the following:

A steel bearing plate and matching top plate shall be machined to insure proper fit to the rotation bearing. Manufactures that do not mill both bearing surfaces shall not be acceptable.

Embossed aluminum diamond plate deck shall cover the entire turntable frame, providing a walking surface.

An embossed aluminum diamond plate access step shall be mounted at heel of the ladder.

All handrails shall be a minimum of 42” high. For ease of grip, the handrail shall be manufactured from 1-1/4" O.D. knurled stainless steel with reinforced triangular mounting feet.

Turntables with the drive motor or breathing air bottles mounted in any walking areas (front or rear) of the turntable shall not be acceptable.

A full size turntable deck shall be provided to maximize the safe work area around the control console and to allow unimpeded access to and from the aerial ladder and the ground.

CRADLE ALIGNMENT INDICATOR ARROWS

Stainless steel arrows shall be installed on the turntable surface in view of the operator when standing at the turntable control station. The arrows will assist the operator in indicating the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be overlaid with white Scotch-lite material and suitably illuminated for nighttime operation.

Mechanical fasteners shall be used for installation.

HYDRAULIC, ELECTRIC AND WATER SWIVEL

Hydraulic power to the turntable hydraulic circuits shall be provided through a three port, high pressure, hydraulic swivel that permits 360-degrees of continuous turntable rotation.

A collector ring assembly shall provide electrical power to the turntable electric circuits. The collector rings shall be used for electrical ground, ladder control functions, and a 110-volt A. C. system during 360-degrees of continuous turntable rotation. The collector ring assembly shall have sufficient rings to provide power, ground, control functions and four spare circuits.

Water shall be transferred to the aerial waterway by means of a five (5) inch water swivel enabling 360-degree continuous rotation of the turntable.

AERIAL TRAVEL SUPPORT

A heavy-duty rest shall be provided to support the aerial in the travel position. The base of the travel support shall include a rubber isolator and spring mounted pivoting arrangement to cushion loads on ladder rest. Stainless steel bedding plates shall be attached to the aerial base section to protect the aerial when the unit is in the travel position.

ELEVATION SYSTEM

A ladder lift cylinder cradle arrangement shall be provided to raise and lower the ladder. The lift cradle shall provide for machined pin connections between the lift cylinders, turntable and the ladder. The lift cradle system shall incorporate torsional bracing for the ladder, readily accessible cylinder removal and eliminate side loads to the ladder side trusses.

Two (2) double acting lift cylinders shall be attached between the turntable and the base section creating a better lifting geometry resulting in lower hydraulic operating pressures and improved load distribution on the base ladder section. The cylinders shall function only to elevate the aerial device and not as a structural member to stabilize the ladder sideways. The lift cylinder trunnion shall be attached to the ladder lift cradle and the rod shall attach to the turntable utilizing self-aligning swivel bearings which prevent side loading on the lift cylinders resulting in longer cylinder seal life. They shall provide smooth precise elevation from 10 degrees below horizontal to 75 degrees above horizontal. The lift cylinders shall have a 6" internal bore, a 4" diameter rod.

The lift cylinders shall be equipped with integral (on the cylinder) holding valves, which prevent the ladder from lowering should a hydraulic line be ruptured at any point within the hydraulic system. They shall also have a manifolded line with velocity fuses between the cylinders to prevent uneven cylinder lift.

LADDER INTERLOCK SYSTEM

A limit switch at the aerial travel support shall be provided to prevent operation of the outriggers once the aerial device has been elevated from the nested position.

EXTENSION/RETRACTION SYSTEM

A dual system of hydraulic cylinders and cables shall provide full power operation of the extension and retraction modes. Each system shall be capable of supporting the ladder in the event of failure of one of the systems. The cylinders shall be used to extend and retract the inner mid-section and a cable system shall be used to extend outer mid and the fly section.

The cable system shall utilize two (2) extension cables on the inner mid and (2) extension cables on the outer mid and two (2) extension cables on the fly. The cables shall have a safety factor based on breaking strength of 8:1.

In order to increase cable life, the ratio of sheave diameter to cable diameter shall be a minimum of 16 to 1.

A stroke multiplier cable system shall be provided as it reduces cylinder weight, shifts the ladder center of gravity toward the heel pin during extension, improves overall vehicle stability and does not subject the cylinder to buckling forces caused by normal ladder loads.

EXTENSION INDICATOR

The base section handrails shall be provided with red Scotch-Lite reflective striping and numbers to indicate the extension of the aerial device. The stripes and numbers shall be spaced to indicate each 10 feet of aerial extension beyond the fully retracted position. An additional stripe shall be provided between the numbered stripes to indicate each 5 feet of aerial extension.

LADDER SLIDE MECHANISM

Two (2) roller assisted slide pads shall be provided between each ladder section. This roller assembly shall consist of lubrication free, nylatron rollers and pads. With this slide roller assembly, the rollers will maintain contact with each ladder section at all times, as it extends and retracts under normal loading of the ladder. This shall dramatically reduce the brake away force required with designs that utilize wear pads alone. This shall provide the maximum friction free extension and retraction for the ladder. The roller assisted slide pad assembly shall be mounted in a pivoting housing that can be removed from the ladder sections by removing a single pin. This shall be achieved without the removal or disassembly of any of the ladder sections. This design shall provide a lubrication free device. (NO GREASE).

Side roller assemblies shall be provided to control side to side movement between the ladder sections during extension and retraction.

LADDER CABLE AND HOSE ROUTING SYSTEM

The lines to the ladder tip shall be enclosed and protected from the turntable to the ladder tip. The lines shall be routed and horizontally guided between the ladder section side rails to minimize obstruction to climbing areas.

Ladder designs in which electrical lines, air hose lines or hydraulic lines routed over the rungs are not acceptable due to the reduction in climbing area.

ROTATION SYSTEM

A minimum 45.5" external tooth monorace bearing shall be provided for smooth 360-degree continuous rotation and sufficient strength. The inner and outer race of the bearing shall be bolted to the open base and turntable support plates using .75" diameter grade 8 bolts. All bearing bolts shall be accessible from the upper side of the turntable for ease of access to inspect and torque the bolts.

Both upper and lower bearing surfaces shall be milled to ensure a true mounting surface for the rotation bearing. Units that weld the bearing to their mounting plates shall not be acceptable due to the tremendous cost and down time involved in replacing a damaged or defective bearing.

A dual hydraulic driven planetary swing drive system shall provide smooth and precise rotation.
A spring applied, hydraulically released, disc type brake shall be provided on each gearbox to provide positive braking of the turntable assembly against reactionary forces such as water and gravity. The planetary drives shall be mounted using an eccentric ring to provide for minimal gear backlash in the drive system. The planetary drives shall be positioned on the turntable so they shall not obstruct any walking area or stepping surface on the turntable deck.

ROTATION SAFETY SYSTEM

The Rotation Safety System shall be designed to prevent the operator who has primary operational responsibility from rotating the aerial device into an overturning mode. This system senses outrigger and outrigger jack positioning in conjunction with the aerial device movement.

If any outrigger beam is not fully extended, the "Outrigger Short Set" indicator light on the control console shall remain illuminated. The aerial device operator will then be required to engage the "Outrigger Short Set Override" switch in order to lift the aerial device from the travel rest.

If the aerial device operator attempts to rotate the aerial device (in excess of approximately 5 degrees beyond vehicle center) towards the side of the vehicle in which the outriggers are not fully deployed, the Rotation Safety System shall sense this fault and prevent the aerial from rotating further in said direction. At this point only rotation to the fully deployed outrigger side shall be allowed.

CAB/BODY AVOIDANCE SYSTEM

A fully profiled cab/body avoidance system shall be integrated into the rotation and ladder lower functions. The system shall serve to alert the aerial device operator of an impending collision with the vehicle cab or other portion of the vehicle body within 360 degrees of rotation when operating at lower angles of elevation. The system shall alert the operator with an audible alarm and illuminate a flashing indicator light at the aerial control station(s). The alarm(s) shall stay active so long as the ladder remains in the potential contact zone area. Should the operator ignore these warnings, the system shall override the appropriate operator input command(s) and automatically decelerate the rotation and ladder lower functions to a complete stop prior to ladder contact with the vehicle. A momentary contact closure shall be provided to allow the system to be overridden. The system shall allow for free rotation and elevation away from the contact zone. The system shall also be disabled when the ladder is aligned with the docking cradle.

LADDER SECTION CONSTRUCTION

The elevating ladder shall consist of four (4) steel ladder sections referred to as the base section, inner mid-section, outer mid-section and fly section. The design and construction criteria for each ladder sections shall be:

• Fabricated using high strength steel, welded together to form a structural unit.
• Welded by welders that have been certified in accordance with the American Welding Society Standard specifications.
• Constructed on an infinitely rotating assembly fixture to ensure uniformity and interchangeability.
• K braced at each rung to minimize side deflection of the ladder.
• All rungs shall be 1-1/4" in diameter, spaced at 14"centers.
• All rungs, K-braces, and diagonals shall be positioned so that they are continuously welded to the ladder section in the number one welding position.

Each rung shall be equipped with a heavy duty serrated, replaceable rubber sheath to provide an anti-slip surface for firefighting personnel. For additional safety, the covers shall be constructed from a rubber to allow ice buildup to easily break off when the rung is stepped on by firefighting personnel. This shall be an added safety feature during water tower operation in cold weather conditions.

Ladder designs that do not utilize rubber covers shall not be acceptable due the high cost and difficulty to replace the anti-slip surface and the inability to provide a safe surface during icing conditions.

The ladder handrails and diagonal material are to be constructed from square or rectangular tubing, which provide a larger welding surface were the materials are attached to each other. Use of round material for ladder bracing is not desired due to the reduced amounts of weld associated with round materials.

LADDER SECTION DIMENSIONS

All vendors shall state in the space provided below their dimensions on the unit proposed. Dimensions proposed must equal or exceed these specified. All Dimensions are from top of rung to top of handrail. All width dimensions are inside to inside of handrails.

Handrail Height Width
Base Section 26.25" 39.00”
Inner Mid 22.75" 32.25"
Outer Mid 20.25" 26.50"
Fly 17.50" 21.50”

OVERLAP SURFACES BETWEEN SECTIONS
Base to Inner Mid Fly Section 90.75"
Inner Mid Fly to Outer Mid Section 90.75"
Outer Mid Fly to Fly Section 90.75"

LADDER EGRESS

The fly ladder tip shall be equipped with a bolt-on section to make the transition to and from the ladder easier. The egress shall have an angled section which includes ladder rungs and an extended radius handrail to provide additional safety when climbing to and from the ladder. The bolt-on section shall be easily replaced if damaged during firefighting operations. This tip will be painted safety yellow.

REMOVABLE RUNG ASSEMBLY

For ease of service, the first rung of each section shall be integrated with the rear ladder side guides and vertical load transfer mechanism. The assembly shall be removable from the rear of the section by removing four bolts to allow for easy service access to slide pads and rollers.

FLY TIP STEPS

Two (2) folding steps shall be conveniently located at the end portion of the fly section. These shall be used for one person to place their feet so that they are positioned parallel to the ladder. The steps shall fold into proper position for usage and fold toward the sides of the ladder when not in use to provide adequate clearance when the ladder is being climbed. The steps shall be placed approximately 70" & 98" from the center of the last rung toward the base of the aerial.

AERIAL WATER SYSTEM

The aerial waterway system shall be capable of being supplied by an external water source with the inlet on the rear of the apparatus.

4" GATE INTAKE VALVE MANUAL DRIVE

There shall be an Elkhart 4" gated intake valve with hand wheel installed on the aerial waterway rear inlet with a dial indicator. The valve shall have a built-in pressure relief valve, sealed gear drive, bronze body construction, and an indicator light package. There shall also be installed with this valve one-(1) air bleeder valve. There shall be a push pull T handle linkage to activate the aerial drain.

All piping from the inlet at the rear of the apparatus to the riser pipe below the turntable swivel shall be 4" Schedule 40 aluminum 6061T pipe. Piping at the rear of the apparatus shall terminate in 4" NST threads. A 4" water swivel shall be located in the riser pipe from the tee permitting 360-degree continuous rotation of the ladder.

The termination shall include the following components:

• One (1) 4” NST adapter.
• One (1) TFT 4” NST female by 4" Houston Thread swivel by 5”Storz cast aluminum 30 degree elbow.
• One (1) 5” female Storz self-venting cap, secured by a chain.
• A 4" heel pin swivel connection between the ladder waterway and the turntable swivel permitting water tower operations from -10 to +75 degrees shall be provided.
• A 1-1/2" adjustable relief valve shall be located beneath the turntable to protect the water system from excessive pressures.

AERIAL WATERWAY FLOWMETER

The apparatus shall be equipped with a Class 1 Flow minder, model #FMS at the aerial discharge waterway to give the aerial operator an indication of actual volume of water (in gallons per minute) being discharged through the line. It shall also be capable of showing total flow at the touch of a button. The flow meter will be mounted in the turntable control console.

Each Flow minder system shall consist of:

• A digital display shall be wired to the flow transmitter to show waterway discharge flow.
• A flow transmitter mounted in the discharge line piping between the pump and the discharge outlet. The transmitter shall consist of a weather resistant black composite housing with a stainless steel, durable paddle wheel. The only part inserted into the water flow path shall be the paddle wheel.
• The flow meter shall be checked and calibrated prior to delivery of the apparatus.
• An anodized aluminum telescopic waterway shall be mounted beneath the center of the aerial ladder. The waterway shall have a 5" base section tube, 4-1/2" lower mid-section tube, 4" upper mid-section tube and a 3-1/2" fly section tube.

AERIAL WATER SYSTEM

A minimum 5" water swivel shall connect from the base waterway to the aerial waterway. The water swivel shall permit full operation at any elevation of the aerial device. One (1) 4" pipe shall be provided to transfer water from the swivel to the monitor. The aerial waterway pipes shall be designed to reduce friction loss in the waterway. All aerial waterway piping shall be completely removable for service or replacement. Aerial designs in which the waterway is welded or utilized for structural integrity of the aerial shall not be acceptable.

MOVABLE MONITOR FEATURE

The aerial ladder waterway monitor shall be capable of being positioned at either the fly section for water tower operation or at the next lower ladder section for rescue.

The monitor position shall be controlled by a stainless steel spring loaded, lift to release mechanical lever located on the monitor carriage. The system shall lock the monitor to the outer mid-section for rescue, or to the fly section for water tower operation. Lights at the control console shall indicate the operating position of the monitor. An alarm shall sound at the fly tip and control console when the lever is not in a latched position. Due to alignment problems, there shall be no pins on the ladder to position the monitor.

The monitor shall be remotely operable from either position and shall transfer the electrical power and controls automatically. Due to problems associated with aligning electrical connectors used to transfer power between rescue and water tower positions, the power transfer shall be achieved by a cable carrier system.

WIRELESS REMOTE CONTROLLED MONITOR

An Akron model #3578 2000 gpm wireless remote controlled monitor, constructed of lightweight Pyrolite, shall be installed forward of the platform handrails and connected to the telescoping aerial waterway. The monitor relay box shall be located adjacent to the monitor, and shall be easily accessible for service.

The monitor and nozzle functions shall be controlled from the tip of the aerial and from any aerial control station(s) specified. Each monitor and nozzle control station shall consist of three

(3) Individual spring loaded, self-centering, and weather resistant toggle switches.

The monitor shall have a vertical sweep of 135 degrees, and a horizontal sweep of 180 degrees (90 degrees to each side of the aerial center line).

An Akron Brass Akromatic 1250 electric combination fog and straight stream nozzle with automatic flow mechanism that provides a flow range of up to 1250 gpm at 80 psi shall be provided. The nozzle shall be constructed of durable, lightweight Pyrolite and shall have electric pattern selection from straight stream to wide fog controlled by a 12V motor and linear ball screw, a manual override pattern control knob, and a built-in stream shaper. Comparable nozzles can be discussed at the Pre-Construction conference.

The monitor will auto stow when the ladder is centered in the cradle and at 10 degrees or less elevation angle.

AERIAL AUXILIARY TIP DISCHARGE

A 2-1/2 discharge outlet shall be provided at the aerial device tip to be used as a pre piped extended or elevated discharge outlet and/or standpipe connection. The discharge outlet shall be supplied by the integral aerial waterway system. A manually operated 2-1/2" quarter-turn ball-type discharge valve shall be installed at the end of the aerial waterway system. A 2-1/2" swivel elbow shall be provided for the discharge outlet. A 2-1/2" NST X 1-1/2" NST chrome reducing adapter and 1-1/2" NST chrome cap with chain shall be included.

A 3" gear-operated handwheel-controlled butterfly valve shall be provided between the end of the aerial waterway system and the master stream monitor to regulate flow to the master stream monitor.

LADDER CAPACITIES

The following ladder tip load capacities shall be established with the truck level; the outriggers fully extended and lowered to relieve the chassis weight from the axles. All capacities are based upon 96' of horizontal extension and 360 degree rotation.

LADDERS CAPACITIES IN POUNDS

(Uncharged Waterway)
Elevation in Degrees

SECTION	-10-20	20-30	30-40	40-75
Base	-	250	250	250
Inner Mid	-	250	250	250
Outer Mid	-	-	-	250
Fly	750	750	750	750

LADDER CAPACITIES IN WATER TOWER OPERATION

Elevation in Degrees

SECTION	-10-15	15-25	30-40	40-75
Base	-	250	250	250
Inner Mid	-	250	250	250

Outer Mid	-	-	-	250
Fly	500	500	500	500

Due to the demand of firefighting situations, units that do not allow these aerial and water tower capacities will not be acceptable.

WATER TOWER OPERATION

The ladder and water system shall be designed to permit the following flows:

• 1000 GPM at 90 degrees to ladder centerline either side.
• 1000 GPM parallel to ladder centerline and as far below horizontal as nozzle design allows.

AERIAL CONTROL STATION

There shall be an aerial control station located at the turntable made of treadplate. All elevation, extension and rotation operational controls shall operate from this position. These controls shall be arranged to permit the operator to regulate the speed of these operations within the safe limits as determined by the manufacturer. Load instruction plates shall be located at the control station to show the recommended safe load of the ladder. The control devices shall be clearly marked and suitably lighted. The lid of the console shall be wired to the open door circuit on the chassis

TURN TABLE CONTROL STATION

The control station shall be located on the left side of the turntable, as the operator is facing the tip of the ladder (Driver's side of the apparatus), in order to provide increased visibility of the ladder tip while operating the controls. The lower part of the console shall be angled away from the operator, to provide as much foot room as possible for the operator.

An access panel door shall be provided on the front of the console and an access door at the rear of the console to provide complete service to the electrical and hydraulic components mounted inside the console.

The console and turntable working areas shall be illuminated for night operations, and shall have the following controls and indicators clearly marked:

• Three (3) hydraulic ladder control levers.
• A locking aerial control joystick which electrically opens the aerial control valve, shall protect against accidental movement of the control handles.
• Rung alignment indicator light for ladder climbing operations on base section near console.
• Cradle alignment indicator light on base section near console.
• Engine high idle control switch.
• Emergency pump power switch.
• Hobbs Hour meter
• Short Jack Indicator Lights.

- Outrigger Short Jack Override Switch.
- Intercom controls on base section near console.
- Bubble type angle indicator on base section near console.
- Illuminated load chart on front of console.
- Protected console cover over controls.
- Monitor Controls.
- Tracking Light Switch.
- Monitor Stowed Indicator.
- Monitor Latched Indicator.
- Flow minder Display (If Selected).

OPERATIONS ON GRADES

The aerial unit shall be capable of operating with 100% of rated capacity on a slope of up to 10 degrees. Operating capacity shall be reduced to 50 % capacity for operating on a slope of 11 degrees to 13 degrees. Operation beyond a 10 degree slope shall be at operator's discretion. Devices that cannot provide this leveling capability are not acceptable.

PAINTING

Prior to any painting, all weldments such as the outrigger beams, torque box, turntable, and aerial ladder sections shall be shot blasted, cleaned and inspected to insure the removal of any surface imperfections and to insure superior paint adhesion to the metal.

The entire painting system shall utilize a single manufacturer's paint for compatibility between primers and finished coats. All painting shall be done in atmosphere controlled spray booths. The weldments will then be primed with a Ditzler PPG zinc corrosive inhibitor and a Ditzler (PPG) Epoxy Primer. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the aerial unit shall be thoroughly cleaned, conforming to good painting practices.

AERIAL DEVICE AND SIGN BOARD PAINT

The finished paint color shall be PPG 926235 white enamel, allowing easy touch-up after extended use.

If the aerial device is aluminum, it shall not be painted.

CRADLE, LIFT CYLINDER

The finished paint color shall be PPG 926326 RED enamel, allowing easy touch-up after extended use.

AERIAL TRAVEL REST PAINT

The finished paint color shall be PPG 9000 black enamel, allowing easy touch-up after extended use.

AERIAL LADDER TIP & NOZZLE TROLLEY PAINT

The finished paint color shall be PPG Safety yellow enamel, allowing easy touch-up after extended use.

OUTRIGGER BEAM PAINT

The finished paint color shall be PPG 926326 RED enamel, allowing easy touch-up after extended use.

TORQUE BOX, TURNTABLE STRUCTURE AND CONTROL CONSOLE PAINT

The finished paint color shall be PPG 926326 RED enamel, allowing easy touch-up after extended use.

EXT/RET CYLINDER PAINT

The finished paint color shall be PPG 926326 RED enamel, allowing easy touch-up after extended use.

COMMUNICATION SYSTEM

An Atkinson communication system, or equal (approved by HFD), shall be furnished between the ladder tip and the turntable operator's position. The communication speaker at the ladder tip shall require no operator attention to transmit or receive. The transmitting receiving volume controls shall be located inside the turntable operators console cover.

AERIAL SPOTLIGHTS

All aerial spotlights lights shall be 12 volt, with on/off switches on each light. The lights shall be mounted below handrail height, so as not to increase the overall height of the vehicle.

TRACKING LIGHTS

Two (2) spotlights shall be mounted at the rear of the base ladder section, one (1) on each handrail. The spotlights shall be capable of swiveling 180 degrees and are to be used to direct light up the inside or outside of the ladder walkway.

TURNTABLE WORK LIGHTS

Four (4) On Scene Solutions, 9" Night Axe, LED turntable work lights shall be installed in the turntable step cover to illuminate the turntable area.

LADDER RUNG ILLUMINATION

Each climbing rung of the ladder shall be individually illuminated for night time operations utilizing photo-luminescent vinyl striping.

OUTLETS AT THE AERIAL TIP

One (1) 110-volt weatherproof outlet, Fire Power type and an environmental cover shall be furnished near the end of the fly section.

LADDER TIP QUARTZ LIGHTS

Two (2) Whelen Pioneer Plus, PFP1AC, single lamp, 120 volt, LED flood lights, with PBAPEDA pedestal mounts, shall be installed at the tip of the ladder, one (1) each side. The lights shall be wired to the aerial 110-volt circuit and shall be equipped with a separate switch. Lights shall be mounted on short stanchions.

LED LADDER LIGHTS

There shall be two (2) Whelen ION Red LEDs with clear lenses covers mounted in an aluminum housing provided at the tip of the ladder. These lights shall be mounted, one (1) each side of the ladder, near the tip and activate with the aerial master power switch. If the ladder master power switch is accidentally left on, these lights shall cease to flash upon release of the parking brake.

APPARATUS LEVEL INDICATOR

A bubble type level indicator shall be provided at the rear of the apparatus to assist in the aerial device setup. This device shall be mounted on pike pole door. The leveling indicator shall be backlit and color coded indicating the following conditions:

"Green" Safe Operating Zone.
"Yellow" Caution Operating Zone.
"Red" Do Not Operate Zone – Reposition Apparatus.

FORE/AFT LEVEL

An additional leveling indicator shall be furnished to measure fore and aft level of the vehicle.
The indicator shall be mounted on the left side torque box wall

AERIAL SIGN PANELS

There shall be a total of two (2) Aerial sign panels provided and installed on the outside of the aerial base section, one (1) each side, for fire department lettering. Each sign panel shall measure approx. 14" wide x 144" long.

AXE MOUNTING

There shall be a mount furnished for a flat head axe in the fly section of the ladder. The axe mount shall include a receptacle that will cover the entire axe head and a mechanical pin to secure the axe handle.

There shall be a mount furnished for a pick head axe in the fly section of the ladder. The axe mount shall include a receptacle that will cover the entire axe head and a mechanical pin to secure the axe handle.

PIKE POLE MOUNTING

There shall be a mount furnished in the fly section of the ladder for a pike pole. The mounts shall include restraints for both ends of the pike pole.

ROOF LADDER MOUNT

There shall be a mount furnished in the fly section of the ladder for a roof ladder. The mounts shall include restraints for both ends of the ladder.

ATTIC LADDER MOUNT

There shall be a mount furnished in the fly section of the ladder for an attic ladder. The mounts shall include restraints for both ends of the ladder.

LIFTING ANCHORS

Two tip anchors shall be provided at the end of the fly section with a total capacity of 500 lbs.

RESCUE ROPE ROLLER ASSEMBLY

The last rung of the aerial ladder shall be equipped with a removable rescue rope roller assembly. The assembly shall have a stainless steel shaft, dual tapered roller guide and two

(2) pivoting lifting lugs. The assembly shall be rated at 500 lb. lift capacity.

UNDERWRITERS LABORATORIES TESTING & CERIFICATION

GENERAL

The proposed unit shall be tested and certified for the apparatus manufacturer by Underwriters Laboratories Inc. (UL) Underwriters Laboratories Inc. (UL) is recognized worldwide as a leading third party product safety certification organization for over 100 years. UL has served on National Fire Protection Association (NFPA) technical committees for over thirty years. The testing company shall not be affiliated with the manufacture or repair of the apparatus.

INDEPENDENT TESTING TO BE PERFORMED

All work outlined in NFPA 1911, current Edition, including nondestructive testing, shall be conducted at the manufacturer's facility. In addition, the following test work, Certification Test sections of NFPA 1901, 2009 Edition shall be conducted.

a). 1-1/2 Times Rated Capacity on Level Ground Stability Test: A load of 1-1/2 times rated capacity (as specified by the manufacturer) shall be suspended from the tip of the aerial ladder, or the platform of the elevating platform, when it is in the position of least stability. If the manufacturer specifies a rated capacity while flowing water, then one times the water load and the worst case nozzle reaction shall be added to the stability test weights. The apparatus shall show no signs of instability. For a water tower, the stability test includes 1-1/2 times the weight

of the water in the system and 1-1/2 times the maximum nozzle reaction force when it is in the position of least stability.

b). 1-1/3 Times Rated Capacity on a 5 degree Slope Stability Test. A load of 1-1/3 times rated capacity shall be suspended from the tip of the aerial ladder, the platform of the elevating platform, or the tip of the water tower when it is in the position of least stability. The apparatus shall show no signs of instability.

c). A friction loss test shall be conducted for an aerial device equipped with a permanent water system and has a rated vertical height of 110 ft. or less. A flow test shall be conducted to determine that the friction loss in the water system between the base of the swivel and the monitor outlet does not exceed 100 psi with 1000 GPM flowing and the water system at full extension.

d). A maximum vertical height flow test shall be conducted to determine that the water system is capable of flowing 1000 GPM at 100 psi nozzle pressure with the aerial device at full elevation and extension. If the apparatus is equipped with a fire pump designed to supply the water system, the test shall be conducted using the onboard fire pump. The intake pressure to the fire pump shall not exceed 20 psi.

WRITTEN EXAMINATION AND TEST REPORT

A complete written Examination and Test Report for each aerial device inspection performed at the manufacturer's facility. The test report, as required by NFPA 1914, shall include the following test results.

A). Torque verification of all mounting bolts including bolt size, grade, and torque specification.

b). The following NDT methods and results shall be recorded. All ferrous welds shall be magnetic particle inspected for defects. All nonferrous welds shall be visually inspected, and if questionable defect are identified, a penetrating dye shall be used to further evaluate the quality of the weld. All bolts and pins shall be ultrasonically inspected for internal flaws. A waterway pressure test shall be performed and a hydraulic oil sample taken.

c). The following measurements shall be taken and recorded in the examination and test record: bearing clearance and backlash, elevation cylinder drift, engine speed operating rpm, relief pressure, stabilizer extension cylinder drift, ladder section twist, hardness readings, base rail thickness, winch drift, extension brake drift, and extension cylinder drift.

PERSONNEL

The inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

AERIAL APPARATUS CERTIFICATIONS

When the unit successfully meets all the requirements outlined in NFPA 1901, 2009 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit’s compliance with NFPA 1911.

MANUALS

The aerial manufacturer shall provide the following manuals pertaining to the aerial device:

• Two (2): Operators' manuals.
• Two (2): Parts manuals in a CD format.
• Two (2): Complete Electrical and Hydraulic Diagrams in a CD format.

SERVICE

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of downtime, the manufacturer of the aerial device shall maintain a network of service centers with factory-trained personnel.

The service facility shall carry an inventory of parts, separate from production parts.

WARNING DECALS

Warning decals shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions. All warning labels shall be in general compliance with A.N.S.I. Z534.1 recommendations.

ON-SITE PREVENTATIVE MAINTENANCE & OPERATIONAL TRAINING

PROGRAM OUTLINE
An on-site program for demonstration and instruction of the Fire Department personnel shall be provided. This program shall be designed to assure complete understanding of all aspects of the aerial device in the operating environment.

After the unit has been accepted, a factory trained, qualified Field Service Technician shall be provided for a minimum of three (3) consecutive days of instruction.

The program shall be designed to instruct an individual who has never utilized an aerial device of this type before. The individual shall be thoroughly taught the operating systems of the aerial device, including emergency operation. Introductory service skills utilizing the vehicle shall also be taught.

OPERATION & MAINTENANCE PROGRAM

To instruct Fire Department personnel in the operation, preventative maintenance and care of the aerial device, this instruction program shall be oriented towards a hands-on approach utilizing the new apparatus.

1. Explain operations of the entire aerial device. Each participant shall actually use the aerial and be instructed in the necessary steps of safe operation.
2. Troubleshooting shall be emphasized and reinforced continually throughout the instruction period.

3. Preventative maintenance procedures shall be setup and definite schedules developed to assure proper maintenance of the aerial device.
4. Instruction in the use of tools and how to replace minor assemblies, as applicable. Equally important in this instruction shall be when to call appropriate personnel for assistance.
5. How to order parts through the local service center by utilizing parts manual.

AERIAL APPARATUS CERTIFICATIONS (TYPE 1)

The aerial device shall be tested in compliance with the National Fire Protection Association's Standard #1911 (latest edition). Ongoing structural and physical property testing during construction will also be done.

The following tests shall be conducted by personnel holding a Level II certification to detect defects and improperly secured components:

1. Magnetic particle inspection shall be conducted on all ferrous welds to assure the integrity of the weldments and also detect any flaws or weaknesses. These tests shall be performed prior to paint or assembly.
2. Ultrasonic inspection shall be used to detect any flaws in pins, bolts and other critical mounting components. The bolts shall be tested after the have been torqued to ensure the bolt was not damaged.
3. All extension/retraction cables shall be tested and certified by the cable vendor.
4. All extension/retraction shall be tested and certified by the cable vendor.
5. Functional tests, load tests, stability tests and visual structural examination shall be performed. These tests will determine any unusual deflection, vibration, or instability characteristic of the unit.
6. Hydraulic oil shall be sample tested prior to delivery.
7. A waterway system pressure test shall be performed.

Upon completion of the preceding inspections, the independent testing company shall issue a Certificate of Inspection indicating that all specified standards have been satisfied. The Type I certification shall be provided by Underwriters Laboratories Inc. (UL). Aerial manufacturers not utilizing third party, independent testing companies shall not be acceptable.

TESTS

The following test shall be conducted to the aerial device prior to delivery; all listed tests shall be witnessed and certified by Underwriters Laboratories Inc. (UL) to ensure the device meets all current requirements of NFPA-1901.

The manufacturer of the aerial device shall to provide a written statement signed by a Registered Professional Engineer certifying the aerial's ability to perform the following tests:

1. 1-1/2:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the ladder sections are so designed and powered to support a load representing 150% of the manufacturer's rated tip load capacity at maximum horizontal reach on level ground. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 750 pounds at the ladder tip with the ladder fully extended at zero degrees shall be rotated 360 degrees.

2. 1-1/3:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the tip and ladder sections are so designed and powered to support a load representing 133% of the manufacturer's rated tip load capacity at maximum horizontal reach on a five (5) degree slope. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 666 pounds at the ladder tip with the ladder fully extended at zero degrees shall be rotated 360 degrees.
3. TIME TEST - A test of the apparatus shall be performed to raise the ladder from a bedded position extended to full height and rotated through a 90 degree turn smoothly and without undue vibration in not over 120 seconds.
4. WATER TOWER TEST #1 - A test of the apparatus shall be performed to test its ability to discharge 1000 gallons per minute parallel to the ladder with the unit at full extension and zero degree elevation. The unit shall be capable of performing this test with a rated tip load of 500 pounds at the ladder tip.
5. WATER TOWER TEST #2 - A test of the apparatus shall be performed to test the ability to discharge 1000 gallons per minute, 90 to the ladder with the ladder at full extension, zero degree elevation. The unit shall be capable of performing this test with a rated tip load of 500 pounds at the ladder tip.
6. HORIZONTAL LOAD TEST-With the aerial device out of the cradle at zero degree elevation, a horizontal load of 500 lbs. shall be applied to the tip of the ladder.

Vendors must state their ability to comply with all of the above tests. Failure to do so shall be grounds for rejection of their proposal.

WARRANTY - AERIAL DEVICE

The aerial device manufacturer shall guarantee to the original purchaser to repair or replace any defective structural component resulting from faulty material or workmanship for a period of twenty (20) years after delivery of the aerial device to the purchaser. The warranty shall cover the aerial ladder weldments, open base, torque box and outrigger weldments.

To ensure sole source responsibility of the aerial device, the vendor shall clearly state its intention to warrant the aerial ladder, open base, torque box and outrigger weldments as these integral parts and components of the aerial device.

WARRANTY - AERIAL DEVICE COMPONENTS

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from faulty material or workmanship, for a period of two (2) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDERS

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from faulty material or workmanship, for a period of two (2) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDER STRUCTURAL

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from structural defects or failures, for a period of five (5) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDER SEALS

The manufacturer of the aerial device shall also guarantee the cylinder seals to be free from Type III leakage for a period of two and one half (2-1/2) years after delivery of the aerial device to the purchaser.

WARRANTY - TELESCOPIC WATERWAY ASSEMBLY

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed Telescopic Waterway Assembly, resulting from structural defects or failures, for a period of ten (10) years after delivery of the aerial device to the purchaser.

REFLECTIVE STRIPING AND NUMBERING

The reflective striping and numbering shall be supplied and installed by the dealer prior to delivery.
Shall match most recently delivered HFD apparatus.

RETROREFLECTIVE CHEVRON STRIPING

There shall be diamond grade retro reflective chevron striping applied prior to applying the accessories on the rear of the apparatus. The retro reflective chevron striping shall be red and yellow in color.

LICENSE PLATE MOUNTING

A Cast Products, model LP0004-1-B, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate a clear LED light (WL0501) to illuminate the license plate and meet DOT requirements.

GROUND LADDERS

Two (2) Alco-Lite 28' two (2) section aluminum extension ladder(s) model PEL-28.
One (1) Alco-Lite 35' two (2) section aluminum extension ladder(s), model PEL-35.
Three (3) Alco-Lite 16' aluminum roof ladder(s) with folding hooks, model PRL-16.
One (1) Alco-Lite 50’ three (3) section aluminum extension ladder, model TEL3-50P.
Two (2) Alco-Lite 10' aluminum attic ladder(s), model FL-10.
One (1) Alco-Lite 12' aluminum attic ladder(s) model FL-12.
One (1) Little Giant model 17 type 1A 6005-T5 aluminum ladder with patented triple-locking hinges, and 300lb capacity provided with the apparatus.
Two (2) sets of NFPA compliant Ziamatic folding wheel chocks model # SAC-44-E shall be supplied with the apparatus.

Two (2) sets of Ziamatic folding wheel chock underbody horizontal mounts model #SQCH-44H shall be installed on the apparatus under the body below the L3 and R3 compartments.

SUPPLIED/INSTALLED EQUIPMENT

To be determined at Preconstruction Conference.

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # B-3

CITY OF HOUSTON FIRE DEPARTMENT

AERIAL TOWER SPECIFICATION

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) SOLICITATION NO.: S58-T25507
AERIAL TOWER SPECIFICATION - ATTACHMENT # B-3

CITY OF HOUSTON FIRE DEPARTMENT
AERIAL TOWER SPECIFICATIONS

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter and as specified with a view of obtaining the best results and the most acceptable apparatus for service in the Department. These specifications shall cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful vendor must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction for all features. Apparatus proposed by the vendor shall meet the requirements of the National Fire Protection Association (NFPA) as stated in current Pamphlet 1901 for Aerial Ladder & Elevated Platform Fire Apparatus, chapters 1, 2, 6, 8, 9, 10, 11, 16, and 23, except where amended herein. Loose equipment shall be provided only as stated in the following pages.

Quotes shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of twenty-five years.

Each vendor shall provide satisfactory evidence of their ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. They shall also show that they are in a position to render prompt service and to furnish replacements parts on said apparatus.

Because of the severe service requirements the department will impose on this apparatus, each vendor shall provide a list of at least six (6) departments serving populations of over 250,000 in which similar apparatus utilizing the brand of chassis proposed have been in service for over one year. This list shall include contact names and phone numbers.

Each quote shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus being furnished under contract shall conform. Computer runoff sheets are not acceptable as Contractor's Specifications. These specifications shall indicate size, type, model and make of all component parts and equipment.

Note: Each vendor shall submit their proposal in the same sequence as these specifications, to allow the department to easily compare multiple proposals.

DELIVERY

To insure proper break-in of all components while still under warranty, the apparatus shall be delivered under its own power, rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and instruct the Fire Department personnel in the proper operation, care and maintenance of the equipment delivered.

LIABILITY

The vendor, if their proposal is accepted, shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all proposals as it deemed in their best interests.

QUALITY AND WORKMANSHIP

The design of the Apparatus shall embody the latest approved automotive engineering practices. The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points:

Accessibility of the various units, which require periodic maintenance; and ease of operation (including both pumping and driving); and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off road requirements and to speed conditions as set forth under Performance tests and requirements. Welding shall be employed in the assembly of the apparatus in a manner that will not prevent the ready removal of any component part for service or repair.

All steel welding shall follow (American Welding Society) requirements for AWS D1.6:1999 Structural Welding Code for welding stainless steel structural assemblies. All aluminum welding shall follow (American Welding Society) requirements for AWS D1.2/D1.2M:2003 Structural Welding Code for any type structure made from aluminum structural alloys. All sheet metal welding shall follow (American Welding Society) AWS D9.1M/D9.1:2006 Structural Welding code for Arc/Braze requirements of non-structural materials. All pressure pipe welding shall follow (American Society of Mechanical Engineers) ASME IX/ ASME B31:2010 requirements to the qualification of procedures in welding and brazing, in accordance with the ASME Boiler and Pressure Vessel Code and the ASME B31 Code for Pressure Piping. Flux core arc welding to use alloy rods, type 7000, (American Welding Society) AWS standards A5.20-E70T1. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during testing operations within working hours to monitor weld quality.

Employees classified as welders shall be tested and certified to meet American Welding Society and American Society of Mechanical Engineers welding codes.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded to its estimated in-service weight and shall be capable of the following performance while on dry paved roads that are in good condition and for a continuous run of ten (10) miles or more, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful vendor shall provide a Weight Certificate showing weights on front axle, rear axles and total weight for the completed apparatus at time of delivery.

The apparatus shall be capable of accelerating to 35 MPH (55 km/hr) from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.

A. The apparatus shall be capable of accelerating to 35 MPH (55 km/hr) from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.

B. The apparatus, fully loaded, shall be capable of obtaining a minimum top speed of 50 MPH (80 km/hr) on a level dry concrete highway with the engine not exceeding its governed RPM (fully

loaded).

C. The service brakes shall be capable of stopping a fully loaded vehicle in 35ft (10.7 m) at 20 mph (32.2 km/hr) on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

D. The apparatus, when fully loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.

If optioned, the apparatus shall be tested and approved by the Underwriter's Laboratories Incorporated in accordance with their standard practices for pumping engines. The contractor shall provide copies of the Pump Manufacturer's Certification of hydrostatic test, the Engine Manufacturer current certified brake horsepower curve, and the Manufacturer's record of pumper construction details when delivered. If optioned, the vendor, at their expense, shall have the Underwriter's Laboratories Incorporated conduct the tests required by the Underwriter Laboratories Incorporated (Guide for the Certification of Fire Department Pumper subject 822 dated 1995 or latest). A copy of all tests shall accompany the Apparatus. (For apparatus sold within Canadian ULC S515 / latest revision.)

INFORMATION REQUIRED

The manufacturer shall supply at time of delivery, a complete operation and maintenance manual covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment to specify the quantity and type of the following fluids used in the vehicle: Engine oil, engine coolant, and chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used) and drive axle lubrication fluid as well as the standard fluids listed per manufacturer.

The manufacturer shall supply the final certification of GVWR and GAWR (in lbs.) on a nameplate affixed to the vehicle.

A permanent plate in the driver's compartment shall be installed, specifying the seating capacity of the enclosed cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" shall be provided and will be visible from each seated position. An accident prevention sign shall be located at the rear step area of the apparatus. It shall warn all personnel that standing on the step while apparatus is in motion shall be prohibited.

The above listed plates mounting location TBD by Fire Dept at final inspection.

LIABILITY

The vendor, if their quote is accepted, shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

SPECIFICATION REQUIREMENTS

Item compliance shall be indicated in the “Yes/No” column of each item by all vendors. Vendors shall submit a detailed proposal. Each vendor shall submit their proposals in the same arrangement as these specifications for ease of evaluation, comparison, and examination of compliance. Quote

communications by letter only and/or written on a company letterhead, shall not be acceptable.

EXCEPTIONS TO SPECIFICATIONS

The following specifications shall be strictly adhered to*. Exceptions shall be allowed if they are equal to or superior to that as specified and providing they are listed and entirely explained on a separate page entitled "Exceptions to Specifications". The exceptions list shall refer to specification page number and paragraph.*

Proposals taking total exception to specifications or total exception to certain parts of the specifications will not be acceptable. The Apparatus shall be inspected upon completion for compliance with specifications. Deviations will not be tolerated and will be cause for rejection of Apparatus unless they were originally listed in vendor's proposal and accepted in writing by the department.

If the vendor takes an exception, on the exception page, the vendor must state an option price to bring their specifications into full compliance with the Department specifications. Failure to provide this information shall be cause to reject the proposal as being non-responsive. An exception to these requirements shall not be tolerated.

PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all quotes as it deemed in their best interests.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Agency.

The apparatus shall be designed so that the operator could perform all recommended daily maintenance checks easily without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These components must not be welded or otherwise permanently secured into place.

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, the specified hose load, unequipped personnel weight, ground ladders and a miscellaneous equipment allowance per NFPA criteria. It shall be the responsibility of the purchaser to provide the contractor with the weight of equipment to be carried if it is in excess of the allowance as set forth by NFPA.

The unequipped personnel weight shall be calculated at 250 lbs. per person times the maximum number of persons to ride on the apparatus. The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and

equipped shall not exceed 7 percent.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Where special tools manufactured or designed by the contractor and are required to provide routine service on any component of the apparatus built or supplied by the contractor, such tools shall be provided with the apparatus.

PROPOSAL DRAWINGS

For purposes of evaluation, the vendor shall provide a drawing illustrating, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus and other specified equipment, shall be required to be included with the vendor's proposal package.

The drawings shall be large "D" size (minimum 24" x 36"). Smaller size drawings, "similar to" drawings or general sales drawings, shall not be acceptable. Failure to provide a quote evaluation drawing in accordance with these specifications shall be cause for rejection of the proposal.

APPROVAL/PRE-CON DRAWINGS

After the award of the purchase, the contractor shall provide detailed colored engineering drawings including, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus for use of pre-construction conference. The drawings shall include, but shall not be limited to the right, left, top, front and rear views of the apparatus. The Customer will sign the final approval drawing.

One (1) electronic copy (PDF) and four (4) printed "D" size drawings will be provided.

SINGLE SOURCE MANUFACTURER

Quotes shall only be accepted from a single source apparatus manufacturer.

The definition of single source manufacturer is company that designs and manufactures their products utilizing an approach that includes complete product integration, including the apparatus chassis, cab, and body modules being constructed, assembled, and tested on company premises only.

Warranties qualified to the chassis and body design construction (excluding vender component warranties such as engine, axles, transmission, and pumps, etc.) will be from a single source manufacturer and not separated between manufacturers (i.e. body and chassis). The vendor shall provide evidence of maintaining compliance to this requirement.

SUPPLIED INFORMATION & EXTRAS

The apparatus manufacturer shall supply two (2) copies of apparatus manuals (one printed and one on CD) with all manufactured apparatus. The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacturer can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, the manufacturer shall also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other

recommendations for care and upkeep of the general apparatus.

The manufacturer shall also supply a manufacturer's record of apparatus construction details, including the following information:

Owner name and address:

Apparatus manufacturer, model, and serial number:

Chassis make, model, and serial number:

GAWR of front and rear axles:

Front tire size and total rated capacity in pounds:

Rear tire size and total rated capacity in pounds:

Chassis weight distribution in pounds with water (if applicable) and manufacturer mounted equipment (front and rear):

Engine make, model, serial number, rated horsepower, related speed and no load governed speed:

Type of fuel and fuel tank capacity:

Electrical system voltage and alternator output in amps:

Battery make and model, capacity in CCA:

Paint numbers:

Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full (if applicable) but without personnel, equipment, and hose):

Written load analysis and results of the electrical system performance tests:

Transmission make, model, and type:

Pump to drive through the transmission (yes or no):

Engine to pump gear ratio and transmission gear ratio used:

Pump make, model, rated capacity in gallons per minute, serial number, and number of stages:

Pump manufacturer's certification of suction capability:

Pump manufacturer's certification of hydrostatic test:

Pump manufacturer's certification of inspection and test for the fire pump:

Copy of the apparatus manufacturer's approval for stationary pumping applications:

Pump transmission make, model and serial number:

Priming device type:

Type of pump pressure control system:

The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed:

Certification of water tank capacity:

The certification of inspection and test for the aerial device:

All the technical information required for inspections to comply with NFPA 1914, Standard for Testing Fire Department Aerial Devices:

COLOR CODED ELECTRICAL SCHEMATICS

The apparatus manufacturer shall supply one (1) set(s) as-built wiring schematics, to include all line voltage schematics with each apparatus. Two (2) printed and one (1) CD.

GENERAL WARRANTY

A warranty shall be offered for each new fire apparatus manufactured for a period of Two (2) years from the date of delivery, except for the commercial chassis and certain other components as noted in the next paragraph.

In the case of a commercial chassis being used, the warranty on the chassis, engine, transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities.

STRUCTURAL WARRANTY

A structural Aluminum warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

PAINT WARRANTY

A ten (10) year Prorated Paint Warranty shall be included with the apparatus.

MULTI-PLEXED ELECTRICAL WARRANTY

If equipped, a four (4) year limited multiplex system warranty, shall be provided by the apparatus manufacture for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation.

APPARATUS TEST BY UNDERWRITERS LABORATORIES

The following Apparatus shall comply with all NFPA 1901 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by the contractor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall furnish the completed Test Certificate(s) to the purchaser at time of delivery.

Since the inspection services of Underwriters Laboratories are available to all vendors on an equal basis, no other third party testing service shall be acceptable.

The tests conducted on the apparatus shall include, but not be limited to:

12-VOLT ELECTRICAL TEST
The apparatus low voltage electrical system shall be tested and certified.

The Fire Department will be notified three weeks prior to testing so, if desired, they can send someone to attend the testing.

FACTORY PRECONSTRUCTION CONFERENCE

The factory authorized Distributor shall be required, prior to manufacturing, to have a preconstruction conference at the manufacturing facility with a factory representative present and four (4) individuals from the Fire Department to finalize all construction details.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

MID INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a aerial/pre-paint inspection conference at the site of the manufacturing facility with at least 4 individuals from the Fire Department to inspect the apparatus during construction. The "Purchaser" shall designate the stage of construction at which the visit will be conducted.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

FINAL INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a final completion inspection conference at the site of the manufacturing facility with four (4) individuals from the Fire Department to inspect the apparatus after construction.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

ON-LINE CUSTOMER INTERACTION

The manufacture shall provide the capability for online access through the manufacture's website. The customer shall be able to view digital photos of their apparatus in the specified phases of construction. The following phases will be captured and displayed on the manufacture's website:

1. Chassis (Front,Sides,Rear)
2. Body – Prior to Paint - (Front,Sides,Rear)
3. Body – Painted - (Front,Sides,Rear)
4. Pump and Plumbing
5. Assembly – 80% Complete - (Front,Sides,Rear,Top)

Due to the complex nature of fire apparatus and the importance of communication between the manufacture and customer, this line item is considered a critical requirement.

MAXIMUM OVERALL LENGTH REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum overall length.

MAXIMUM OVERALL HEIGHT REQUIREMENT

The apparatus specified shall be constructed as detailed and shall NOT exceed a maximum overall height of 12' 3".

MAXIMUM OVERALL WIDTH

The apparatus specified shall be constructed as detailed and shall NOT exceed a Maximum Overall Width of One Hundred (100") inches, nor be less than Ninety-Six (96") inches.

This dimension shall include the primary construction of the apparatus body and chassis cab. Any peripherals that are 'removable' shall not be incorporated into this measurement.

Items that are considered 'removable' are: Rub Rails, Fenderettes, Mirrors, Lights, Handrails, Front Bumpers, Etc.

MAXIMUM WHEEL BASE REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum wheel base.

MODEL

The chassis shall be the manufacturer's Premium Custom Extended Medium/Long Four-Door Cab model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2015/2016 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. Manufacturer is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from manufacturer or their OEM needed to be in compliance with those regulations.

APPARATUS TYPE

The apparatus shall be an aerial vehicle designed for emergency service use. The apparatus shall be equipped with a ladder, elevating platform or water tower that shall be rear mounted thus providing the following vehicle benefit.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.
The front gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer. This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

The rear gross axle weight rating (GAWR) of the chassis shall be determined by the OEM engineer. This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

CAB STYLE

The cab shall be a custom, fully enclosed, Extended Medium/Long Four Door model with a 10.00 inch raised roof, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint

repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 (min 0.13 - 0.19 inch) thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be (min 0.13 inch) thick; the rear wall and raised roof skins shall be (min 0.09 inch) thick; the front cab structure shall be (min 0.19 inch) thick.

The exterior width of the cab shall be at least 96.00 inches, but not greater than 100.00 inches wide with a minimum interior width of 90.00 inches. The overall cab length shall be a minimum of 136.00 inches with min of 60.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab unless unattainable.

The cab shall offer an interior height of min of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 60.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab a min of 55.00 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of a min of 40.00 inches wide X 53.00 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of a min of 32.00 inches wide X 51.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches for the driver and officer.

The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches for the crew members.

OCCUPANT PROTECTION

The vehicle shall include a passenger safety system which shall secure belted occupants and increase the survivable space within the cab. The system shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the system shall also provide ejection mitigation protection.

The system components shall include at a min:

- Driver steering wheel airbag
- Officer knee airbag (if available)
- Large driver, officer, and crew area side curtain airbags
- Driver knee bag (if available)
- Seat belt safety system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck control module (CM) - receives inputs from the outboard sensors, selectively deploys safety systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the CM
- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the CM. In a qualifying front impact event the outboard sensors provide inputs to the CM. The CM activates the steering wheel airbag, officer side knee airbag, and advanced seat belts for each occupant in the cab.

The frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95th percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the CM. In qualifying rollover or side impact events the outboard sensors provide inputs to the CM. The CM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The CM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the CM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, aluminum plate which shall be an integral part of the cab.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of the lamps.

FRONT GRILLE

The front cab fascia shall include a box style grille with deviations approved by the HFD. The grille shall include a minimum free air intake that meets the minimum requirements of the engine manufacturer. If available, the grille will include a unit designation, i.e., “83”.

CAB UNDERCOAT

There shall be a protective undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper, the seams shall be sealed with a high quality brand seam sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The cab shall then be painted with the specific color designated by the customer with a minimum thickness of 2.00 mils of paint, followed by a clear top coat not to exceed 2.00 mils. Any process which provides the entire cab to be baked/heated to speed the curing process of the coatings will be allowed.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT COLOR

The primary/lower paint color shall be PPG FBCH 926236 red or alternative approved by the HFD.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner’s date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a red non or low gloss spray on bed liner product which shall mold to each surface of the cab interior. The dash area shall be non gloss (flat). The liner shall be environmentally friendly and chemically resistant and non abrasive. Color to be approved by Fire Dept.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a min thickness of 0.13 inch. The exterior skins shall be constructed of min 0.13 inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style and shall be constructed of stainless steel.

CAB ENTRY DOOR TYPE

All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately a min 32.00 inches of clearance from the ground to the bottom of the door so cab doors may be opened un-hindered by most obstacles encountered, such as guard rails along interstate highways.

CAB INSULATION

The cab ceiling and walls shall include approx. 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH EXTERIOR MID EMS COMPARTMENT

The cab shall include an interior clear area provision for the side curtain crew airbag mounting to account for a compartment located in the middle of the wall to be installed by the body builder. The clear area shall extend from the cab ‘B’ pillar to the standard rear door location above the left side wheel well. The provision allows appropriate airbag selection for clear airbag deployment and adequate protection and ejection mitigation.

CAB ROOF TRENCH

The center section of the 10.00 inch raised roof shall include an approx 10.00 inch deep trench to accommodate the aerial device.

CAB STRUCTURAL WARRANTY

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon or equivalent brand of multiplexing system, suppressed per SAE J551. The 12V system breaker and relay panel shall be located as close to the windshield as possible. The wiring shall be appropriate gauge cross link with a high degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a display which shall be located on the left side of the dash in the switch panel. The display shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received.The display screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

AUXILIARY ACCESSORY POWER

An auxiliary six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed behind the switch panel. The fuse panel shall be protected by a 100 amp fuse. The panel shall be capable of carrying up to a maximum 100 amp battery direct load.

ADDITIONAL ACCESSORY POWER

An additional six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed on the side wall of the engine tunnel (drivers side). The fuse panel shall be protected by a 100 amp fuse. The panel shall be capable of carrying up to a maximum 100 amp battery direct load.

EXTRA ACCESSORY POWER

An extra six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be provided and temporarily secured on the floor at the center of the rear wall of the cab with four (3) feet of additional wiring. Permanent location TBD by Fire Dept at Final inspection.The fuse panel shall be protected by a 60 amp fuse. The panel shall be capable of carrying up to a maximum 60 amp battery direct load.

ANCILLARY ACCESSORY POWER

One (1) ancillary six (6) position Blue Sea Systems 5025 blade type or equivalent fuse panel shall be installed behind the officer's seat or officer's side wall of engine tunnel. The fuse panel shall be protected by a 100 amp fuse located at the batteries. The fuse panel shall be capable of carrying up to a maximum 100 amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

DATA RECORDING SYSTEM

The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ENGINE

The chassis engine shall be a Cummins ISX15 engine. The ISX15 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 550 horse power at 1800 RPM and shall be governed at 2000 RPM. The torque rating shall feature 1850 foot pounds of torque

at 1200 RPM with 912 cubic inches (14.9 liter) of displacement. The ISX15 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2010 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication. A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of approx. 0.19 of an inch thick aluminum alloy plate. The tunnel dimensions shall be approved by the Fire Dept.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit. The controls shall be in a accessible area.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at a min of 1200 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the display/control screen for the high idle speed control.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

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

AUXILIARY ENGINE BRAKE

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle’s brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

AUXILIARY ENGINE BRAKE CONTROL

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

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

The compression brake shall be controlled via an (off/low/medium/high) button/switch through the display/dash. Fire Dept must approve location. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The engine oil, coolant, transmission, power steering fluid, windshield wiper fluid fills shall be located under the cab and easily accessible.

ENGINE DRAIN PLUG

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

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed between 600-700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall be direct drive belt driven on the engine.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer's requirements.

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris.

ENGINE COOLANT

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

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light and an audible tone alarm shall also be provided to warn of a low coolant incident.

COOLANT HOSES

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE AIR INTAKE AND RESTRICTION W/REPLACEABLE ELEMENT

The engine air intake system shall include an ember separator air intake filter which shall be located per the chassis design. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

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

The air flow distribution and dust loading shall be uniform throughout the high-performance filter cone pack, which shall result in pressure differential for improved horsepower and fuel economy. The air intake shall be mounted within easy access. The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize a min. of 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall be mounted below the frame in the inboard position with the SCR canister in line rearward of the DPF.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a min. capacity of six (6) usable gallons. Mounting location to be approved by Fire Department.

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

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

ENGINE EXHAUST ACCESSORIES

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

ENGINE EXHAUST WRAP

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

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.
The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
Rev	4.80:1

TRANSMISSION MODE PROGRAMMING

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

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall provide a prognostic indicator (wrench symbol) on the digital display between the selected and attained indicators. The prognostics monitor various operating parameters to determine and shall alert you when a specific maintenance function is required. The pad will be illuminated for night time operations.

TRANSMISSION COOLING SYSTEM

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

TRANSMISSION DRAIN PLUG

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

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen IV-E EVS group package number 127 shall contain the 199 vocational package in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

An eight (8) pin Delphi connector will be provided next to the steering column connector. This will contain the following input/output circuits to the transmission control module. The Gen IV-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	Description	Wire assignment
C	PTO Request	143
F	Aux. Function Range Inhibit (Special)	101/142
G	PTO Enable Output (See Input Function C)	130
S	Neutral Indicator for PTO	145
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION RETARDER CONTROL

The Allison transmission retarder control shall be 100% modulated by brake pedal actuation and shall include a enabled/disabled switch on the display or dash. The activation of the retarder shall activate the brake lights and shall be inactive during pump mode.

TRANSMISSION RETARDER CAPACITY LEVEL

The transmission retarder shall be programmed so the maximum retardation shall be at the high capacity level.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

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

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

LH PTO

A ten (10) bolt heavy duty clutched drive PTO shall be installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

LH PTO MODEL

A ten (10) bolt heavy duty transmission driven PTO shall be installed. The clutched shifted PTO should be designed specifically for the Allison world transmission and provide torque ranges from 250 to 335 lb. ft.

RH PTO

A (10) bolt heavy duty clutched drive PTO shall be installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

RH PTO MODEL

A ten (10) bolt heavy duty transmission driven PTO shall be installed. The clutched shifted PTO should be designed specifically for the Allison world transmission and provide torque ranges from 250 to 335 lb. ft.

PTO LOCATIONS

The dual transmission driven power take offs (PTO) shall be mounted in locations approved by the Fire Dept.

PTO PROGRAMMING

The power take off shall be programmed for operator control such that it shall only engage at or below 900 RPM and operate in a range up to 4000 RPM. The PTO programming shall provide for automatic

disengagement set at a specified engine speed of 4000 RPM which shall protect equipment driven from the power take off.

PTO CONTROL

The left hand aerial power take off shall be controlled by the transmission. It will be activated by a button/switch on the display/dash. Disable is displayed when switch is off. Enable is displayed when the switch is turned on. Active is displayed when the switch is on with positive engagement of the power take off.

Required operating conditions for enabling this function are:

- Throttle position is low
- Engine speed is within customer modifiable constant limits
- Output speed is within customer modifiable constant limits
- Park brake set
- Transmission in (N)

PTO CLEARANCE

If required the cab floor shall include an addition into the cab interior to provide additional clearance for a power take off on the transmission. The pocket shall be constructed of 0.19 inch thick bright embossed aluminum tread plate and a low profile dimension.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat® or Glide Coat equivalent.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and a see through cover to allow visual inspection of fuel and filter condition. The filter/seperator shall be a 10 micron filter capable of handling a maximum flow rate of 150 gallons per hour.

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

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL COOLER

Aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

FUEL TANK

The fuel tank shall have a capacity of a minimum of sixty (60) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw. The vent shall include a three (3) feet long vent hose to allow for the vent to be mounted so the end of the vent line is at least forty (40) inches from the ground. The final routing of the vent hose shall be determined by the OEM.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A min.0.50 inch NPT drain plug shall be centered in the bottom of the tank.
The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the rearward position and the right fill port located in the rearward position of the fuel tank.

A 1.50 inch diameter hole shall be provided in the left and right frame rails for vent hose routing provisions. The holes shall be located adjacent to the fuel tank.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL FILL LOCATIONS

Fuel fill locations will be located on the right and left sides of the body for easy fueling at a retail fuel facility. Locations to be approved by the Fire Dept.

FRONT AXLE

The front axle shall include an independent front suspension (IFS) offering superior ride and improved handling.

The suspension shall utilize fully independent double wishbone arms with carrier and kingpin for optimized scrub radius. Air springs are tuned for ride and help reduce suspension weight. The IFS reduces turn radius with improved wheel cut over beam axles. The hydraulic damper shall feature rebound control to ensure the maximum load stability and superior driver comfort. The IFS system shall improve handling and offer better braking because of improved ground to tire ratio. This design shall allow for independent adjustment of the vehicle's alignment settings. The IFS shall include an auxiliary transverse leaf spring.

Proposals offering independent front axles comprised of torsion bar style suspensions shall not be considered.

FRONT AXLE WARRANTY

The front axle shall be warranted by manufacturer for a minimum of three (3) years or 150,000 miles, whichever comes first.

FRONT WHEEL BEARING LUBRICATION

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

FRONT SHOCK ABSORBERS

Two (2) KONI or equal, inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The KONI front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the shock absorbers.

Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.

FRONT SUSPENSION

The independent front suspension (IFS) system shall improve handling and offer better braking because of improved ground to tire ratio. Lower spring rates and independent wheel travel shall reduce the shock within the wheel and feedback throughout the axle. Increased roll stiffness reduces chassis lean in cornering. The suspension travel of the IFS shall be a minimum 6.50 inches, providing 3.00 inches jounce and 3.50 inches rebound of the suspension. This feature shall offer a smoother ride for personnel and sensitive equipment. The IFS front axle shall be rated between 21,000 and 24,000 pounds.

Alternative IFS systems can be considered by the HFD.

STEERING COLUMN/ WHEEL

The cab shall include a steering column which shall include a multi-position tilt, a minimum 2 inch telescopic adjustment, and a minimum 18.00 inch steering wheel located at the driver’s position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch and any other functions installed per manufacturer.

POWER STEERING PUMP

The hydraulic power steering pump shall be a Vickers 20V and shall be gear driven from the engine. The pump shall be a fixed displacement vane type. The power steering fluid shall be synthetic ATF and have a pour point of -67 degrees Fahrenheit (-55ºC). Alternative models to be approved by Fire Dept.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

FRONT AXLE CRAMP ANGLE

The chassis shall have a maximum front axle cramp angle of 55-degrees to the left and right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85/RCS 85. Alternative models to be approved by Fire Dept.

CHASSIS ALIGNMENT

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

REAR AXLE

The rear axle shall be a Meritor model RT-185 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity that will meet the needs of the apparatus.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of a minimum 0.50 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for a minimum of two (2) years with unlimited miles under the general service application.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock which shall allow both axles to be engaged as drive axles. The inter-axle differential lock shall be controlled by a button/switch on the display/dash. The display/switch shall indicate when positive engagement of the inter-axle differential lock has occurred.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 60 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The tandem rear axle shall feature a Ridewell Dynalastic or equivalent model, with accordion style elastomer springs. The suspension shall incorporate a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement. The rear tandem suspension shall have 54.00 inch axle centers. Alternative models to be approved by the Fire Dept.

The rear tandem suspension rated capacity shall meet the needs of the apparatus.

REAR SHOCK ABSORBERS

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

SUSPENSION CONTROLS

The front suspension shall incorporate an air retention system which shall activate when the aerial power take off is activated. The air retention system shall retain air in the front suspension air bags when the chassis is raised off the ground by the aerial outriggers. There shall be an indicator light on the driver's panel to indicate low pressure in the air retention system. These controls are contingent upon only if needed per manufacturer.

FRONT TIRE

The front tires shall be Goodyear 445/65R-22.5 20PR "L" tubeless radial G296 MSA mixed service tread.

The front tire stamped load capacity shall be 24,600 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating load capacity shall be 26,320 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch. The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

The rear tires shall be Goodyear 315/80R-22.5 20PR "L" tubeless radial G291 highway tread.

The rear tire stamped load capacity shall be 33,080 pounds per axle with a speed rating of 68 miles per hour when properly inflated to 130 pounds per square inch.

Alternative models to be approved by Fire Dept.

The Goodyear Intermittent Service Rating load capacity shall be 33,080 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch. The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.38:1.

TIRE PRESSURE INDICATOR

There shall be a voucher provided with the chassis for a dial style tire pressure indicator at the front and rear tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 13.00 inch LvL One™ polished aluminum wheels with Dura Bright finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and a polished finish that lasts.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, heavy duty, 22.50 inch X 9.00 inch aluminum wheels with Dura Bright finish. Each wheel shall have a polished aluminum finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BALANCE WHEELS AND TIRES

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be Real Wheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification. Alternative models to approved by Fire Dept.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a minimum 6000 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

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

A six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

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

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

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

FRONT BRAKES

The front brakes shall be Knorr/Bremse SN7 disc brakes with 17.00 inch vented rotors.
Alternative models to be approved by the Fire Dept.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe. Alternative models to be approved by the Fire Dept. Dust shields will be provided.

PARK BRAKE

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

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

PARK BRAKE CONTROL

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

The parking brake actuation valve shall be mounted in a Fire Dept approved location. A guard shall be installed over the parking brake control to prevent accidental application or release.

REAR BRAKE SLACK ADJUSTERS

Gunite rear brake automatic slack adjusters shall be installed on the axle.

AIR DRYER

The brake system shall include a Bendix AD-9 fully self contained air dryer which shall not require an extra purge tank or additional valves. The AD-9 system shall include a spin-off desiccant filter with a 12-volt, 75-watt thermostatically controlled heating element. The air dryer shall feature a premium, high crush strength desiccant which shall be produced with a composition that shall be more effective and longer lasting than other desiccants. It shall also offer protection against contamination and desiccant breakdown. The air dryer shall be mounted in an easily accessible area.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the independent front suspension axle.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

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

AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a minimum 2000 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Manual cable actuated drain valves shall be installed on all reservoirs of the air supply system. The actuation pull cables shall be coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with black textile braid covered high tensile steel reinforced wire braided hose with steel reusable fittings. All drop hoses shall be fiber reinforced neoprene covered hose.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE

The chassis wheelbase shall be no longer than. 251.50 inches.

The chassis rear overhang shall be no longer than 135.50 inches.

FRAME

The frame shall consist of double side rails and cross members forming a ladder style frame. The side rails shall be formed in the shape of a "C" channel, with the outer rail measuring a min. of 10 inches high X 3.50 inches deep X 0.38 inches thick, with an inner channel a minimum of 9 inches high X 3 inches deep X 0.38 inches thick. Each rail shall be constructed of a minimum of 110,000 psi minimum yield high strength low alloy steel. The double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,900,000 inch pounds and have a section modulus no less than of 18.00 cubic inches. Any frame reinforcements to be provided at manufactures expense.

Proposals calculating the frame strength using the “box method” shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of five (5) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using protective coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

FRAME PAINT

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. Manufacturer recognized standards shall be used for adhesion, hardness, impact resistance of the applied coatings.

Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above. The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.

REAR MUD FLAP

The unit shall be equipped with a temporary wooden fender and mud flap assembly for transport to the body manufacturer, if required.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel. It shall measure a minimum of 10.50 inches high with a minimum 3.0 inch flange and shall have angled front corners.

Side bumper pockets will be recessed into the sides of the bumper to accommodate the placement of the Intersection Warning lights. (Whelen M6 series)

The front bumper shall be extended approximately 21.00 inches ahead of the cab. The front bumper shall be painted the same as the lower cab color. The extension shall be mounted using Grade 8 bolts.

The 21.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate. The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a

distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep.

The siren shall be pedestal mounted on the bumper apron on the furthest outboard section of the bumper on the driver side. Fire Dept to approve location.

AIR HORN

The chassis shall include two (2) Grover brand Stutter Tone air horns which shall measure 24 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish.

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

One (1) air reservoir, with a minimum 2000 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

The bumper shall include two (2) Whelen Engineering Inc. model SA314A, 100 watt speakers which shall be recess mounted within the bumper fascia. Each speaker shall have a natural cast aluminum finish and shall be installed using a polished aluminum trim ring.

The two (2) electronic siren speakers shall be located on the front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty chrome plated tow hooks shall be installed below the front bumper, forward position and bolted directly to the outside of each chassis frame rail with grade 8 bolts.

FRONT LICENSE PROVISION

The bumper shall include four (4) mounting holes to allow for a license plate to be installed by the OEM or end user. The mounting holes shall be drilled and tapped for ¼-20 threaded bolts.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located in an accessible area.

The electric-over-hydraulic lift system shall include an ignition interlock and illuminated lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port.

A yellow steel safety channel assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the rear surface of the right hand side battery box. The pump shall be plumbed with 25.00 feet of additional length in the hoses so that the pump can be relocated by the apparatus manufacturer.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB TILT LOCK DOWN INDICATOR

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

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

CAB WINDSHIELD

The cab windshield shall have a minimum surface area of 2900 square inches and be of a one (1) or two (2) piece wraparound design for maximum visibility. Single piece designs can be considered.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective door panel. The switches will not be placed in an area where accidental activation will occur on a frequent basis. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window. The window shall be a powered type and shall be controlled by a switch on the door panel and on the driver's control panel. The switches will not be placed in an area where accidental activation will occur on a frequent basis

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR LH

The rear left hand side crew door shall include a window. The window shall be a powered type and shall be controlled by a switch on the door panel panel and on the driver's control panel. The switches will not be placed in an area where accidental activation will occur on a frequent basis

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

The cab shall include a 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. The temperature and blower controls shall be located on the heater/air conditioning unit.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-quip EZ clip fittings.

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating and defrosting controls shall be located in an accessible area. The heating and air conditioning controls shall be located in an accessible area.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed on the left side of the cab, mid-roof. Exact location TBD by Fire Dept.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

CAB CIRCULATION FANS

The cab shall include two (2) all metal 6.00 inch air circulation fans installed in the front area of cab and location to be approved by Fire Dept. Each fan shall be controlled by an individual toggle switch on each fan. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

The cab shall be provided with two (2) individually switched all metal construction 6.00 inch fans. The fans shall be installed in the crew area just behind the front doors approximately 9.00 inches inboard and location to be approved by Fire Dept. The multi-purpose fans can be used for air circulation or to help defog windows.

CAB INSULATION

The cab ceiling and walls shall include minimum 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall be a minimum 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil

facing, reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall be a minimum 0.50 inch thick including a 1.0#/sf PVC barrier and moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab and the insulation inside the tunnel shall have a removable aluminum overlay installed to protect the insulation and assist in retaining the insulation tight against the engine tunnel surfaces.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of a minimum 0.25 inch thick sound absorbing closed cell foam with a minimum 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and embossed tread plate that shall wrap 2” horizontally and vertically. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM VINYL

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a customer specified interior paint or protective coating.

HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of a approx 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of approx. 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation.

TRIM LH DASH

The left hand dash shall be constructed of approx. 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of approx. 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door if available

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of a minimum 0.25 inch closed cell foam with a minimum 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

POWER POINT DASH MOUNT

The cab shall include (1) 12 volt cigarette lighter type receptacles in the dash to provide a power source for 12 volt electrical equipment. The receptacles shall be wired battery direct.

CHARGING PORTS,12-VOLT DUAL USB

The cab shall include (1) Kussmaul model 091-219,12V USB dual charging port. The charging ports shall be wired battery direct and location to be approved by Fire Dept.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of 14 gauge 304 stainless steel with indented perforations. The perforations shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 7 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick 3003-H22 embossed aluminum tread plate. Alternate materials will be considered for middle step.

STEP TRIM KICKPLATE

The cab steps shall include a kick plate in the rise of each step. The risers shall be trimmed in 3003-H22 bright aluminum tread-plate.

UNDER CAB ACCESS DOOR

If the cab is so equipped with two (2) access doors, one in each of the left and right crew step risers. They shall be constructed of embossed aluminum tread plate with a push and turn latch.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 approx 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

DOOR TRIM SCUFF PLATE

The trim along the door shall include a stainless steel scuff plate traveling along the door jam and wrapping around from the interior to the exterior in an effort to prevent the chipping of paint should the

seat belt buckle come in contact with the door jam. It should run the entire height of the front and rear doors.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

CAB DOOR TRIM REFLECTIVE

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior lower section of each cab door.

INTERIOR GRAB HANDLE "A" PILLAR

If allowable there shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The handles shall assist personnel in entering and exiting the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR TRIM VINYL COLOR

The cab interior vinyl trim surfaces shall be black in color.

INTERIOR TRIM SUN VISOR

The header shall include two (2) impact resistant, transparent acrylic polycarbonate sun visors with a smoke gray tint shall be provided and installed on the header above the driver and officer.

The see thru visors are designed for maximum flexibility of positioning utilizing an arm with virtually unlimited adjustability.

The visors are easily adjusted and can be placed into a chosen position with one hand. The sun visors will help protect vehicle occupants from solar glare without obscuring their vision.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

CAB PAINT INTERIOR

The inner door panel surfaces shall be coated with a dark red, semi gloss finish, bed-liner material

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with a dark red, semi gloss finish, bed-liner material.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with dark red, flat finish, bed-liner material. Any accessory pods attached to the dash shall also be coated with this material.

TRIM LEFT HAND DASH INTERIOR PAINT

The left hand dash shall be coated with dark red, flat finish, bed-liner material.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be coated with dark red, flat finish, bed-liner material.

DASH PANEL GROUP

The main center dash area shall include three (3) aluminum removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The panels shall be coated with a black texture finish. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

Layout of all controls, switches, etc. to be approved by Fire Dept.NO EXCEPTIONS

SWITCHES LEFT PANEL

Layout of all controls, switches, etc. to be approved by Fire Dept.NO EXCEPTIONS

SWITCHES RIGHT PANEL

Layout of all controls, switches, etc. to be approved by Fire Dept.NO EXCEPTIONS

SEAT BELT WARNING

A Weldon seat belt warning system or equivalent, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the display and control screen(s) and a fast tone audible alarm. The wiring connections at each seat shall have heat shrink tubing applied so that the wiring cannot be easily disconnected to disable the system.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect

sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened. If available, a 5 second delay in activation will be programmed into the system.

SEATS

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear. All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat backs shall include the logo of the Fire Department. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Sierra model seat with air suspension. Equivalent brands can be considered but must be approved by the Fire Dept. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with a minimum of 5.00 inches of travel. The suspension control shall be located on the seat below the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver’s seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with a cab safety system. The system shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the system shall also provide ejection mitigation protection.

The driver's seating area shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

- Knee airbags if available

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom Sierra model seat with air suspension. Equivalent brands can be considered but must be approved by the Fire Dept. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with a minimum 5.00 inches of travel. The suspension control shall be located on the seat below the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat back shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING OFFICER

The officer's seat shall offer a special mounting position which is 2.00 to 8.00 inches rearward of the standard location offering increased leg room for the occupant.

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with a cab safety system. The system shall -selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the system shall also provide ejection mitigation protection.

The officer's seating area system shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

- Knee airbag - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard.

SEAT FORWARD FACING OUTER

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat back and cushion. The bottom cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include a hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted inboard from the side wall for additional clearance facing the front of the cab.

OCCUPANT PROTECTION FFO

The forward facing outer seat position(s) shall be equipped with a cab safety system . The system shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the system shall also provide ejection mitigation protection.

Each forward facing outer seating position shall include:

- Advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

SEAT FORWARD FACING CENTER

The crew area shall include one (1) forward facing center crew seat located directly behind the engine tunnel in the center of the cab.

The crew area shall include a seat in the forward facing center position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

There shall be a three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Motor Vehicle Safety Standard (FMVSS) No. 210, “Seat belt assembly anchorages”.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include a hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING CENTER

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

OCCUPANT PROTECTION FFC

The forward facing center seat position(s) shall be equipped with a cab safety system. The system shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the system shall also provide ejection mitigation protection.

Each forward facing center seating position shall include:

- Advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include an enclosed style seat frame located and installed at the rear wall. The seat frame will accommodate the placement of the seats above it. Height and leg room will be taken into account on the overall dimensions of the frame. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The forward corners of the bench shall be chamfered 45-degree. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area one (1) each side of the seat frame. Each access point shall be covered by a hinged door which will allow access for storage in the seat box.

CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual or single arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) or (1) windshield wipers which shall be affixed to a radial wet arm. The system shall include a motor(s) which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position. A single-piece windshield will require three (3) windshield wipers.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black/metal finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. The each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a Trimark or equivalent key from the exterior. The door locks are designed to prevent accidental lock out.

GRAB HANDLES

The cab shall include one (1) 18.00 inch three-piece knurled aluminum, anti-slip exterior assist handle, installed behind each cab door. The assist handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand.

REARVIEW MIRRORS

Ramco model 6015-FFHR-750HR bus style mirrors shall be provided. Other models will be considered but must be approved by the Fire Dept. The mirror heads shall be polished cast aluminum and shall measure 9.75 inches wide X 13.00 inches high with an additional top mount convex assembly. The mirrors shall be mounted one (1) on each front cab corner radius below the windshield with 15.00 inch long polished cast aluminum arms with 3" vertical risers.

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

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a button/switch on the display/dash and control screen.

EXTERIOR TRIM REAR CORNER

There shall be an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick on the outside corners at the back of the cab. The overlay shall wrap 1.00 inches forward on the sides of the cab and 12.00 inches inboard on the rear wall.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner a minimum of 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette made of 14 gauge 304 polished stainless steel. The inner liner shall include a 45-degree by 5 inch chamfered edge, with rounded corners on the interior corners of the liner.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

IGNITION

A master battery system with a keyless start ignition system shall be provided. The brand, model #, and location of the switches shall be approved by the Fire Dept.

Each switch shall illuminate a LED indicator light on the dash/switch when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERY

The single start electrical system shall include six (6) 1150 CCA batteries with a 205 minute reserve capacity each and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek or equivalent shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

If applicable, each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in an accessible area with sufficient distance between the studs. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR

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

BATTERY CONDITIONER

A Kussmaul 40 amp battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab behind the driver's seat, designed specifically for recharging the Odyssey sealed lead acid battery.

AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120 volt air compressor shall be supplied. The air compressor shall be temporarily installed horizontally behind the driver's seat for relocation by the body builder. The air compressor shall be plumbed to the air brake system to maintain air pressure. There shall be an additional 4.00 feet of wire and air line supplied.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:
Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION
An electrical inlet shall be installed on the left hand side of cab over the wheel well in the forward position.

ELECTRICAL INLET CONNECTION
The electrical inlet shall be connected to the battery conditioner and the air pump.

ELECTRICAL INLET COLOR
The electrical inlet connection shall include a red cover.

HEADLIGHTS

The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.

The headlights shall be located on the front fascia of the cab.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in a chrome housing above and outboard of the front warning and head lamps.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Whelen OS series LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a button/switch on the display/dash. There shall be a dimmer control on the display/dash to adjust the brightness of the dash lights. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position.

GROUND LIGHTS

The vehicle shall include pre-wiring for incandescent NFPA compliant light heads with the light activation by the opening of the door on the respective cab side as well as through a button/switch on the display and control screen.

STEP LIGHTS

The middle step located at each door shall include one (1) On-Scene brand Night Stik LED strip light which shall activate with the opening of the respective door. The step light shall be mounted in a polished aluminum bezel.

ENGINE COMPARTMENT LIGHT

There shall be two (2) LED NFPA compliant lights mounted under the engine tunnel for area work lighting on the engine. The lights shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The lights shall activate automatically when the cab is tilted.

INTERIOR OVERHEAD LIGHTS

The cab shall include a Tecniq E20-WC0R-1 LED dome lamp or equivalent located over each door. The dome lamps shall include both red and clear bulbs. The dome lamps shall be in a bezel. The light shall be activated by a three position toggle switch or equivalent and shall be activated by opening the respective door and shall override the active light regardless of which position the switch is in and shall return to the current switch position when the door is closed.

An additional two-section, red and clear Whelen LED dome lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include two (2) flashing Whelen OS Series LED lightheads, one (1) red LED and one (1) amber LED, clearly labeled "Do Not Move Apparatus". In addition to the flashing lights, an audible alarm shall be included which shall sound while either light is activated.

Each flashing light shall be approximately 1.50 inches long X 1.00 inches wide X 0.50 inches high and shall be located centered left to right for greatest visibility.

The red light shall be interlocked for activation when all cab/body doors/access ladders are not firmly closed/stored and the parking brake is released. The amber light shall be wired to the apparatus body by the OEM when aerial is raised out of the cradle or the outriggers deployed.

MASTER WARNING SWITCH

A master switch shall be included, as a button/switch on the display/dash and control screen which shall be labeled “E Master” for identification. The button shall feature control over all devices wired

through it. All warning device switches/buttons linked to the master switch/button shall activate and power up when depressed and power down when depressed again.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a button/switch on the display/dash and control screen.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the “DoubleFlash 150” left/right flash pattern.

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the “DoubleFlash 150” left/right flash pattern.

The warning lights mounted on the cab front fascia in the outboard position shall be red with a clear lens.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a button/switch on the display/dash and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be set to flash pattern DoubleFlash 150 left/right.

The intersection lights shall be red with a clear lens.

The intersection lights shall be recess mounted into the side face of the bumper.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. The light shall be programmed to emit the "DoubleFlash 150 left/right" flash pattern.

The warning lights located on the side of the cab shall be red with clear lens.

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

AUXILIARY SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen series M6 Super LED 4.00 inch X 6.00 inch warning lights, one (1) each side, which shall feature multiple flash patterns including steady burn. The warning lights shall be set to flash pattern ninety-two (92) DoubleFlash 150 L/R.

The auxiliary warning lights located on the side of the cab shall be red with clear lens.

The auxiliary warning lights on the side of the cab shall be mounted center on the “C” pillar in the raised roof position.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through master warning and a button/switch on the display/dash and control screen. This button shall be clearly labeled for identification.

SIREN CONTROL HEAD

A Whelen 295HFSC9 electronic siren control head shall be provided. The siren head shall feature a 200-watt output, wail, yelp, manual siren, and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected. The siren shall be mounted in an approved location by the Fire Dept.

HORN BUTTON SELECTOR SWITCH

A button/switch on the display/dash and control screen shall be provided to allow control of the electric horn or the air horn from the steering wheel horn button. The horn button selection shall default to the air horn each time the screen power is cycled off and on. The electric horn shall sound when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and a right hand side Linemaster model SP491-S81 foot switch for the officer. Location to be approved by Fire Dept. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by two (2) Linemaster model SP491-S81 foot switches mounted in the front section of the cab for use by the driver and officer. A siren brake button/switch shall be provided on the display/dash. A red momentary rocker switch shall also be provided on the Offeicers side of dash .

The siren activation shall be interlocked with the park brake and shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model backup alarm shall be installed at the rear of the chassis with an output level of 87-107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring. The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the screen. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an indicator bar/gauge displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured data. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in

increments of 25% of useable DEF in green.DEF gauge is also acceptable. Upon decreasing levels, the indicator bar/gauge will notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

RED LAMPS
Stop Engine-indicates critical engine fault
Air Filter Restricted-indicates excessive engine air intake restriction
Park Brake-indicates parking brake is set
Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened
Low Coolant-indicates engine coolant is required

AMBER LAMPS
MIL-indicates an engine emission control system fault
Check Engine-indicates engine fault
Check Trans-indicates transmission fault
High Transmission Temperature-indicates excessive transmission oil temperature
ABS-indicates anti-lock brake system fault
Wait to Start-indicates active engine air preheat cycle
HEST-indicates a high exhaust system temperature
Water in Fuel-indicates presence of water in fuel filter
DPF-indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration has been postponed due to user interaction
Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.
SRS-indicates a problem in the RollTek supplemental restraint system
Check Message-Turn Signal On
Check Message-Door Ajar
Check Message-Cab Ajar
Check Message-ESC Active
Check Message-DPF Regen Active
Check Message-No Engine Data
Check Message-No Transmission Data
Check Message-No ABS Data
Check Message-No Data All Communication With Vehicle Systems Has Been Lost
Check Message-Check Engine Oil Level
Check Message-Check Washer Fluid Level
Check Message-Check Power Steering Fluid Level
Check Message-Low Transmission Fluid Level
Check Message-Check Coolant Level

GREEN LAMPS
Left and Right turn signal indicators
ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle-indicates engine high idle is active.
Cruise Control-indicates cruise control is active
OK to Pump-indicates the pump engage conditions have been met
Pump Engaged-indicates the pump is currently in use

Auxiliary Brake-indicates secondary braking device is active

BLUE LAMPS
High Beam Indicator

CONSTANT AUDIBLE ALARMS FROM GAUGE PACKAGE
High Trans Temp
High or Low Voltage
Seatbelt
Check/Stop Engine
Check Transmission
Low Air Pressure
Fuel Low
Water in Fuel
ESC
High Coolant Temperature
Low Engine Oil Pressure
Low Coolant Level
Low DEF Level
Air Filter Restricted
Extended Left and Right Turn Remaining On
Cab Ajar
Door Ajar
ABS System Fault
SRS (Supplemental Restraint System) Fault

EXTERNAL AUDIBLE ALARMS
Air Filter
Cab Ajar
Door Ajar
Seatbelt
Check/Stop Engine
Low Air Pressure
Water in Fuel
Low DEF
ABS System Fault
SRS (Supplemental Restraint System) Fault
High or Low Voltage

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using blue or alternative LED backlighting.

CAMERA

An heavy duty rearview camera syste shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle.

The camera shall be wired to a 7.00 inch flip down monitor or alternative which shall include a color display and day and night brightness modes installed/displayed by the driver. Location to be approved

by the Fire Dept. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

If available, the camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

The cab and chassis shall include diagnostic software for the cab safety system shipped loose with the vehicle. The software kit shall include an interface module with connectors to link a laptop computer to the vehicle for diagnostic purposes.

WARRANTY

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the end user. The warranty shall include conditional items listed in the detailed warranty document which shall be provided upon request.

CHASSIS OPERATION MANUAL

There shall be two (2) complete sets of chassis operation manuals provided with the chassis. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy. Each manual shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:
(1) Digital copy of the Engine Owner's manual
(1) Digital copy of the Transmission Operator's manual
(1) Hard copy of the Engine Operation and Maintenance manual with CD

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams. One (1) set shall be a printed hard copy, one (1) set shall be a digital copy.

AS BUILT AIR PLUMBING DIAGRAM

The cab and chassis shall include two (2) complete sets of the as built air plumbing system and option air plumbing diagrams. One (1) set shall be a printed hard copy and one (1) set shall be a digital copy.

AS BUILT FUEL PLUMBING DIAGRAM

The cab and chassis shall include two (2) copies of the as built fuel system plumbing diagram. One (1) shall be a printed hard copy, one (1) shall be a digital copy.

HIGH WATER PERFORMANCE REQUIREMENT

The Apparatus specified shall be capable of operating in 40” of water with no permanent damage. It is understood that if the air filter is below 40” that the intake shall be above the 40” requirement.

CUSTOMER INSPECTION

There shall be a customer inspection of the chassis at the manufacturer’s plant. The dealer, or the OEM shall be responsible for all travel costs and arrangements.

The date of the chassis inspection shall be determined based on the requested chassis completion date, OEM production schedules, the chassis off-line date, and the chassis completion date.

The inspection must be coordinated between the OEM/Dealer representative and the HFD.

CAB TILT CONTROL

There shall be a cab tilt pendant control provided and installed in a right front compartment of the apparatus. Location to be approved by Fire Dept.

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

FUEL FILL ASSEMBLY

There shall be an aluminum fuel fill assembly located on the apparatus body accessing the chassis supplied fuel tank on both the left and right side of the apparatus. The assembly shall be located in the area that best suits efficient fuel filling with the space appropriated. The fuel fill assembly will have a polished aluminum frame with a no door. There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be automotive type screw on green in color with a tether. There shall be a label near the fuel fill door labeled "DIESEL FUEL ONLY". The fuel fill pipe shall have a minimum 3/8" inside diameter vent line (above 40”) installed from the top of the fuel tank to the fill tube.

TOOL STORAGE PANEL

There shall be a 3/16" aluminum "L" wall (iron storage) shall be installed behind the driver’s seat. The wall shall be approximately 37" tall or the height of the PAC TRAC iron mount. There shall be a floor that is attached to the two side panels. The entire tool panel shall be secured to the "B" pillar. This panel shall be installed behind the driver’s seat.

The panel shall be sprayed to match the interior cab finish.

BATTERY CHARGER DISPLAY

A Kussmaul battery charger, single bar graph display, shall be furnished and installed to the drivers seat box. Model utilized will be compatible with the Kussmaul battery conditioner. LED display shall be wired so to display the battery charge at all times even without the Kussmaul plugged in. Location to be approved by Fire Dept.

AIR TANK DRAIN CABLES (extended)

There shall be manual pull air tank drain cables provided with the apparatus. The cables shall be extended to the outer edge of the apparatus below L3 or other approved locations to facilitate draining moisture from the chassis air tanks. A label shall be affixed indicating “Air Tank Drain”.

HOSE AND HARNESS ROUTING

Any wiring harness or hydraulic /air hoses that must pass to the outside of the frame will not run over or under the frame flanges. Hydraulic and airlines will pass through the frame using bulkhead fittings. All battery cables will also utilize bulkhead fittings. Wiring harnesses will pass through the frame within a protective rubber boot. For ease of maintenance, the hydraulic air hoses and electrical wiring harness will be ran separately down each side of the frame rails. The hydraulic and air hoses run down the right side of the frame rails, and the electrical harnesses run down the left side of the frame rails.

RADIO & ANTENNA MOUNTING BASE

There shall be two (2) Larsen GPSDM700/2500FFS roof mounted antennas for two-way radios/MDC/G-1 Tablet installed on the apparatus. The mounts shall be located on the cab roof in a best fit location determined by manufacturer but shall be at a minimum 36" apart. The cable shall be routed to the radio compartment with enough cable for the customer to route to the instrument panel if needed.

There shall be a PS MM-Clevis G-1 Tablet mount/display cradle with 75mm VESA pattern or G Cradle with Gamber Johnson upper pole assembly mounted within the cab. Location to be determined at preconstruction.

There will also be two (2) speakers installed in the cab per Fire Dept specifications to include locations.

There will also be one (1) customer supplied radio installed flush in a dash panel. Location to be approved by Fire Dept.

There shall be one (1) Gamber Johnson GJ DS-56 MDC horizontal surface base, with a Gamber Johnson GJ 7160-0419 Tilt/swivel motion attachment installed on the apparatus. Location to be approved by Fire Dept.

There shall be one (1) CF-AA5713AM-TM AC Power Adapter for the Panasonic MDT laptop installed in the cab as directed by Fire Department. Location to be approved by Fire Dept.

CHASSIS REQUIRED LABELING

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided. The signs shall be visible from all seating positions.

There shall be a lubrication plate mounted inside cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

Engine oil
Engine Coolant
Transmission Fluid
Pump Transmission Lubrication Fluid (if applicable)
Drive Axle Lubrication Fluid
Generator Lubrication Fluid (if applicable)
Tire Pressures
And any other fluids/lubricants deemed by manufacturer

APPARATUS INFORMATION LABEL

There shall be a high-visibility label installed in a location clearly detectable to the driver while in the seated position.

The label shall indicate the following specified information.
Overall Height listed in feet and inches.
Overall Length listed in feet and inches.
Overall GVWR listed in tons.

CAB HELMET WARNING LABEL

A high-visibility label shall be installed in a location clearly detectable from each seating position. The label shall indicate the following specified information.

“DO NOT WEAR HELMET WHILE SEATED”

HELMET RESTRAINTS

All NFPA required helmet restraints will be supplied and installed by the Customer prior to the truck being placed into service.

MUD FLAPS

Heavy-duty rubber mud flaps shall be provided behind the rear wheels. The mud flaps shall be black rubber type and be bolted in place.

EXHAUST HEAT SHIELD

There shall be an exhaust heat shield added to the chassis provided exhaust. The shield shall be provided under any compartment over the exhaust and shall incorporate a heavy duty spray on insulation. With this shield the temperature of the affected compartments shall not exceed the ambient temperature.

PLATFORM AERIAL WATERWAY

The aerial waterway shall have an inlet at the rear of the apparatus.

HALE MASTER INTAKE VALVE - MANUAL DRIVE

There shall be valve with hand wheel installed on the aerial waterway rear inlet. The valve shall have a built-in pressure relief valve (to be set at final), sealed gear drive, bronze body construction, and an indicator package.

There shall also be installed with this valve one-(1) air bleeder valve.

A Class 1 or equivalent 3.5" (88mm) gauge shall be supplied for the pressure reading 0-400 psi. The gauge shall be a model Class 1 LFP-310 and be installed at the rear of the truck for reading inlet pressure from the rear of the truck.

The termination shall include the following components:
One (1) 5” NST adapter.
One (1) 5” NST female by 5”Storz cast aluminum 30 degree elbow.
One (1) 5” female Storz self-venting cap, secured by a chain.
One (1) 5" Storz by 4" HFD thread adapter (shipped loose).

Space Frame Body - ALUMINUM

The apparatus body shall be a Space Frame design, which serves as the structural skeleton to support the body and its contents. The entire formed structure shall be welded together utilizing an A.W.S. Certified welding procedure.

Body Structure Members: The body shall have square, rectangular and channel structural members in certain areas of the body. The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members varies from .125 to .250 throughout, dependent on the design requirement.

Body Material Type: All body structural members shall be Aluminum 6061-T6 alloy material. All .125 sheet material shall be Aluminum Alloy 5052-H32 and .250 sheet materials shall be Aluminum Alloy 3003. These alloys are required because it provides optimum all around performance for strength, manufacturing properties, and corrosion resistance.

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor.

Front Body Compartment Walls: The front compartment walls of both forward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments.

Rear Body Compartment Walls: The rear compartment walls of both rearward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments. Access panels from the rear walls shall be strategically placed to ensure access to the rear taillight clusters for any servicing that may be completed.

Compartment Top: The top of the compartments shall be an integral portion of the body. No overlay material shall be visible from the interior of the compartments.

Compartment Floors: The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and form a “sweep-

out" compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal or a roll up type door as specified.

Compartment Load Capacity: Each compartment shall have a minimum of one additional structural compartment floor support centered on the underside of the compartment floor. This additional member shall be integral with the rest of the body structure. Each compartment must be designed to carry a working load of:
Full depth side compartment: 1,000 lbs per compartment
Half depth side compartment: 750 lbs per compartment.

OVERLAYS

The entire front face of the apparatus body shall have raw aluminum or aluminum diamond plate overlays installed.

The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

The front of the apparatus body, vertical wall overlay shall be integrated with a 1/8" aluminum diamond plate corner trim pieces for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The rear face of the apparatus body, vertical wall overlays shall be installed with a 1/8" aluminum diamond plate 1.0" x 1.0" corner trim piece, for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The vertical edge trim piece that is protecting the chevron striping surface or that is utilized for the purpose of striping, shall be secured utilizing fasteners only.

REAR TAILBOARD

On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901).

The rear step will be made from .25" painted steel and shall extend 3" deep x 5" tall.

CATWALKS

The catwalks shall be constructed with materials of a non-slip embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturer's recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the proposal.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Material Data Safety Sheet".

The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications.

Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials). BMS 10-72A (Boeing Material Specifications).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body, will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects. The coating will meet the following test performance properties as a minimum standard.

BODY PAINT COLOR

The apparatus body shall be painted 926326 RED.

COMPARTMENT FINISH

The compartment interiors shall be coated with bed-liner. The color shall be medium gray.
Other proposals to be considered and approved by the Fire Dept.

GENERAL BODY DETAILS

All compartmentation shall be constructed in a sweep out design to be water and dust resistant, and manufactured to the maximum possible storage capacity.

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. The Manufacturer may be requested to supply evidence of fastener coating and results of salt spray testing when dissimilar metals are used. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

WHEEL WELLS

Wheel wells shall have semicircular black polymer composite or metal inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

WHEEL WELL MODULES

The body wheel well area shall be fabricated of smooth aluminum and finish painted. There shall be “smart storage” compartmentation features incorporated on each side of the apparatus body wheel well modules to utilize and maximize storage space availability. The doors will be 3/16” painted aluminum.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 1-hour carbon fiber SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located in front of the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold four (4) 1-hour carbon fiber SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located between the axles on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 1-hour carbon fiber SCBA bottles with 1" safety loops installed.

The compartment shall be located behind the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 1-hour carbon fiber SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located in front of the axles on the right side.

STORAGE COMPARTMENT

There shall be a storage compartment for three (3) fire extinguishers as follows: 20 pound ABC, 15 pound CO2, and 2.5 gallon water.

The compartment shall be located between the axles on the right side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 1-hour carbon fiber SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located behind the axle on the right side.

DOOR OPEN INDICATOR

Each smart storage compartment door shall have a black magnetic style switch.

If the door is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the red “Door Open” indicator light in the cab to warn the crew.

BODY STRUCTURE WIDTH

The width of the apparatus body from the outside of the left compartments to the outside of the right compartments ***shall be 99"*** excluding any attached peripherals such as rub rails, fenderettes, grab handles, etc.

AERIAL BODY MOUNTING SYSTEM

The complete apparatus body shall be modular in construction and built separately from the chassis. The apparatus body shall be mounted to the chassis framework with angular framework hangers. The body shall be combination bolted and welded to the hangers to reduce fatigue of the body material in mounting locations. The hangers shall reach out underneath the body compartmentation to serve as a full-width under body support in several areas along the length of the body side.

During installation of the mounting system all welding to the chassis frame rails and all drilling will be performed within the parameters established by the chassis manufacturer. Under no circumstances shall any drilling be done in the upper or lower flanges between the axles.

COMPARTMENT VENTILATION

To allow for proper air circulation & flow, each compartment shall have a venting route. The venting locations shall be determined by best-fit for each body configuration. Louvered plate vents shall be installed appropriately inside all of the compartment interior walls.

SIDE COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed in all apparatus body “SIDE” compartments, to accommodate the installation of shelves, trays, tool boards and or other miscellaneous equipment.

COMPARTMENTATION

The following compartments shall be supplied on the apparatus:
Consideration will be taken into account due to varying manufacturing designs.

Compartment "L2": There shall be one (1) compartment located above the forward outriggers on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 31.0" wide x 23.5" high with a depth of 25.5". The framed opening shall measure approximately 28.5" wide x 20.5" high.

This compartment shall have a painted lift up hinged door with a D ring handle latch and gas shock hold open device.

Compartment "L3": There shall be one (1) full height compartment forward of the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 40.5" wide by 74.0" high with a depth of 25.5" and transverse above the torque box area. The framed opening shall measure approximately 38.0" wide by 71.0" high.

Compartment "L4": There shall be one (1) compartment located above the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62.0" wide by40.0" high with a depth of 25.5”. The framed opening shall measure approximately 62.0" wide by 37.0" high.

Compartment "L5": There shall be one (1) compartment located above the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 54.0" wide by 29.0" high with a depth of 25.5” and transverse above the torque box area. The framed opening shall measure approximately 51.5" wide by 26.0" high.

COMPARTMENTATION (continued)

Compartment "L6": There shall be one (1) compartment located rearward of the rear axle on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 46" wide by 63.0" high with a depth of 21". The framed opening shall measure approximately 43.5" wide by 60.0" high.

Compartment "L7": There shall be one (1) compartment located above the rear outriggers on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 31.0" wide by 11.0" high with a depth of 21.0". The framed opening shall measure approximately 28.5" wide by 8.0" high.

This compartment shall have a painted lift up hinged door with a D ring handle latch and gas shock hold open device.

Compartment "R2": There shall be one (1) compartment located above the forward outriggers on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 31.0" wide x 23.5" high with a depth of 25.5". The framed opening shall measure approximately 28.5" wide x 20.5" high.

This compartment shall have a painted lift up hinged door with a D ring handle latch and gas shock hold open device.

Compartment "R3": There shall be one (1) full height compartment forward of the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 40.5" wide by 74.0" high with a depth of 25.5".

Compartment "R4": There shall be one (1) compartment located above the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62.0" wide by40.0" high with a depth of 25.5” and transverse above the torque box area. The framed opening shall measure approximately 62.0" wide by 37.0" high.

Compartment "R5": There shall be one (1) compartment located above the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 54.0" wide by 29.0" high with a depth of 25.5” and transverse above the torque box area. The framed opening shall measure approximately 51.5" wide by 26.0" high.

Compartment "R6": There shall be one (1) compartment located rearward of the rear axle on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 46" wide by 63.0" high with a depth of 21". The framed opening shall measure approximately 43.5" wide by 60.0" high.

Compartment "R7": There shall be one (1) compartment located above the rear outriggers on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 31.0" wide by 11.0" high with a depth of 21.0". The framed opening shall measure approximately 28.5" wide by 8.0" high.

This compartment shall have a painted lift up hinged door with a D ring handle latch and gas shock hold open device.

AERIAL COMPARTMENT

There shall be one (1) compartment “L1/R1” located directly behind the aerial ladder boom support on each side of the apparatus. The approximate interior dimensions of these compartments shall be a minimum of 53" wide by 64" high. The lower 21" of the compartment shall be 22.5" deep and the upper area shall be transverse. The door openings shall measure approximately 49" wide by 55" high. The compartment will have approximately 109 cubic feet of space.

This compartment shall have a roll-up door on both sides.

ROLL-UP DOOR CONSTRUCTION

All compartment doors shall be roll-up style doors.

The roll up doors shall be R.O.M Corporation brand. The door slats shall be of a double wall box frame extrusion. Exterior surface shall be flat and the interior surface shall be concave to prevent loose equipment from jamming the door. The slats will be anodized to prevent oxidation and there shall be inner-locking end shoes on every slat, secured by a punch and dimple process. The slats shall have interlocking joints with a folding locking flange. There shall be a PVC/Vinyl inner seal between each slat to prevent metal to metal contact.

The track shall be of a one piece aluminum design with an attaching flange and finishing flange incorporated into its design to facilitate installation and provide a pleasing finished look without additional trim or caulking. The track shall have a replaceable side seal to resist water and dust intrusion into the compartment.

The drip rail shall be fabricated of aluminum and have a built in replaceable wiper seal. The Roll-up door shall have a 4" diameter counterbalance, to assist in lifting while eliminating the risk of accidental closing. The door shall be secured by a full width lift bar, operational by one hand with heavy gloves. The securing method will be of a positive latch device design.

SIDE COMPARTMENT DOORS/TRACK/TRIM/WET PAINTED
The side compartment roll up doors, track and trim shall be wet finish painted to color match the apparatus body.

ROLL-UP DOOR PROTECTORS
There shall be a protective cover installed under each body compartment door roll to protect the door in the rolled up position. Each cover shall be fabricated of smooth aluminum and of natural finish.

SIDE ROLL-UP DOOR ASSIST STRAPS
There shall be nylon straps installed on both left and right body side 'high side' compartment doors, to assist in closing the door. The strap shall be attached to each door and shall be permanently mounted to the rearward wall with footman loops using nutzerts, half way between the top and bottom of the compartment.

DOOR OPEN INDICATOR
Each roll up door shall have an integral door open indicator magnet in the lift bar. If the bar is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew.

SILL PLATES

Mirrored stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

OVER-WHEEL COMPARTMENT PARTITIONS

Compartment partitions, fabricated of the same material as the body, shall be welded in place in all over-wheel compartments flush to the forward and rearward frame openings.

These partitions shall aid in keeping loose equipment from falling into the fore and aft compartments.

FENDERETTES

Four (4) polished stainless steel fenderettes shall be provided on body rear wheel well openings, two (2) each side. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to resist deterioration.

REAR CENTER LADDER STORAGE AREA

There shall be a rear center storage area constructed for ladder storage. The ladder storage area shall utilize the area enclosed by the torque box of the aerial device. The ladder storage area shall be constructed as large as possible within the confines of the torque box area.

The ladder storage area shall be used to store ground ladders on edge. The area shall be divided to allow removal of any such ladder without disturbing the storage of any other. The ladders shall be

stored on slides to separate the ladders from each other. The lower slides shall be fabricated of extruded polyester structural angles for low friction and prevention of damage to ground ladder rails. The upper slides shall be fabricated of formed aluminum laminated with polypropylene wear pads to hold the ladders in alignment and prevent metal to metal contact between the ladders and slides. The ladder slides shall be bolted in place for easy removal.

Ladder stops shall be provided at the front of the ladder slides to prevent the ladders from sliding forward. A hinged ladder stop shall be provided at the rear to prevent the ladders from sliding rearward and fouling the roll-up door.

The ladder storage area shall also be utilized for storage of any other miscellaneous equipment, such as pike poles and miscellaneous equipment as available space allows.

A roll-up door shall be provided over the rear ladder storage area to provide access to the storage area and prevent dirt and road grime from drafting into the area.

The storage shall be large enough for the following ladder complement:
-One (1) Alco Lite 35' 2 Section Ladder
-One (1) Alco Lite 50' 3-Section Ladder
-Two (2) Alco Lite 28' 2 Section Ladder
-Two (2) Alco Lite 16' Roof Ladder
-One (1) Alco Lite 10' Aluminum Folding Ladder
-One (1) Alco Lite 12' Folding Ladder

The storage shall be large enough for the following pike pole complement:

One (1) 6' Pike Pole (regular handle)
One (1) 8' Pike Pole (regular handle)
One (1) 12' Pike Pole (regular handle)
One (1) 6' New York Hook "Z" Hook (regular handle)
One (1) 8' New York Hook "Z" Hook (regular handle)
One (1) 12' New York Hook "Z" Hook (regular handle)

There shall be a stop in the front of each slot to prevent the pike poles items from sliding forward.

The pike poles shall be in individual tubes in an individual compartment inside the torque box behind a latched aluminum door. The compartment and door will be finished with medium gray speedliner.
Other storage options to be considered and approved by the Fire Dept.

OUTRIGGER ACCESSORIES

The outriggers shall be controlled from the rear of the apparatus. A control box with a hinged door shall be furnished on each side, installed per NFPA, lighted for night operations. There will be a Fire Dept approved location, side to side indicator furnished and installed at the rear of the apparatus to aid in leveling the unit.

There will be two (2) outrigger pad mounting/storage slots furnished below the body, one (1) each side, adjacent to the forward stabilizer. They will be mounted below the body on the left and right side under the appropriate compartments. They will have a retainer installed to prevent the pad from floating away in high water.

OUTRIGGER COVERS

Brushed stainless steel covers shall be installed over the front and rear outrigger areas, one on each side of the apparatus, front and rear. Each cover shall mount directly to the outrigger stabilizer arm and extend with the outrigger.

TURNTABLE ACCESS

There will be ground-to-turntable access ladders provided, one (1) each side at the left and right rear corners of the body. Each ladder will be constructed from aluminum plate and five (5) heavy-duty cast aluminum steps. To assure a safe climbing angle, the uppermost portion of each ladder will be immediately adjacent to the upper fire body, while the lowest step on the ladder will be approximately 14” from the edge of the body and shall be fold out design. There shall be (2) full height grab rails at each access step area.

The steps will each measure a minimum of 16” wide x 6” deep and placed on approximate 13” centers. Steps will be open grip type with a raised, slip-resistant surface, exceeding the requirements of NFPA 1901, 15.7.4. The steps will be attached to side rails constructed of minimum 1/2” thick x 3” wide aluminum plate, creating a sturdy, long lasting structure.

SHELVING

Each shelf shall be fabricated of 3/16" thick aluminum sheet material with the outside and inside edges flanged up 2" to prevent equipment from sliding off. Each shelf shall be as wide as possible to allow proper attachment to uni-strut channels. Each shelf shall be adjustable up and down.

The following shall be provided:

A {25.5”} deep shelf shall be supplied and installed in the compartment. Each shelf shall be as wide as possible with no rear lip and mounted permanently at the transverse compartment floor height. There shall be a total quantity of four (4).

- One (1) located in the L-3 compartment.
- One (1) located in the L-4 compartment.
- One (1) located in the L-5 compartment.
- One (1) located in the R-4 compartment.

ROLL OUT TRAY

Each tray shall be fabricated of 3/16" thick 3003 grade or higher aluminum with four 3” side flanges; corner welded for maximum strength. Each tray shall be as wide and deep as the door allows and secured to a “heavy duty” slide assemblies. The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a lock-in, lock-out (FDR) front drawer release system or equivalent.

The following shall be provided:

A {300#} capacity tray with {100%} extension shall be installed to the compartment floor. There shall be a total quantity of five (5).

- One (1) located in the L-1 compartment.
- One (1) located in the L-3 compartment.
- One (1) located in the L-6 compartment.
- One (1) located in the R-1 compartment.

- One (1) located in the R-6 compartment.

A {300#} capacity tray with {100%} extension and adjustable height utilizing uni-strut materials shall be installed. There shall be a total quantity of three (3).
- One (1) located in the L-3 compartment.
- One (1) located in the L-6 compartment.
- One (1) located in the R-6 compartment.

ROLLOUT TRAY/ONSCENE

Each tray shall be fabricated of 3/16" thick 3003 grade or higher aluminum with four 3” side flanges; corner welded for maximum strength. Each tray shall be as wide and deep as the door allows and secured to an (On Scene) rollout slide system constructed of anodized aluminum extrusions and assembled using stainless steel fasteners (no welds).

The slide shall use a three extrusion rail design utilizing twelve to sixteen (12-16) urethane rollers. he roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. The slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed and full extension positions.

The following shall be provided:

A {1000#} capacity tray with {100%} transverse directional extension shall be supplied and installed. There shall be a total quantity of one (1).
- One (1) located transversely between L-1/R-1 compartments.

TRANSVERSE ROLL-OUT TRAY DIVIDER

The transverse roll-out tray shall contain a vertical tray divider. The divider shall be fabricated of 0.25” thick 3003 grade or higher aluminum material and shall be mounted on unistrut so that it can be moved from side to side in the tray and be as long as the interior portion of the tray.

The divider shall be incorporated with a hand hole cut into each end and be gusseted in the center for added strength and rigidity.

The divider shall be manufactured as tall as possible, within the limits of any overhead obstructions.

The divider shall be of natural aluminum finish and allow for equipment mounting.

PULL-OUT TOOL BOARD/ALUMINUM

An aluminum pull-out tool board shall be installed in the compartment as specified.

The tool board shall be attached to uni-strut material mounted on the floor and ceiling of the compartment, extending perpendicular to the rear wall, allowing for horizontal adjustment from front to rear.

The tool board shall be mounted on ball bearing slides, top and bottom.

A locking device shall be installed on the lower slide to keep the board in the stored and extended

positions.

There shall be a total quantity of three (3).
- Three (3) located in the R-3 compartment.

O2 STORAGE

There shall be a free standing, permanently mounted, rescue equipment storage compartment provided and installed with the apparatus. The compartment shall be constructed of 1/8" smooth aluminum and allow access from either side if mounted in a transverse designed section. The interior floor of the compartment shall be lined with black ABS plastic for ease of stowing and un-stowing equipment.

Two (2) oxygen cylinders shall be stored in individual storage slots. The slot shall be wide enough to accommodate one (1) cylinder and it shall be removable without disturbing the storage of the another.

The compartment will be mounted in the R4 compartment on the right side below the transverse area to the floor/ceiling.

The compartment shall incorporate an hinged aluminum door with a push button latch on the end of the compartment to securely retain the equipment during transit.

SIDE RUB RAILS (ALUMINUM CHANNEL)

The lowest edge of the apparatus body side compartments shall be trimmed with brightly anodized aluminum channel rub rail material.

The rub rails shall be approximately 3.00" high with flanges turned outwards for increased rigidity, with each end chamfered to a 45 degree angle. The rub rails shall not be constructed as an integral part of the apparatus body structure, allowing each rub rail to be easily removed in the event of damage.

The rub rails shall be secured with stainless steel fasteners and spaced away from the apparatus body with ½" nylon spacers, to help absorb moderate side impacts and prevent the collection of water and debris for easier cleaning.

BODY ROOF

The roof of the body shall be overlaid with materials of a embossed aluminum diamond plate required to meet minimum NFPA standard requirements for slip resistance.

CHROMED TOW EYES

There shall be two tow eyes installed on each rear frame rail. The tow eyes shall be connected directly to the frame rails and extend outside the rear vertical wall. The tow eyes are to have an inside diameter of approximately 2" and shall be chrome plated

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Logic Controlled, Low-Voltage (12v) Electrical System, compliant with the latest revision of the NFPA 1901 standard guidelines.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system

shall be capable of switching loads (similar to operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or system modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as extra harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and an apparatus-specific reference of I/O shall be furnished in the final delivery manuals. These drawings shall illustrate the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus manufacturer shall not be accepted.

All nodes will be relocated to the inside of the body with covers.

LED DOT LIGHTING

There shall be a total of eleven (11) red clearance lights and two (2) amber clearance lights on the apparatus. There shall be seven (7) red clearance lights located on the rear of the apparatus, three (3) lights shall be in the rear bumper and two (2) lights shall be as high and wide as possible. On the sides of the apparatus there shall be four (4) red clearance lights, two (2) located on each side of the apparatus in the rub rails at the front and rear portion of the rear compartments. Additionally on the sides of the apparatus there shall be two (2) amber clearance lights, one (1) located on each side of the apparatus in the rub rail at the rear portion of front compartments.

There shall be four (4) amber intermediate turn signals located on the sides of the apparatus. They shall be located two (2) on each side of the apparatus in the rub rail, one (1) at the front of front compartments and one (1) at the front of the pump compartment. Lights to burn steady when lit.

The lights shall be Whelen OS series LED red and amber markers. The three in the center of the rear bumper shall be individually recess mounted.

There shall also be two (2) Britax rubber mounted marker lights mounted on the body one (1) each side as far to the rear as possible.

LED REAR TAIL LIGHT WARNING CLUSTER

There shall be a Whelen M6-Series Super LED Quad-Cluster, rear tail light cluster provided and installed in individual polished bezels on the rear of the apparatus, one each side. The cluster shall consist of the following specified components:

1 - Whelen #M6BTT LED red brake light
1 - Whelen #M6T LED series amber turn signal light
1 - Whelen #M6 BUW LED clear backup light
1 - 4X6 spot for the warning lamp specified below

BACKUP LIGHTS
The backup lights shall illuminate when the apparatus is placed in reverse.

ON SCENE "Night Stick" COMPARTMENT STRIP LIGHTING

One (1) "Night Stick" LED strip lights shall be installed in four (4) high side upper compartments.

Two (2) "Night Stick" LED strip lights shall be installed in four (4) over wheel compartments.

Two (2) "Night Stick" LED strip lights shall be installed in six (6) full height compartments.

Two (2) "Night Stick" LED strip lights shall be installed in the rear center compartment.

PERIMETER LIGHTS

There shall be fourteen(14) On Scene 18" LED strip underbody perimeter lights furnished and installed. One (1) under each side of the front bumper, one (1) under each cab door, one (1) each side of the body first compartment, one (1) each side of a body middle compartment, one (1) each side of the body last compartment, and one (1) under each side of the rear step to illuminate the ground around the truck.

UPPER LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

ZONE A: There shall be a pair of Whelen model FNMINI 24" Edge Ultra Freedom lightbars provided and installed with the apparatus. The lightbar shall each house two (2) front corner red linear LEDs, one (1) front white linear LED and one (1) side red linear LED. The outer lenses shall be clear.
A 3M Opticom system, model 792H shall be installed on the front of the platform, between the monitors, to the bottom of the horiztal surface in a tread plate housing.

ZONE C: One (1) pair of Whelen, model M6RC 4"x6"flashing (flash pattern 92) red LED lights with clear lenses and chrome bezels shall be provided and installed on the apparatus. One (1) each side in the upper rear corners of the apparatus body.

LOWER LED WARNING LIGHTING

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

ZONE A: The warning lights shall be provided with the chassis.

ZONES B&D: There shall be four (4) Whelen model M6RC 4"x6" flashing (flash pattern 92) red LED lights with clear lenses and chrome bezels, provided and installed with the apparatus. Two (2) on each side of the apparatus on the outrigger panels centered.

ZONE C: There shall be two (2) Whelen model M6RC 4"x6" flashing (flash pattern 92) red LED lights with clear lenses, provided and installed on the rear of the body inside the rear tail light warning cluster.

ADDITIONAL WARNING LIGHTS

In addition to the NFPA warning light package, there shall be six (6) Whelen ION Series red LED lights with clear lenses installed three (3) each side. The lights shall be installed centered in the upper section

of the side compartment header above the L1/R1, L3/R3, and L7/R7 compartments.

In addition to the NFPA warning light package, there shall be six (6) Whelen ION Series red LED lights with clear lenses installed three (3) each side. The lights shall be installed centered under each L1/R1, L3/R3 and L6/R6 compartments on the lower body sides. The lights shall be recess cut into the rub rail mounted to the body tube.

REAR DIRECTIONAL LIGHT BAR

There shall be eight (8) rear directional lights furnished and mounted on the rear of the apparatus integrated to the rear face of the body above the rear center compartment. The lights shall be Whelen ION LED amber lights with clear lenses and chrome bezels and mounted equally spaced, four (4) lights on each end cap.

The lights shall be controlled by a Whelen TACTLD1 control head mounted in a Fire Dept approved location.

REAR VIEW CAMERA SYSTEM

A chassis supplied camera shall be surface mounted on the center rear of the apparatus body for maximum viewing capability. A protective shroud shall be installed over the system to protect against damage. The cable will be encased in flexible conduit that has no 90 degree elbows.

12 VOLT SCENE LIGHTS

There shall be a Whelen model #M6ZC 12 volt gradient scene light with chrome bezel provided and installed with the apparatus as specified. There shall be a total quantity of two (2).

The scene lights shall be located below the upper zone warning lights on the rear of the body, one (1) each side.

The scene lights shall be activated by button/switch through the display/dash and when transmission placed in reverse. The lights will auto-off when the apparatus is placed in drive if they are left on.

12 VOLT PEDESTAL MOUNTED SCENE LIGHTS

There shall be a Whelen Pioneer model #PFP2/PBAPEDD, pedestal mounted dual lamp, 12volt, LED flood light provided and installed as specified below. There shall be a total quantity of four (4)

The scene lights shall be located on the side of the body, two (2) on each side, one (1) at the front (above the front of L1/R1) and one (1) at the above the front corner of L5/R5) of the catwalks.

The scene lights will be individually switched in the L1 compartment with labeled momentary rocker switches and by a button/switch in the display/dash.

HARRISON HYDRAULIC 10,000 WATT GENERATOR

The generator shall be one (1) Harrison MAS Hydraulic Driven Generator rated at 10,000 watts, 82/84 amps, 120/240 VAC, 60Hz, 1-phase.

The generator shall be designed and assembled by a company with no less than 20 years experience in the manufacture of hydraulic driven generators.

The generator components shall be housed in a structural steel frame, which affords protection to the components and provides a unitized mounting module.

The generator shall have top access to the oil filter, oil fill tube and electrical interface box.

The hydraulic oil reservoir shall include an oil level sight gauge visible from three sides; an oil temperature gauge; an oil fill cap; an oil filter and an internal venturi boost unit to provide positive pressure to the pump suction port.

The hydraulic oil reservoir shall be shipped attached to the structural steel frame. The hydraulic oil reservoir shall have an option to be remote mounted if required.

The generator shall have a cover consisting of NFPA approved diamond tread plate.

A meter package that provides the frequency, voltage and amperage of each leg shall be provided.

The generator shall not utilize electronic controls or a multiplex system to control the frequency.
The generator shall include a bypass solenoid to remotely turn the generator on/off with a 12 VDC signal.

The generator shall be a commercial type with a heavy-duty bearing and of brushless design to ensure low maintenance. No brushes or slip rings shall be allowed.

The generator and motor shall be close coupled and aligned using a Morse taper with a through bolt to secure the motor to the generator. No two (2) bearing generators shall be permitted.

The system shall be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed.

The generator shall be able to be used while vehicle is either stationary or in motion.
The generator shall provide an option for a self-sealing air intake to prevent recirculation of exhaust air.

The generator shall provide an option for a vertical exhaust fan in addition to the air intake fan. Single fan systems shall not be allowed.

The generator shall provide a dedicated air intake duct for the alternator and a dedicated air intake duct for the heat exchanger. Both air intake ducts shall be located on the same side of the generator.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. Gear motors shall not be allowed.

The hydraulic pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands. Use of electronics to control the flow shall not be allowed.

The system shall be capable of normal operations using a commonly available premium hydraulic oil; Mobile DTE series or equivalent. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system shall be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

The generator shall be tested at the full nameplate rated load prior to shipping and the test report shall be included. The test report will document the generator's performance at various loads from no load to full load to ensure reliable power delivery at those loads.

UL TESTING 110/220-VOLT & GENERATOR

The apparatus electrical and generator system shall be tested and UL certified.

HOT SHIFT PTO

A 'hot' shift shall be added to the hydraulic generator installation.

The PTO shall remain 'engaged' to keep fluid circulating through the system. A guarded switch shall be located on the cab dash or other operator accessible area in the cab. The switch shall be used to disconnect the PTO from the transmission in the event of hydraulic failure (broken hose, etc) during operation. The switch shall be labeled "GENERATOR EMERGENCY STOP".

A second switch with an indicator light shall be provided to excite the generator. The switch shall be labeled "GENERATOR EXCITE". The generator excite application shall be activated by a button/switch in the display/dash and a labeled momentary rocker switch located in the L1 compartment.

LOW HYDRAULIC FLUID DISPLAY

There shall be a low level visual and audible warning alarm located next to the FROG, indicating the hydraulic fluid is low.

GENERATOR INSTALLED

The generator shall be installed on top of the apparatus body in a Fire Dept approved location.

GENERATOR DISPLAY

A FROG (Frequency Regulation of Generator) generator display kit shall be installed to monitor a 50/60 Hz, generator.

The kit shall include:
(1) Display module.
(1) Voltage transformer.
(2) Current transformers and cables.

The display module shall consolidate five (5) generator monitoring instruments into one device. The display case shall be waterproof and have dimensions not to exceed 4 1/4" high by 4 1/4" wide by 3 1/4" deep.

The following continuous displays shall be provided with super bright LED digits more than 1/2" high:
Generator frequency in hertz
Line 1 current in ampere
Line 2 current in amperes
Generator voltage in volts

The program shall support the accumulation of elapsed generator hours and the monitoring of hydraulic

oil temperature. Generator hours and oil temperature shall be displayed at the push of a button. Audible warning alarm outputs are provided for generator overload, over/under voltage fluctuations, and high oil temperature.

The display shall be installed flush mounted on a custom fabricated angled mounting bracket, installed in the L-1 compartment.

LOAD CENTER

An electrical load center shall be provided and installed in a protected environment on the apparatus. The load center shall have provisions for up to eight (8) labeled 20 amp manual reset type circuit breakers. There shall be an electrical load center provided and installed in a protected environment.

The load center shall be recessed and mounted to the upper portion of the forward wall in the L1 compartment and shall be located as “best fit” to avoid interference and maintain functionality. Any exposed wiring shall be contained within conduit to ensure safety. The cutout shall be trimmed with trim-lock for a pleasing appearance.

ELECTRIC CORD REEL

Three (3) Hannay model #ECR-1616-17-18 series electric rewind cord reel(s) shall be installed on the apparatus as specified.

There shall be a extended roller assembly with lift bar shall be provided and installed to guide the cord on and off of the spool to prevent chafing on the body or opening. The lift bar will be on the left and right side reels only with the center reel mounted with the rollers facing straight down. There shall also be a cord stop supplied. The reel shall come equipped with 200 feet of yellow 10-3 electrical cord.

A weather resistant push button switch to activate the rewind shall be located next to the reel. The switch shall be labeled “CORD REEL”. There will be two (2) rewind buttons on each forward wall; one for that sides reel and one for the center reel.

The cord shall be hardwired to a Circle D remote power distribution box with (4) four NEMA Fire power single receptacles. The distribution box shall be stored in a mounting bracket when not in use. The box shall be equipped with a light to indicate when distribution box is energized.

The distribution box shall be equipped with the following receptacles:
Position 1: Fire Power
Position 2: Fire Power
Position 3: Fire Power
Position 4: Fire Power

The mounting bracket will be located at the final inspection.
- Three (3) located in transverse L1/R1 compartment with one reel to each side and one centered.

GENERAL INFORMATION

The aerial ladder/platform assembly shall be a three (3) section telescoping aluminum ladder, platform, pre-piped waterway, turntable, torque box and outriggers.

INTENT OF AERIAL SPECIFICATIONS

The intent of these specifications is to describe a telescoping elevating ladder. It shall consist of the true ladder type. It will consist of a steel 1000-pound capacity platform, three (3) aluminum ladder sections, a steel turntable, torque box and four outriggers. The rated vertical height of the unit shall be 100' and the rated horizontal reach shall be 94'.

It is the intent of the purchaser that the device must meet all the requirements of the National Fire Protection Association's (NFPA) 1901 standard, 2009 edition. It is also the intent of the purchaser to secure an apparatus that will be manufactured in the U.S.A.

It is not the intent of the purchaser to deviate from this requirement; therefore, platforms attached to booms, whether solid or lattice, or articulating arms will not be considered as meeting these specifications or the intent of these specifications.

DESIGN STANDARDS
The design criteria of the unit shall be to create a structure and support system that emphasizes safety, product reliability, and ease of operation. These criteria shall be:

1. All structure load supporting elements of the aerial ladder that are made of a ductile material, shall have a design stress of not more than 50 % of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the American National Standards Institute (ANSI) and the current National Fire Protection Association (NFPA) 1901 standard.
2. The aerial device shall be capable of sustaining a static load one and one-half times it's rated platform load capacity (live load), in every position in which the aerial device can be placed when the vehicle is on a firm and level surface.
3. The aerial device shall be capable of sustaining a static load one and one-third times it's rated platform load capacity (live load) in every position in which the aerial devices can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.
4. The hydraulic system shall be designed so that if a failure of any component or assembly within the system occurs, a single point failure of the entire system will not occur.
5. The aerial device shall be capable of operating with a rated platform load in either of two of the following conditions:
    A. Conditions of high wind up to 50 mph
    B. Conditions of icing, up to a coating of .25" over the entire aerial structure.

All of the design criteria must be supported by the following test data:
1. Strain gauge testing of the complete aerial device certified by Registered Professional Engineer.
2. Analysis of deflection data taken while the aerial device was under test load.
3. Hydraulic component operating and burst strength testing.

MATERIAL STANDARD
All structural materials used in the aerial shall be certified by the mill of the manufactured material. Materials that are not certified shall not be acceptable.

GENERAL APPARATUS DESCRIPTION

The unit shall be designed to conform fully to the "Aerial or Quint Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), shall include the general requirements as stated in Chapter 4 for Aerial or Quint Apparatus.

AERIAL PLATFORM MOUNTING

The elevating platform turntable will be rear mounted.

WELDMENT FIXTURES

To ensure exact tolerances between parts and part interchangeability, all weldments shall be manufactured in fixtures. To further insure weld integrity in all weldments, all ladder fixtures must be able to infinitely rotate about their main axis, to position the weldments in the number 1 flat welding position resulting in maximum weld penetration in the welded material for both the tack and final weld process of the ladder.

HEIGHT AND REACH

The height of the unit shall be a minimum of 100' as measured by NFPA-1901 requirements, which states, "The rated vertical height of the elevating platform assembly will be measured in a vertical plane from the top surface of the platform handrail to the ground, with the platform raised to its position of maximum elevation." The vendor will state the height of the unit as measured by NFPA-1901 standards.

The horizontal reach of the unit shall be a minimum of 94' as measured by NFPA-1901 requirements, which states, "The rated horizontal reach of the elevating platform shall be measured in a horizontal plane from the centerline of the turntable rotation to the outer edge of the platform handrail, with the elevating platform extended to its maximum horizontal reach." The vendor shall state the height of the unit as measured by NFPA-1901 standards.

AMBER CEILING BEACON

The chassis supplied amber Whelen OS LED light shall be located on the cab's ceiling. This light shall be a flashing self-contained light that shall be activated when the aerial is raised and the outriggers are deployed.

HYDRAULIC SYSTEM

The hydraulic system shall provide power to the entire aerial device as efficient as possible without the use of a hydraulic cooler.

A load sensing axial piston hydraulic pump shall be provided. The pump shall be capable of operating under any rated ladder tip load condition and aerial device position at normal engine idle or governor controlled fast idle. The hydraulic pump shall be capable of generating sufficient flows to allow multiple aerial functions without significant loss of speed.

A hydraulic system relief valve as well as individual circuit relief valves shall be provided to prevent damage to any function or circuit. The relief valve shall have a relief spring to ensure proper function and product reliability.

POWER TAKE OFF (PTO)

The apparatus shall be equipped with a power shift PTO driven by the chassis transmission. An indicator light shall be located in the cab to show when the PTO is engaged.

The PTO shall only engage with the parking brake applied and the transmission in neutral or drive if the

fire pump is engaged. The PTO shall be a heavy-duty pressure lubricated and cooled unit for extended operations.

A master "Ladder Power" switch shall be provided for engagement of all ladder hydraulic functions and 12-volt power. The emergency pump circuit shall be controlled separately.

AERIAL HOURMETER

An aerial hourmeter shall be installed in the cab. The hourmeter shall be wired to the aerial PTO circuit to record hours of PTO operation for the aerial device. The hourmeter shall aid in scheduling preventative maintenance as outlined in the operator's manual.

There shall be an additional Hobbs Hour meter installed at the turntable control console. This hour meter shall read aerial operation (hours with aerial out of cradle).

ENGINE HIGH IDLE ACTUATOR

The high idle actuator shall be used to raise the engine RPM to a preset level for proper aerial operation. The high idle switches shall be located in the chassis cab, at the outrigger control stations and the aerial control station or stations.

For the safety of personnel and equipment, the high idle system shall not activate unless the transmission is in neutral.

HYDRAULIC OIL RESERVOIR

A hydraulic oil reservoir shall be provided to supply the needs of the hydraulic system. The tank shall be constructed from minimum 10 gauge steel, which shall be welded at all interior and exterior seams.

A minimum 2" gated suction line shall be provided between the oil reservoir and the primary hydraulic pump. The tank fill shall be provided with a strainer screen and vent cap. There shall be a sight level gauge for checking fluid levels.

The tank shall be cleaned and free from all contaminants before adding any fluid.

HYDRAULIC SYSTEM FILTRATION

Outgoing and return line filtration shall be provided. The pressure and return filters shall be easily accessible for maintenance.

Outgoing filtration shall be in the form of a pressure line filter installed between the hydraulic pump and entrance to any system components. The filter shall have an absolute rating of ten (10) microns. The pressure filter shall have a bypass circuit protected by a 90-psi check valve, which shall be installed around the pressure filter. The pressure line filter shall be required even if a suction line filter is provided in the reservoir due to the suction line filter's inability to trap contaminates entering the system.

A filter condition indicator shall be provided.

The return line flow shall be filtered by means of a return line filter. This filter shall have an absolute rating of ten (10) microns.

EMERGENCY HYDRAULIC PUMP SYSTEM

In the event of failure of the main hydraulic pump or vehicle engine, the unit shall be equipped with two (2) emergency hydraulic pumps.

Both pumps shall be plumbed into the hydraulic system and be electrically driven from the chassis batteries. The emergency pumps shall be capable of limited functions of the ladder and outriggers to stow the unit. The pumps shall be controlled from the right and left outrigger, and the turntable control stations with spring loaded momentary contact switches.

The emergency pumps shall have a separate hydraulic oil supply line, attached directly to the hydraulic oil reservoir. A shutoff valve shall be provided and a check valve shall be incorporated on the pressure side of the pumps.

HYDRAULIC HOSE, TUBING AND FITTINGS

All hydraulic steel tubing, hydraulic rubber covered wire-braided hoses, and hydraulic fittings/adapters shall have a minimum burst pressure rating of four times the operating pressure. Hoses and tubing shall be properly sized to minimize heat buildup during extended periods of operation. Hoses and tubing shall be properly sized to minimize flow restrictions.

All hydraulic hose shall have a tube and cover constructed of Nitrile elastomers and shall have braided/spiral wire reinforcement capable of maintaining a 4:1 safety factor in all areas of the hydraulic system. The hose shall meet the appropriate SAE performance specifications: 100 R2 or 100R12.

The hydraulic fittings shall utilize o-ring face seal technology to minimize fluid leakage and improve serviceability.

OUTRIGGER/AERIAL INTERLOCK

The aerial hydraulic system shall include an interlock feature that will prevent the accidental operation of the outriggers during aerial operation. This interlock shall also prevent accidental operation of the aerial device prior to the outriggers being properly deployed.

In the event of electrical failure, the operator shall be able to override the hydraulic system to operate the ladder or outriggers for continuous, uninterrupted operation.

LIFT, EXTENSION AND ROTATION HYDRAULIC CONTROL VALVE

The lift, extension, and rotation systems shall be controlled by a proportional, load sensing directional control valve. This valve shall be of a modular construction that simplifies troubleshooting, minimizes downtime, and simplifies field service. The main control valve shall be positioned at the turntable control console for direct manual control of each aerial function.

TORQUE BOX

A tube torque box sub-frame shall be provided to transfer all aerial loads and torque into the four (4) outriggers, thus preventing the loads from being transferred through the chassis. The torque box shall consist of four (4) outrigger housing weldments, forming a single structural weldment for aerial load distribution among the outriggers.

The torque box shall be bolted to the chassis frame with .75” SAE grade 8 bolts.

Paint color to be approved by Fire Dept.

OUTRIGGER SYSTEM HYDRAULIC CONTROL VALVES

A directional control valve that is designed for parallel hydraulic circuit operations shall control the outrigger cylinder system. This valve shall be modular in design so that individual sections can be replaced in the field, rather than complete valve assemblies, thus reducing maintenance costs. Each valve shall be equipped with a heavy-duty electric solenoid for electric control of the outrigger from the remote operator's station.

OUTRIGGER CONTROL MODULE

An electronic outrigger control module shall be provided at the rear of the vehicle. The outrigger control module shall be enclosed in a recessed compartment in the upper left area of the rear body panel. The control module shall enable the operator to see the outrigger he is operating. Body designs that block the view of the outriggers from the control station shall not be acceptable.

Each outrigger control function shall be operated independently, so that the vehicle may be set up in restricted areas or on uneven terrain.

The outrigger control module shall incorporate the following:
-Outrigger beam and outrigger jack actuator controls
-Outrigger beam deployed indicator lights
-Outrigger jack deployed indicator lights
-Fast idle switch
-Emergency pump control switch
-Warning decals

The outrigger control module shall be connected to the recessed compartment at the rear of the apparatus by a twenty foot (20') coiled control cable. The control cable shall include a multi-pin connector at the rear of the apparatus to enable easy replacement.

FRONT OUTRIGGERS

Two (2) “H” style outriggers will be provided. The extension of the horizontal outrigger beams shall provide an 18’ outrigger stance. The horizontal outrigger beam shall be fabricated from high strength steel plates with an RBM of 545,000 ft-lb. For ease of maintenance, the outrigger extension cylinders shall be equipped with end connections, which do not require removal of body panels to remove pins or the extension cylinders.

REAR OUTRIGGERS

Two (2) **"**H**"** style out and down rear outriggers shall be mounted underneath the chassis frame to allow more ground ladder storage above the frame. The outriggers shall provide an 18’ stance.
The outriggers shall provide 10 degrees of leveling for operations in hilly terrain.

The jack cylinders shall be equipped with integral (on the cylinder) holding valves, which shall hold the jack cylinder in either the stowed position or the deployed position should a hydraulic line be severed at any point within the hydraulic system. Each jack cylinder shall also have a thermal relief system that shall prevent the cylinder fluid pressure from rising due to fluid temperature increase.

For ease of maintenance, the outer jack tube shall be designed so that the cylinder can be removed

from the top. Designs that require the outrigger beams to be removed or the jack cylinder positioned over a pit for jack cylinder removal, shall not be acceptable.

OUTRIGGER PADS

A permanently attached self-centering steel outrigger pad, shall be provided on each outrigger. The pad shall swivel and require no adjustment during outrigger set-up.

The outrigger pad shall be attached without the use of a bearing type swivel due to maintenance required on this design.

AUXILIARY OUTRIGGER GROUND PADS

Four (4) auxiliary outrigger ground pads shall be provided for additional load distribution. Each ground pad shall be fabricated of Composite Plastic. Each ground pad shall be equipped with a handle for easy use.

OUTRIGGER/AERIAL INTERLOCK SYSTEM

An interlock system shall be provided between the outriggers and aerial device that prevents the operation of the aerial until the operator places all jacks in the load-supporting configuration. All jacks shall be equipped with a ground force sensitive switch that closes only when the jack is firmly in contact with the ground.

Until all the switches close, electrical and hydraulic power shall not be transmitted to the turntable, hence preventing aerial operation. Indicator lights shall be provided on the outrigger control panel to indicate that the outrigger foot is in firm contact with the ground and in a load supporting position.

OUTRIGGER DEPLOYMENT WARNING ALARM

An outrigger deployment-warning device shall be provided to warn personnel in the vicinity of the apparatus that the outriggers are in motion. Whenever an outrigger control handle is utilized, the device shall produce a pulsing tone. When the outrigger control handle is released to its neutral position, the signal shall cease.

OUTRIGGER LIGHTING AND REFLECTIVE STRIPING

Each outrigger shall be equipped with the following light and reflective striping package:
Reflective Chevron striping shall be applied on both sides of the horizontal outrigger beams. White reflective striping shall be provided on the vertical jack towers.

There shall be an LED ground illumination light located at each outrigger or downrigger location to illuminate the footpad area.

One (1) double faced red flashing LED light shall be installed on the inside vertical jack tower of each outrigger.

Both the foot pad illumination lights and the flashing outrigger lights shall be activated by the aerial power switch.

TURNTABLE/TURNTABLE DECK

The turntable shall be a fabricated steel weldment designed for the rotation and elevation of the ladder sections and platform. It shall consist of the following:

A steel bearing plate and matching top plate shall be machined to insure proper fit to the rotation bearing. Manufactures that do not mill both bearing surfaces shall not be acceptable.

Embossed aluminum diamond plate or steel deck shall cover the entire turntable frame, providing a walking surface.

An embossed aluminum diamond plate access step shall be mounted at heel of the ladder.

All handrails shall be a minimum of 42” high. For ease of grip, the handrail shall be manufactured from knurled stainless steel with reinforced triangular mounting feet.

Turntables with the drive motor or breathing air bottles mounted in any walking areas (front or rear) of the turntable shall not be acceptable.

A full size turntable deck shall be provided to maximize the safe work area around the control console and to allow unimpeded access to and from the aerial ladder and the ground.

TURNTABLE ACCESS SAFETY BAR

Two (2) Fire Research ManSaver model MSA110-A22 turntable safety bars shall be installed. The safety bars shall open either upward or inward and be spring loaded to automatically return to the horizontal closed position. The safety bar assembly shall be made of aluminum and stainless steel with foam padding and a bright yellow cover on the bar. The cover shall be waterproof, mildew resistant, and made of reinforced rip stop vinyl.

CRADLE ALIGNMENT INDICATOR ARROWS

Stainless steel arrows shall be installed on the turntable surface in view of the operator when standing at the turntable control station. The arrows will assist the operator in indicating the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be overlaid with white Scotchlite material and suitably illuminated for nighttime operation.

HYDRAULIC, ELECTRIC AND WATER SWIVEL

Hydraulic power to the turntable hydraulic circuits shall be provided through a three port, high pressure, hydraulic swivel that permits 360-degrees of continuous turntable rotation.

A collector ring assembly shall provide electrical power to the turntable electric circuits. The collector rings shall be used for electrical ground, ladder control functions, and a 110-volt A. C. system during 360-degrees of continuous turntable rotation. The collector ring assembly shall have sufficient rings to provide power, ground, control functions and four spare circuits.

Water shall be transferred to the aerial waterway by means of a five (5) inch water swivel enabling 360-degree continuous rotation of the turntable.

AERIAL TRAVEL SUPPORT

A heavy-duty rest shall be provided to support the aerial in the travel position. The base of the travel support shall include a rubber isolator and spring mounted pivoting arrangement to cushion loads on ladder rest. Stainless steel bedding plates shall be attached to the aerial base section to protect the aerial when the unit is in the travel position.

ELEVATION SYSTEM

A ladder lift cylinder cradle arrangement shall be provided to raise and lower the ladder. The lift cradle shall provide for machined pin connections between the lift cylinders, turntable and the ladder. The lift cradle system shall incorporate torsional bracing for the ladder, readily accessible cylinder removal and eliminate side loads to the ladder side trusses.

Two (2) double acting lift cylinders shall be attached between the turntable and the base section creating an effective lifting geometry resulting in lower hydraulic operating pressures and improved load distribution on the base ladder section. The cylinders shall function only to elevate the aerial device, not as a structural member to stabilize the ladder sideways. The lift cylinder trunnion shall be attached to the ladder lift cradle and the rod shall attach to the turntable utilizing self-aligning swivel bearings which prevent side loading on the lift cylinders resulting in longer cylinder seal life. They shall provide smooth precise elevation from -10 degrees below horizontal to +80 degrees above horizontal. The lift cylinders shall have a 8" internal bore, a 6" diameter rod.

The lift cylinders shall be equipped with integral (on the cylinder) holding valves, which prevent the ladder from lowering should a hydraulic line be ruptured at any point within the hydraulic system. They shall also have a manifold line with velocity fuses between the cylinders to prevent uneven cylinder lift.

LADDER INTERLOCK SYSTEM

A limit switch at the aerial travel support shall be provided to prevent operation of the outriggers once the aerial device has been elevated from the nested position.

EXTENSION/RETRACTION SYSTEM

A dual system of hydraulic cylinders and cables shall provide full power operation of the extension and retraction modes. Each system shall be capable of supporting the ladder in the event of failure of one of the systems. The cables shall be used to extend and retract the mid section and fly section.

The cable system shall utilize two extension cables and retraction cables on each section. The cables shall be sized to have a safety factor based on a breaking strength of 8:1 and a ratio of sheave diameter to cable diameter of 12 to 1.

A stroke multiplier cable system shall be provided because it reduces cylinder weight, shifts the ladder center of gravity toward the heel pin during extension, improves overall vehicle stability and does not subject the cylinder to buckling forces caused by normal deflection and compression loads.

EXTENSION INDICATOR

The base section handrails shall be provided with black Scotch-Lite reflective striping and numbers to indicate the extension of the aerial device. The stripes and numbers shall be spaced to indicate each 10 feet of aerial extension beyond the fully retracted position. An additional stripe shall be provided

between the numbered stripes to indicate each 5 feet of aerial extension.

LADDER SLIDE MECHANISM

Wear pads shall be provided on each ladder section.. They shall provide the maximum friction free extension and retraction for the ladder. Replacement of pads shall be achieved without the removal or disassembly of any of the ladder sections.

LADDER CABLE AND HOSE ROUTING SYSTEM

The hydraulic and electrical lines to the platform shall be enclosed and protected from the turntable to the platform. The lines shall be routed and horizontally guided between the ladder section side rails to minimize obstruction to climbing areas.

Ladder designs in which electrical or hydraulic lines are routed over the rungs are not acceptable due to the reduction in climbing area.

ROTATION SYSTEM

A minimum 50.00" external tooth monorace bearing shall be provided for smooth 360-degree continuous rotation and sufficient strength. The inner and outer race of the bearing shall be bolted to the open base and turntable using .750" diameter grade 8 bolts, and with high strength washers. All bearing bolts shall be accessible from the upper side of the turntable for ease of access to torque and inspect the bolts.

Both upper and lower bearing surfaces shall be milled to ensure a true mounting surface for the rotation bearing. Units that weld the bearing to their mounting plates shall not be acceptable due to the cost and down time involved in replacing a damaged or defective bearing.

A dual hydraulic driven planetary swing drive system shall provide smooth and precise rotation. Single drives will be considered and approved by the Fire Dept. A spring applied, hydraulically released, disc type brake shall be furnished on each gearbox to provide positive braking of the turntable assembly against reactionary forces such as water and gravity. The planetary drives shall be positioned on the turntable so they shall not obstruct any walking area or stepping surface on the turntable deck. The swing drive mounting shall incorporate an adjustable mount to provide for minimal gear backlash in the drive system.

ROTATION SAFETY SYSTEM

The rotation safety system shall be designed to prevent the operator who has primary operational responsibility from rotating the aerial device into an overturning mode. This system senses outrigger and outrigger jack positioning in conjunction with the aerial device movement.

If any outrigger beam is not fully extended, an indicator light on the control console shall remain illuminated. The aerial device operator will then be required to engage an override switch in order to lift the aerial device from the travel rest.

If the aerial device operator attempts to rotate the aerial device (in excess of manufacturer set parameter beyond vehicle center) towards the side of the vehicle in which the outriggers are not fully deployed, the system shall sense this fault and prevent the aerial from rotating further in said direction. At this point only rotation to the fully deployed outrigger side shall be allowed.

CAB/BODY AVOIDANCE SYSTEM

A fully profiled cab/body avoidance system shall be integrated into the rotation and ladder lower functions. The system shall serve to alert the aerial device operator of an impending collision with the vehicle cab or other portion of the vehicle body within 360 degrees of rotation when operating at lower angles of elevation. The system shall alert the operator with an audible alarm and illuminate a flashing indicator light at the aerial control station(s). The alarm(s) shall stay active so long as the ladder remains in the potential contact zone area and the dead man foot switch is depressed. Should the operator ignore these warnings, the system shall override the appropriate operator input command(s) and automatically decelerate the rotation and ladder lower functions to a complete stop prior to ladder contact with the vehicle. A momentary contact closure shall be provided to allow the system to be overridden. The system shall allow for free rotation and elevation away from the contact zone. The system shall also be disabled when the ladder is aligned with the docking cradle.

AERIAL AUTO STOW

The aerial device shall be equipped with an automatic stow feature which will return the aerial ladder to the nested position for road travel. The system shall be actuated by a guarded momentary switch at the aerial control station(s) or alternative method. If utilized the switch shall be labeled as "AERIAL STOW". The auto stow shall only operate when the ladder is fully retracted,and within parameters set by manufacturer.

LADDER SECTION CONSTRUCTION

The elevating platform shall consist of three (3) aluminum ladder sections referred to as the base section, mid section, and fly section.

The design and construction criteria for these ladder sections shall be:

1. Fabricated using high strength metal, welded together to form a structural unit.
2. Welded by welders certified in accordance with the American Welding Society Standard specifications.
3. Constructed in an infinitely rotating assembly fixture to ensure uniformity and interchangeability.
4. K-braced at each rung to minimize side deflection of the ladder.
5. Constructed of a minimum 1-1/4" in diameter steel rungs, spaced at a maximum 14" centers and be covered with deeply serrated, replaceable rubber sheaths held in place with contact cement and metal clips for ease of replacement.
6. All rungs, K-braces, and diagonals shall be positioned so that they are continuously welded to the ladder section in the number one welding position.

Ladder designs that do not utilize rubber covers shall not be acceptable due the high cost and difficulty to replace the anti-slip surface and the inability to provide a safe surface during icing conditions.

Ladder handrails and diagonal material shall be constructed from square or rectangular tubing, to provide a larger welding surface were the materials are attached to each other. Use of round material is not desired due to the reduced amounts of weld.

LADDER SECTION DIMENSIONS

All vendors shall state in the space provided below their dimensions on the unit proposed. Dimensions proposed must equal or exceed those specified.

	Handrail Dimensions	
	H	W
Base Section Vendor	Per manufacturer	
Mid-Section Vendor	Per manufacturer	
Fly Section Vendor	Per manufacturer	

MINIMUM OVERLAP SURFACES BETWEEN SECTIONS	
Base to Mid-Section	90”
Mid to Fly Section	90”

PLATFORM SPECIFICATIONS

The aerial platform shall be constructed of high strength aluminum tubing, angles, and formed channels. The handrails, floor and support structure shall be assembled to enable each component to be unbolted from each other for ease of replacement should a component of the platform be damaged.

SUPPORT STRUCTURE FRAMEWORK

The support structure framework of the platform shall be a aluminum weldment consisting of formed channel and tubing for strength and rigidity. The slave leveling cylinders shall attach to this structure from the ladder fly section, thus keeping the platform level at all times.

Heavy-duty rubber bumpers shall be installed under the platform to prevent damage to the platform when the unit is placed on the ground or the edge of a building. The bumpers shall be bolted directly to the structural framework of the platform.

PLATFORM COVERINGS

For maximum safety, rigid protective shields shall protect the operator in the platform. The shields shall be provided on the front and sides of the platform, on each of the outside surfaces of the corner gates and the entire underside of the platform.

The front heat shield shall be provided with a cutout for the adjustment of the front facing LED light located between the monitors.

FLOOR

The floor of the platform shall have a total internal area of a minimum of19.00 square feet with an 8” external step for a combined total area of over a minimum 25.00 square feet. The floor shall be an open-type non-slip non-grating, thus preventing the accumulation of water and or ice on the platform floor.

HANDRAIL STRUCTURE

In compliance with the NFPA Standard, a forty-two inch (42”) high continuous, unbroken handrail shall be provided on all four sides of the platform to prevent personnel from falling from the platform. The railing shall be constructed so that no opening below it is greater than 24”. A kick plate shall be provided around the entire inside perimeter of the platform floor.

Each front corner of the platform shall be equipped with an inward/outward swinging spring loaded gate assembly for access to the platform. The gate openings shall have a minimum width of 18". Handrail extensions shall be provided off the rear of the platform to bridge the gap between the platform and the ladder to a safe transition to/from the platform when the ladder is raised to high elevations. The handrails shall be designed to pivot close to the fly section handrails.

PLATFORM/ LADDER ACCESS GATE

A gate shall be provided between the platform and the fly ladder section. The gate shall be spring-loaded and shall automatically return to the closed position at all times. The gate shall push upward and or inward to the platform from the fly section. The gate shall not move if pushed against from the inside the platform.

PLATFORM LEVELING SYSTEM

A platform leveling system shall be provided and so designed that the platform, together with its rated payload, can be supported and maintained level in relation to the turntable, regardless of the elevation of the ladder.

Platform leveling shall be accomplished by hydraulic circuitry that is independent from the main hydraulic system with an interconnecting control valve.

The platform leveling shall be accomplished by the following two (2) systems working together.

1. Dual master/slave hydraulic cylinders- The leveling of the platform shall feature a dual master/slave system with each capable of maintaining the platform level. Two (2) 3" bore master cylinders shall be mounted between the turntable and the ladder base section; and two (2) bore slave cylinders shall be mounted between the ladder fly section and the platform. Master/Slave cylinders shall be equipped with spherical swivel bushings on both ends to extend cylinder seal life, provide proper alignment between the ladder and platform. As the platform is raised and lowered, hydraulic fluid shall be transferred from the master cylinder to the slave cylinders, thus maintaining the platform level. The slave cylinder shall be mounted outside of the platform for maximum platform space utilization.
2. Auto-leveling system- An automatic level-sensing inclinometer, located in the platform shall be provided to ensure that the platform is always level with respect to the horizon.
    A. The leveling system shall be designed that with the platform raised to its maximum elevation, the platform slave cylinders shall be fully retracted thus making tipping of the platform impossible should a hydraulic failure occur.
    B. Leveling cylinders shall have hydraulic holding valves to prevent the platform from tipping should the hydraulic lines be severed.
    C. The slave cylinders shall be mounted outside the platform for maximum utilization of space and for safety of personnel from moving cylinders.
    D. Manual movement override controls to be located inside pedestal.

PLATFORM MOUNTING

The platform shall suspend from the tip of the fly section with the aluminum platform support weldment pinned to the end of the fly section.

PLATFORM STORAGE COMPARTMENTS

A large aluminum treadplate storage compartment shall be provided and installed at each rear exterior corner of the aerial platform. The compartments shall have capacity for hose, forcible entrance tools

and other miscellaneous equipment.

Access to the top and front of the compartments shall be through hinged aluminum diamond plate doors complete with latches. The bottom of the compartments shall have holes for drainage.

PLATFORM WATER SYSTEM

The aerial waterway system shall be capable of being supplied externally from an inlet located at the rear of the apparatus.

The piping from the rear aerial inlet to the turntable swivel shall be 5" aluminum pipe**.** A 5" water swivel shall be located in the riser pipe from the tee permitting 360-degree continuous rotation of the ladder.

A 5" swivel piped waterway connection between the ladder waterway and the turntable rotation swivel permitting water tower operations through full aerial elevation range.

A 1-1/2" relief valve preset at 250 psi shall be located beneath the turntable to protect the water system from excessive pressures.

AERIAL WATERWAY FLOWMETER

The apparatus shall be equipped with a two (2) Class 1 Flow minder or equivalent model on the turntable and platform control console to give the aerial operator an indication of actual volume of water (in gallons per minute) being discharged through the line. It shall also be capable of showing total flow at the touch of a button.

Each Flow minder system shall consist of:
1. A digital display shall be wired to the flow transmitter to show waterway discharge flow.
2. A flow transmitter mounted in the discharge line piping between the rear aerial inlet and the platform discharge manifold. The transmitter shall consist of a weather resistant black composite housing with a stainless steel, durable paddle wheel. The only part inserted into the water flow path shall be the paddle wheel.

The flowmeter shall be checked and calibrated prior to delivery of the apparatus.

An anodized aluminum telescopic waterway shall be mounted beneath the center of the aerial ladder. The waterway shall have a 5.0" base section tube, 4.5" mid section tube and 4.0" fly section tube.

An automatic drain shall be provided in aerial waterway to automatically drain the system for freezing conditions. This valve shall also act as a vacuum relief valve for the waterway when extending the aerial device with the discharges in the closed position. A 1-1/2" drain valve shall be installed and operated from the side of the apparatus.

PLATFORM WATER SYSTEM (DUAL MONITORS)

A 5" water swivel located behind the platform will connect from base waterway to the platform waterway. The water swivel will permit full operation at any elevation of the aerial device. Two (2) 4" pipes will be provided to transfer water from the swivel to the platform monitors. The platform waterway pipes will be formed tubing to reduce friction loss in the waterway, designs that include cut and welded pipes will not be acceptable. All platform waterway piping will be completely removable for service or replacement. Platform designs in which the waterway is welded or utilized for the structural integrity of the platform will not be acceptable.

There will be two (2) Task Force Tips Valve-Under-Monitors (VUM) with 22.5 degree elbow will be supplied with one (1) installed under each monitor. All monitor controls will be installed below the top rail of the platform.

A 100 GPM shower nozzle shall be located beneath the platform to provide additonal heat protection for platform personnel. A direct linkage control shall be provided inside the platform.

ELECTRICALLY CONTROLLED MONITOR

Task Force Tips Monsoon electrically controlled monitor shall be provided.

The monitor shall have the following capabilities: full horizontal rotation with 360 degree travel, 135 degrees of vertical travel with field changeable stops at 90 degrees above horizontal and 45 degrees below horizontal, field changeable rotation stops shall be provided at 45, 90 and 135 degrees left and right of center, flow capability of 2000 GPM, maximum operating pressure of 200 PSI.

For resistance to corrosion the monitor shall be constructed from hard coat anodized aluminum with a silver powder coat interior and exterior finish. A threaded port for an optional pressure gauge shall be provided.

Task Force Tips Master Stream 2000 automatic nozzle with electrically operated pattern control shall be provided. The nozzle design shall allow for straight stream through dense wide fog patterns.

The electric drive unit shall be enclosed in a waterproof cast aluminum housing and include a manual override device in the event the power source fails. The unit shall be 12 volt and require no more than a 3 amp power draw.

For corrosion resistance and durability the nozzle and actuator shall be constructed from hard coat anodized aluminum alloy, include a protective rubber bumper with fog teeth, laser engraved serial number, and reflective labeling.

The nozzle shall have a swivel rocker lug coupling and a flow range of 150-2000 GPM at 100 PSI.

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PLATFORM MOUNTED STACK TIPS

One (1) set of stacked tips shall be installed in the platform.

One (1) Task Force Tips YST-4NJ stacked tip set shall be provided with the aerial device. Tip set shall be provided with a 2-1/2" base with 2", 2-1/4", 2-1/2" & 2-3/4" orifices. The stacked tips shall be installed on the shaper tube when not in use.

PLATFORM MOUNTED SHAPER TUBE

One (1) shaper tube shall be installed in the platform.

One (1) Task Force Tips XF-SS5-NN "Stream Shaper" shall be provided with the aerial device. The shaper tube shall be provided with a 3-1/2" inlet, 2-1/2" outlet and shall be 5" long. A 3-1/2" screw type mounting plate shall be installed to hold the tips when not in use.

ELECTRIC VALVE UNDER MONITORS (VUM)

A Task Force Tips VUM, model # AKE122111D electrically controlled monitor valve shall be provided under the left side monitor. The valve shall be configured with a 4" ANSI 150 flange inlet and TFT Code RPM 22.5° male connection for a Task Force Tips monitor with TFT Code RPF female inlet. Port C1 shall have left hand elbow quarter turn ball valve with 2-1/2” NH male outlet installed. Ports C2, C3, and C4 shall have blind plugs installed.

A Task Force Tips VUM, model # AKE121113D electrically controlled monitor valve shall be provided under the right side monitor. The valve shall be configured with a 4" ANSI 150 flange inlet and TFT Code RPM 22.5° male connection for a Task Force Tips monitor with TFT Code RPF female inlet. Ports C1, C2, and C3 shall have blind plugs installed. Port C4 shall have right hand elbow quarter turn ball valve with 2-1/2” NH male outlet installed.

Each valve shall be controlled by a remote panel-mounted push-button switch with LED lights to indicate valve position and shall be included. The valve can also be controlled with an NFPA compliant slow-close knob which can be configured for left or right hand operation on the valve. A position indicator shall be provided on the valve to allow for quick visualization of the status of the valve in the open, closed or partial positions. The unit shall have a flow capability of up to 2000 GPM with friction loss no more than 6 psi. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a silver powder coat internal and external finish. The valve ball shall be stainless steel and have an automatic drain for draining waterway when valve is closed and unpressurized. Each unit shall have a unique serial number and be covered by a five-year warranty.

All 2-1/2” NH male discharges shall have a 2-1/2” NH female by 1-1/2” NH male thread reducer and a 1-1/2” NH female cap with lanyard.

LADDER CAPACITIES

The following ladder/platform load capacities shall be established with the truck level and the outriggers fully extended and lowered to relieve the chassis weight from the axles. Capacities are based upon 94' extension and 360 degree rotation.

LADDER/PLATFORM CAPACITIES IN POUNDS (MINIMUM)

(Uncharged Waterway)
Elevation in Degrees

SECTION	-10-19	20-39	40-59	60-75	76-80
Base	250	500	500	750	1000
Mid	---	---	500	500	500
Fly	---	---	---	500	500
Platform	1000	1000	1000	1000	1000

LADDER/PLATFORM CAPACITIES IN WATER TOWER OPERATION

Elevation in Degrees

SECTION	-10-19	20-39	40-59	60-75	76-80
Base	250	500	500	500	500
Mid	---	---	250	250	500
Fly	---	---	---	250	500
Platform	500	500	500	500	500

Due to the demand of firefighting situations, units that do not allow these aerial and water tower capacities shall not be acceptable.

WATER TOWER OPERATION (MINIMUM)

The following water tower capacities shall be based upon continuous 360 degree rotation and up to full extension.

The ladder/platform and water system shall be designed to permit the following total flows of a single monitor:

1. The water tower system shall be capable of flowing 1,500 gpm in all permitted ladder and nozzle positions.
2. The water tower system shall be capable of flowing 2,000 gpm in all ladder positions with the nozzle in the following positions: With ladder above 45 degree angle of elevation, nozzle range below 45 degree above or 45 degrees below horizontal. With the ladder below 45 degree angle of elevation, nozzle range shall be limited to horizontal or 45 degree below horizontal.

OPERATIONS ON GRADES

The aerial unit shall be capable of being leveled and operated, utilizing the permanently attached stabilizers, on a slope of up to a maximum 15 degrees. This shall be achieved without the need for additional level enhancing equipment such as cribbing.

AERIAL CONTROL STATIONS

There shall be two (2) control stations, one known as the platform control station and the other known as the turntable control station. All elevation, extension and rotation operational controls shall operate from both of these positions. These controls shall be arranged to permit the operator to regulate the speed of these operations within the safe limits as determined by the manufacturer. The control devices shall be grouped in an identical manner at both stations for similarity of operation and to meet NFPA-1901.

Platform load instruction plates shall be located at both control stations to indicate the recommended safe load ratings of the platform. The control devices shall be clearly marked and suitably lighted.

The controls shall be so designed to allow the turntable control station to override the platform controls even if the ladder is being operated by the platform controls.

TURNTABLE CONTROL STATION

The control station shall be located on the left side of the turntable, as the operator is facing the tip of the ladder (driver's side of the apparatus), in order to provide increased visibility of the ladder tip while operating the controls. The lower part of the console shall be angled away from the operator, to provide as much foot room as possible for the operator. The control console and lid shall be fabricated from aluminum diamond plate. The console lid shall be wired to the "Door Open" warning system (AMBER).

An access panel door shall be provided on the front of the console and an access door at the rear of the console to provide complete access to the electrical and hydraulic components mounted inside the console.

The console shall have LED illumination for night operations (One TecNiq, #E03-W000-1) or eqivalent and will have the following controls and indicators:
Three (3) electric\hydraulic ladder/platform control levers
Master electrical power switch with emergency shutdown capabilities
Rung alignment indicator light for ladder climbing operations
Cradle alignment indicator light
Engine fast idle control switch
Emergency pump power switch
Intercom controls inside console lid
Illuminated Bubble type angle indicator on base section near console
LED illuminated load chart on front of console (One TecNiq, #E03-W000-1)
Hinged aluminum diamond plate console cover over controls
Short Jack Indicator Lights
Outrigger Short Jack Override Switch (if needed)
Tracking Light Switch
Body Avoidance Override Switch with Warning Indicator (if needed)
Platform Monitor Control Switches
Aerial Auto Stow Switch (if needed)
Aerial Flowmeter
Aerial Hourmeter
Airminder Display

PLATFORM LADDER CONTROLS

Three (3) ladder directional controls shall be mounted on the platform control console. They shall control extend/retract, rotation, and elevation. These controllers are part of a microprocessor based CAN-Bus control system, which has the following features:

1. Soft start (ramp up) for smoother and safer starting of the platform.
2. Soft stop (ramp down) provide smoother and safer stopping of the platform.
3. Multiplex CAN-Bus signaling transmitted through two wires to reduce the chance of electrical failures since fewer wires and terminals shall be utilized. Additionally, voltage sensitivity is eliminated thus providing superior motion control.
4. "Ultra feathering operation" which allows precise placement of the platform in critical areas.

The platform control console shall be located in the front of the platform and shall be mounted on a slide rail which allows the operator to reposition the control console to the left or right side of the platform.

The following controls shall be located on the illuminated console:
-Extend/Retract Control Lever.
-Elevation Control Lever.
-Left/Right Control Lever.
-Fast Idle Control Switch.
-Rung Alignment Indicator.
-Panel Light.
-Illuminated Bubble Type Angle Indicator mounted on handrail of ladder.
-Cradle Alignment Indicator.
-Outrigger Short Set Override Switch with Indicator.(if needed)
-Aerial Auto Stow (if needed)
-Aerial Flowmeter
-Airminder Display

AERIAL PAINTING

Prior to any painting, all weldments such as the outrigger beams, torque box, turntable, shall be shot blasted, cleaned and inspected to insure the removal of any surface imperfections and to insure superior paint adhesion to the metal.

The entire painting system shall utilize a single manufacturer's paint for compatibility between primers and finished coats. All painting shall be done in atmosphere controlled spray booths. The weldments will then be primed with a Ditzler PPG zinc corrosive inhibitor and a Ditzler (PPG) Epoxy Primer. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the aerial unit shall be thoroughly cleaned, conforming to good painting practices.

Sign board paint:
The finished paint color shall be Ditzler (PPG) Durethane Polyurethane 926235 White.

Cradle and lift cylinder paint:
The finished paint color shall be PPG 926236 red enamel, allowing easy touch-up after extended use.

Aerial travel rest paint:

The finished paint color shall be PPG 9000 black enamel, allowing easy touch-up after extended use.

Platform handrail paint:
The finished paint color shall be PPG 926235 white enamel, allowing easy touch-up after extended use.

Platform substructure paint:
The finished paint color shall be PPG 926235 white enamel, allowing easy touch-up after extended use.

Outrigger beam paint:
The finished paint color shall be PPG 926236 black enamel, allowing easy touch-up after extended use.

Torque box and turntable structure paint:
The finished paint color shall be PPG 9000 black enamel, allowing easy touch-up after extended use.

Extension and retraction cylinder paint:
The finished paint color shall be PPG 9000 black enamel, allowing easy touch-up after extended use.

COMMUNICATION SYSTEM

An Atkinson communication system shall be furnished between the platform and the turntable operator's position. The communication speaker at the ladder tip shall require no operator attention to transmit or receive. The transmitting receiving volume controls shall be located at the turntable operator's position.

The turntable console position will be located inside the control console lid.

PLATFORM WARNING LIGHTS

Four (4) M6 LED lights shall be provided on the platform in addition to the NFPA 1901 warning light package. Two (2) of the lights shall be located on the front face of the platform floor structure and two (2) lights shall be located on the side of the platform, one (1) each side. Each light shall be red with clear lens and be manufactured by Whelen. The lights shall be activated with the emergency master. The two (2) front lights will be disabled when the aerial is raised out of the cradle by a cradle switch.

PLATFORM SPOTLIGHTS

All aerial spot/tracking lights lights shall be 12 volt, with on/off switches on each light. The lights shall be mounted below handrail height, so as not to increase the overall height of the vehicle.

TRACKING LIGHTS

Two (2) Whelen PFP1P, 12V, Single Panel, Pioneer Plus, Super LED floodlights, with black protector rings and PBAPEDD mounting bases, shall be mounted at the rear of the base ladder section, one (1) each side. The lights shall be mounted on the outside of the base section, to the front of the lift cradle.

TURNTABLE WORK LIGHTS

Four (4) On Scene Solutions, 9" Night Axe, LED work lights shall be installed to illuminate the platform interior work area. Two (2) lights shall be installed inside the front heat shield and one (1) light shall be installed inside each side top heat shield, rearward of the side access doors. The lights will be activated with the aerial PTO activation.

TURNTABLE WORK LIGHTS

Four (4) On Scene Solutions, 9" Night Stick, LED turntable work lights shall be installed in the turntable step cover to illuminate the turntable area. The lights will be activated with the aerial PTO activation.

WALKWAY ILLUMINATION

The climbing area of the ladder shall be continuously illuminated utilizing a series of blue light emitting diodes (LED's). The LED's shall be located on both sides of each ladder section and be positioned near the ladder rails to maintain a clear walking area. The LED shall be encased in clear polymer tubes to protect the lights from damage. The lights will be activated with the aerial PTO activation.

OUTLETS AT THE PLATFORM

Two (2) 110-volt Firepower weatherproof outlets,with environmental covers shall be furnished. Two (2) shall be installed in the front of the platform. Location to approved by Fire Dept. All receptacles shall be installed to be a minimum of 12" above ground level when the platform is lowered to the ground.

PLATFORM SCENE LIGHTING

Top raise telescoping tripod LED lighting:
Two (2) Whelen Pioneer Plus, PFP2AP1, LED, dual lamp, 120 volt, side mounted, top raise, telescoping tripod scene lights shall be mounted on the rear of the platform, one (1) each side. Each light shall be provided with telescoping poles and shall be switched at the light head. Each light shall be wired into the circuit breaker panel. Each light will have a deflector plate that protects the light pole from tree damage.

Under the platform LED scene lighting:
Two (2) Whelen Pioneer Plus, PFP1AC Series, single lamp, 120 volt, LED flood lights shall be mounted to the front underside of the platform, at the corners, angled 30 degrees outwards. These lights shall illuminate the area to the front of the platform. Each light shall be wired to the platform 110-volt circuit.

One (1) Whelen Pioneer Plus, PFP2AC, dual lamp, 120 volt, LED flood light shall be installed, recessed and centered with a PBA103 mount, on the bottom of the platform angled away from the driver slightly. This light shall illuminate the area underneath platform. The light shall be wired to the platform 110-volt circuit.

Front of platform LED lighting:
One (1) Whelen, Pioneer Plus, PFP1AP Series, single lamp, 120 volt, LED flood light, with PBAPEDA pedestal mount, shall be installed on the front center of the platform. A cutout shall be provided in the front heat shield to allow movement of the light by personnel inside the platform. This light shall illuminate the area to the front of the platform. The light shall be wired to the platform 110-volt circuit.

All platform lighting will be powered by generator and capable of being used while vehicle is in motion if necessary.
With the exception of the (2) telescopic lights, all other platform lights will be activated by button/switch in display/dash and by a button/switch on or near the platform control station

APPARATUS LEVEL INDICATOR

A bubble type level indicator shall be provided at the rear of the apparatus to assist in the aerial device

setup. This device shall be mounted in a Fire Dept approved location and will be visible to the operator setting the outriggers. The leveling indicator shall be backlit and color coded indicating the following conditions:

"Green"	Safe Operating Zone.
"Yellow"	Caution Operating Zone.
"Red"	Do Not Operate Zone – Reposition Apparatus.

FORE/AFT LEVEL

An additional leveling indicator shall be furnished to measure fore and aft level of the vehicle. The indicator shall be mounted on the left torque box wall interior.

AERIAL SIGN PANELS

There shall be a total of two (2) Aerial sign panels provided and installed on the outside of the aerial base section, one (1) each side, for fire department lettering. Each sign panel shall measure approx. 14" wide x 144" long.

AERIAL TOOL MOUNTS

Axe mounting:
There shall be a mount furnished for a flat head axe in the platform. The axe location shall be in the left rear of the platform within the framework of the platform structure. The axe shall in no way obstruct the interior of the platform.

There shall be a mount furnished for a pick head axe in the platform. The axe location shall be in the left rear of the platform within the framework of the platform structure. The axe shall in no way obstruct the interior of the platform.

Pike pole mounting:
There shall be a mount furnished in the fly section of the ladder for a pike pole. The mounts shall include restraints for both ends of the pike pole.

Roof ladder mounting:
There shall be a mount furnished in the fly section of the ladder for a 16’ roof ladder. The mounts shall include restraints for both ends of the ladder.

Stokes basket storage:
A stokes basket storage box shall be provided and installed on the outside of the aerial ladder base section. The storage box shall be totally enclosed and shall include a hinged lid with latches. The storage box shall be fabricated from 1/8” smooth aluminum sheet and shall be approximately 12” D x 27” H x 90” L and painted to match the aerial ladder. The storage box shall be located on the side of the aerial ladder opposite from the turntable control console in order to provide maximum visibility for the operator. The storage box shall be easily accessible from the ladder or body. The aerial sign panel shall be mounted to the outside of the storage box.

Rescue stretcher holders:
Two detachable rescue stretcher holders shall be provided in the platform to place and secure a stretcher across the platform handrails. The stretcher holders shall have storage brackets in the rear of the platform.

Pompier safety belt loops:
Four (4) stainless steel Pompier safety belt loops shall be provided in the platform. The loops shall be located two (2) at the rear of the forward platform entrance gates; one on each side and two (2) shall be located next to the ladder/platform entrance.

Lifting rings:
Two (2) 3" diameter-lifting rings shall be provided under the platform, which shall be attached directly to the platform support arms. The rings shall be rated at 250 lbs each.

Lifting arms: (If available)
Lifting arms shall be provided for the aerial platform to raise and lower items such as stokes baskets, tools, equipment utilizing a hoist/descent device while allowing the aerial to remain stationary. Maximum lifting capacity shall be 500 lb. (250 lbs/arm). Combined lifting capacity of arms and in platform shall not exceed the rated capacity.

Parapet ladder mountings:
A mounting assembly shall be provided on both the left and right side or front of the platform for attaching a straight roof ladder vertically to the platform to access the roof of a structure with a parapet wall. The parapet mounts shall require no tools to place a ladder into service and shall place no excessive stress on any part of the aerial device.

BREATHING AIR SYSTEM

A breathing air system shall be furnished. The breathing air system shall be "pre-piped" from the turntable to the platform using a Kevlar reinforced synthetic air hose. Air from the cylinders shall be routed through the lower regulator reduced from cylinder pressure to airline pressure and then travels up and through the ladder sections to the aerial control console. The air is then routed through an inline air filter and regulator located in the platform.

The breathing air system shall be furnished which will include one (1) 6000 psi DOT air cylinders, mounted one (1) on one side of the ladder base section in accordance with federal DOT practices. Air bottles that are mounted forward of the lift cylinders on the turntable will not be acceptable due to obstructing access to the turntable when the ladder is rotated over the rear of the vehicle.

There shall be a quick coupling at the air bottle valve for easy refilling of the breathing air system without removing the air bottles.

A fifty-foot (50') refill hose shall be provided as loose equipment with this system for recharging the air cylinders.

Two (2) quick disconnect fittings with plugs and retaining chains shall be located in the platform bucket. The air couplings shall be matched to the type required by the fire department.

A low breathing air alarm will be provided in the air line downstream from the high pressure regulator, which will activate a 95 DB fast pulse alarm mounted at the turntable control station and in the platform bucket if the breathing air pressure falls to or below 20 percent of the system capacity. A Class 1 Airminder display shall be installed at the turntable and platform bucket to indicate the percentage of air remaining in the breathing air system.

UNDERWRITERS LABORATORIES TESTING & CERIFICATION

GENERAL

The proposed unit shall be tested and certified for the apparatus manufacturer by Underwriters Laboratories Inc. (UL) Underwriters Laboratories Inc. (UL) is recognized worldwide as a leading third party product safety certification organization for over 100 years. UL has served on National Fire Protection Association (NFPA) technical committees for over thirty years. The testing company shall not be affiliated with the manufacture or repair of the apparatus.

INDEPENDENT TESTING TO BE PERFORMED (MINIMUM)

All work outlined in NFPA 1911, current Edition, including nondestructive testing, shall be conducted at the manufacturer's facility. In addition, the following test work, Certification Test sections of NFPA 1901, 2009 Edition shall be conducted.
a). 1-1/2 Times Rated Capacity on Level Ground Stability Test: A load of 1-1/2 times rated capacity (as specified by the manufacturer) shall be suspended from the tip of the aerial ladder, or the platform of the elevating platform, when it is in the position of least stability. If the manufacturer specifies a rated capacity while flowing water, then one times the water load and the worst case nozzle reaction shall be added to the stability test weights. The apparatus shall show no signs of instability. For a water tower, the stability test includes 1-1/2 times the weight of the water in the system and 1-1/2 times the maximum nozzle reaction force when it is in the position of least stability.
b). 1-1/3 Times Rated Capacity on a 5 degree Slope Stability Test. A load of 1-1/3 times rated capacity shall be suspended from the tip of the aerial ladder, the platform of the elevating platform, or the tip of the water tower when it is in the position of least stability. The apparatus shall show no signs of instability.
c). A friction loss test shall be conducted for an aerial device equipped with a permanent water system and has a rated vertical height of 110 ft. or less. A flow test shall be conducted to determine that the friction loss in the water system between the base of the swivel and the monitor outlet does not exceed 100 psi with 1000 GPM flowing and the water system at full extension.
d). A maximum vertical height flow test shall be conducted to determine that the water system is capable of flowing 1000 GPM at 100 psi nozzle pressure with the aerial device at full elevation and extension. If the apparatus is equipped with a fire pump designed to supply the water system, the test shall be conducted using the onboard fire pump. The intake pressure to the fire pump shall not exceed 20 psi.

WRITTEN EXAMINATION AND TEST REPORT

A complete written Examination and Test Report for each aerial device inspection performed at the manufacturer's facility. The test report, as required by NFPA 1914, shall include the following test results.

UNDERWRITERS LABORATORIES TESTING & CERIFICATION (continued)

a). Torque verification of all mounting bolts including bolt size, grade, and torque specification.
b). The following NDT methods and results shall be recorded. All ferrous welds shall be magnetic particle inspected for defects. All nonferrous welds shall be visually inspected, and if questionable defect are identified, a penetrating dye shall be used to further evaluate the quality of the weld. All bolts and pins shall be ultrasonically inspected for internal flaws. A waterway pressure test shall be performed and a hydraulic oil sample taken.
c). The following measurements shall be taken and recorded in the examination and test record: bearing clearance and backlash, elevation cylinder drift, engine speed operating rpm, relief pressure,

stabilizer extension cylinder drift, ladder section twist, hardness readings, base rail thickness, winch drift, extension brake drift, and extension cylinder drift.

PERSONNEL
The inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

AERIAL APPARATUS CERTIFICATIONS
When the unit successfully meets all the requirements outlined in NFPA 1901, 2009 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA 1911.

MANUALS

The aerial manufacturer shall provide the following manuals pertaining to the aerial device:
Two (2): Operators' manuals.
Two (2): Parts manuals in a CD format.
Two (2): Complete Electrical and Hydraulic Diagrams in a CD format.

SERVICE

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of downtime, the manufacturer of the aerial device shall maintain a network of service centers with factory-trained personnel.

The service facility shall carry an inventory of parts, separate from production parts.

WARNING DECALS

Warning decals shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions. All warning labels shall be in general compliance with A.N.S.I. Z534.1 recommendations.

AERIAL APPARATUS CERTIFICATIONS (TYPE 1)

The aerial device shall be tested in compliance with the National Fire Protection Association's Standard #1911 (latest edition). Ongoing structural and physical property testing during construction will also be done.

The following tests shall be conducted by personnel holding a Level II certification to detect defects and improperly secured components:

1. Magnetic particle inspection shall be conducted on all ferrous welds to assure the integrity of the weldments and also detect any flaws or weaknesses. These tests shall be performed prior to paint or assembly.
2. Ultrasonic inspection shall be used to detect any flaws in pins, bolts and other critical mounting components. The bolts shall be tested after the have been torqued to ensure the bolt was not damage.
3. All extension/retraction cables shall be tested and certified by the cable vendor.
4. Functional tests, load tests, stability tests and visual structural examination shall be performed. These tests will determine any unusual deflection, vibration, or instability characteristic of the unit.
5. Hydraulic oil shall be sample tested prior to delivery.
6. A waterway system pressure test shall be performed.

Upon completion of the preceding inspections, the independent testing company shall issue a Certificate of Inspection indicating that all specified standards have been satisfied. The Type I certification shall be provided by Underwriters Laboratories Inc. (UL). Aerial manufacturers not utilizing third party, independent testing companies shall not be acceptable.

TESTS

The following test shall be conducted to the aerial device prior to delivery, all listed tests shall be witnessed and certified by Underwriters Laboratories Inc. (UL) to ensure the device meets all requirements of NFPA-1901. (Latest addition)

The manufacturer of the aerial device is required to provide a written statement signed by a Registered Professional Engineer certifying the aerial's ability to perform the following tests:

1. 1-1/2:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the ladder sections and platform are so designed and powered to support a load representing 150% of the manufacturer's rated payload capacity at maximum horizontal reach on level ground. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 1500 pounds in the platform with the ladder fully extended at zero degrees shall be rotated 360 degrees.
2. 1-1/3:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the tip and ladder sections and platform are so designed and powered to support a load representing 133% of the manufacturer's rated payload capacity at maximum horizontal reach on a five (5) degree slope. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 1333 pounds in the platform with the ladder fully extended at zero degrees shall be rotated 360 degrees.
3. TIME TEST - A test of the apparatus shall be performed to raise the platform from a bedded position extended to full height and rotated through a 90 degree turn smoothly and without undue vibration in not over 150 seconds.
4. WATER TOWER TEST #1 - A test of the apparatus shall be performed to test it's ability to discharge 1500 gallons per minute parallel to the ladder with the unit at full extension and zero degree elevation. The unit shall be capable of performing this test with a payload of 500 pounds at the platform.
5. WATER TOWER TEST #2 - A test of the apparatus shall be performed to test the ability to discharge 1500 gallons per minute, 90 to the ladder with the ladder at full extension, zero degree elevation. The unit shall be capable of performing this test with a payload of 500 pounds at the platform.

6. WATER TEST #3 - A test of the apparatus shall be performed to test the ability to discharge 1500 GPM above the ladder centerline and as many degrees above 0 degrees as the deck gun design allows. This test shall also be performed with the ladder fully extended at 0 degree elevation with a platform payload of 500 pounds.

Vendors must state their ability to comply with all of the above tests. Failure to do so shall be grounds for rejection of their proposal.

<u>WARRANTY - AERIAL DEVICE</u>

The aerial device manufacturer shall guarantee to the original purchaser to repair or replace any defective structural component resulting from faulty material or workmanship for a period of twenty (20) years after delivery of the aerial device to the purchaser. The warranty shall cover the aerial ladder weldments, open base, torque box and outrigger weldments.

To ensure sole source responsibility of the aerial device, the vendor shall clearly state its intention to warrant the aerial ladder, open base, torque box and outrigger weldments as these integral parts and

components of the aerial device.

WARRANTY - AERIAL DEVICE COMPONENTS

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from faulty material or workmanship, for a period of two (2) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDERS

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from faulty material or workmanship, for a period of two (2) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDER STRUCTURAL

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed parts, resulting from structural defects or failures, for a period of five (5) years after delivery of the aerial device to the purchaser.

WARRANTY - HYDRAULIC CYLINDER SEALS

The manufacturer of the aerial device shall also guarantee the cylinder seals to be free from Type III leakage for a period of two and one half (2-1/2) years after delivery of the aerial device to the purchaser.

WARRANTY - TELESCOPIC WATERWAY ASSEMBLY

The manufacturer of the aerial device shall guarantee to the purchaser to repair or replace any defective or prematurely failed Telescopic Waterway Assembly, resulting from structural defects or failures, for a period of ten (10) years after delivery of the aerial device to the purchaser.

REFLECTIVE STRIPING

The reflective striping shall be supplied and installed.

There shall be diamond grade retroreflective chevron striping applied prior to applying the accessories on the rear of the apparatus.

DEALER SUPPLIED LETTERING

The body lettering shall be provided and installed by the servicing manufacturer/dealership before final delivery of the completed apparatus. Shall match existing Fire Dept apparatus.

The aerial lettering shall be provided and installed by the servicing manufacturer/dealership before final delivery of the completed apparatus. Shall match existing Fire Dept.apparatus.

LICENSE PLATE MOUNTING

A Cast Products, model LP0004-1-B, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate a clear LED light (WL0501) to illuminate the license plate and meet DOT requirements.

OEM SUPPLIED/INSTALLED EQUIPMENT

The following equipment list shall be provided and/or installed with the completed apparatus by the OEM:
Two (2) sets of NFPA compliant Ziamatic folding wheel chocks model # SAC-44-E shall be supplied with the apparatus.
Two (2) sets of Ziamatic folding wheel chock underbody horizontal mounts model #SQCH-44-H shall be installed on the apparatus under the body in a Fire Dept approved location..
Two (2) Alco-Lite or equivalent 28' two (2) section aluminum extension ladders model PEL-28.
One (1) Alco-Lite or equivalent 50' three (3) section aluminum extension ladder with stay poles model TEL 3-50P.
One (1) Alco-Lite or equivalent 35' two (2) section aluminum extension ladder model PEL-35.
Three (3) Alco-Lite or equivalent 16' aluminum roof ladders with folding hooks model PRL-16.
Two (1) Alco-Lite or equivalent 10' aluminum attic ladders model FL-10.
One (1) Alco-Lite or equivalent 12' aluminum attic ladder model FL-12.
There shall be a Little Giant model 17 type 1A 6005-T5 aluminum ladder with patented triple-locking hinges, and 300lb capacity provided with the apparatus. There shall be a total quantity of one (1).
Four (4) Fire Vulcan LED Flashlights model #SL-4451 w/charging base mounted in location TBD
One (1) Lettering/Striping Package to match existing Fire Dept units

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # C

CITY OF HOUSTON FIRE DEPARTMENT

SPECIALTY VEHICLES, ACCESSORIES AND EQUIPMENT SPECIFICATION

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) SOLICITATION NO.: S58-T25507
SPECIALTY VEHICLES, ACCESSORIES
AND EQUIPMENT SPECIFICATION
ATTACHMENT # C

CITY OF HOUSTON FIRE DEPARTMENT SPECIALTY VEHICLES, ACCESSORIES AND EQUIPMENT SPECIFICATION

1. SCOPE

1.1. Manufacturer shall provide specifications for each model name and base vehicle. Each base vehicle shall be priced in Exhibit III. Base vehicles should include, but are not limited to:

- Chassis
- Body
- Exterior compartments and doors
- Interior build out
- Interior lighting
- HVAC
- 12VDC Electrical System
- 120VAC Electrical System (including generator and shore power capabilities)
- Delivery and Training
- Warranty

1.2. A separate section shall be provided that lists ALL vehicle options to be added to the base vehicle/trailers. This section should include a detailed description for each option. Pricing for each option shall be included in Exhibit III.

1.3. Manufacturer shall supply floorplan drawings with ALL base vehicles listed. Drawings shall include:

- Interior Floor Plan View
- Curb Side Interior View
- Street Side Interior View
- Curb Side Exterior View
- Street Side Exterior View
- Front View Exterior View
- Rear View Exterior View
- Roof View Exterior View

2. VEHICLES

2.1. Vehicles may include, but are not limited to, the following:

2.1.1. Police, Emergency Management, Homeland Security

- Command
- Communications
- SWAT Deployment
- SWAT Equipment
- Bomb/EOD
- DUI/BAT
- Prisoner Transport
- Crime Scene
- Hostage Negotiation

2.1.2. Fire Services

- Command
- Communications
- HazMat
- Rescue
- Equipment
- 911

2.1.3. Mobile Medical

- Health
- Dental
- Mammography
- Audiology
- Bloodmobile
- Optometry

2.1.4. Laboratories

- Environmental Testing
- Science and Research
- Advanced Technology

2.1.5. Classroom

- Computer Lab
- Technical Learning
- Workforce
- Job Training

2.1.6. Bookmobiles

3. QUALIFICATIONS

3.1. Manufacturer shall provide a company history overview that illustrates a permanency in the Specialty Vehicle Industry for the last ten (10) years.

3.2. Manufacturer shall provide a three (3) million dollar bid bond/bank letter of credit upon proposal submission.

3.3. Manufacturer shall provide a written analysis of its capabilities in regards to Engineering, Quality Control, Service, Water Testing, Weight Analysis and Project Administration.

3.4. Manufacturer shall maintain a fully staffed warranty, service, delivery, and training department capable of delivery and service to all fifty (50) states.

3.5. Manufacturer shall provide sixty (60) product specific references. References shall include twenty five (25) Fire and Police, twenty five (25) Medical, and ten (10) Bookmobile/Laboratory/Classroom. Reference information should be as follows:

- Department/Hospital/Company Name
- Contact Person
- Phone Number
- E-Mail Address
- Cost of Project
- Exterior Picture of Vehicle

REQUEST FOR PROPOSAL (RFP)

SOLICITATION NO # S58-T25507

ATTACHMENT # D

PRICE PROPOSAL

FOR

EVALUATION PURPOSES

CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) - SOLICITATION NO.: S58-T25507
ATTACHMENT # D

PRICE PROPOSAL FOR EVALUATION PURPOSES

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Ambulance and Emergency Vehicles, Equipment and Accessories

Ambulance and Emergency Vehicles, Equipment and Accessories

CITY OF HOUSTON FIRE DEPARTMENT SPECIFICATIONS FOR 12' AMBULANCE MODULE

1.1 GENERAL SCOPE

The apparent silence of these specifications as to any detail or the apparent omission from them of a detailed description concerning any point shall be regarded as meaning that only the best commercial practice shall prevail and that only material and workmanship of the first quality are acceptable. All interpretations of these specifications shall be made upon the basis of this statement.

These specifications provide for the construction, delivery and mounting of generator- powered ambulance modular bodies to minimum 11,400-lb. GVWR ambulance cab/chassis. These ambulance modular bodies, when mounted to the cab/chassis, will be used by the Houston Fire Department (HFD) for responding to medical emergencies and transporting victims of emergencies to hospitals and trauma centers.

1.2 NOMINAL IDENTIFICATION

The ambulance modular body shall be of such a design that the commercial cab/chassis and the mounted, detachable, modular body, as described herein, shall conform as applicable for nominal identification as a Type 1, Class 1 Ambulance as described by Federal Specification for "Star of Life Ambulance", KKK-A-1822F, dated June 1, 2002 and as most recently amended (hereafter referred to as KKK-A-1822F). In the event of any conflict between HFD detailed specifications and the referenced Federal guideline specification, the City of Houston specification shall prevail without exception.

1.3 VERIFY GENERAL CONFORMANCE

The modular body and equipment as furnished shall be tested to verify general conformance to performance tests of KKK-A-1822F by an independent testing laboratory or a professionally registered engineer. To assure the safety of pre-hospital patients and the technicians working in the module, the successful supplier must provide documentation prior to delivery verifying that the ambulance body module has been fully certified as may be applicable.

1.4 DOCUMENTATION

Certifications(s) and other documentation of tests must be submitted within ten days of written request unless otherwise stated in these specifications. Minimal results of this testing must verify the stability of installation, oxygen handling equipment installations, and stability of the cabinet installations. Equivalent test methods, approved, recommended for approval or recognized by the National Highway Traffic Safety Administration Office or Ambulance Manufacturer's Division Standards of Crash Worthiness, must be provided to qualify as equivalent. Test data submitted must be appropriately documented and/or certified by a registered professional engineer. Failure to provide certification and test documentation that will provide the City of Houston reasonable assurance that the generator-powered ambulance modular body proposed is a stable and safe pre-hospital patient working apparatus may be sufficient cause for rejection of any bid.

1.5 NOTARIZED STATEMENT

Documentation certifying performance to a standard of any part of the modular body, upon

request or accompanying any proposal of "or equivalent" alternatives, must also be accompanied by a notarized statement that the certifying agency is in no way affiliated with or on the payroll of the bidder.

1.6 DESCRIPTION OF TEST PROCEDURE

Provision of certification(s) indicating conformance to standards of the Ambulance Manufacturers Division of NTEA must accompany delivery documents. Also attached must be a complete description of the test procedures used including verifying photographs. No exceptions to these provisions will be allowed.

1.7 APPROVAL BEFORE FABRICATION

Preliminary shop drawings and plans showing the material of construction, size and location of compartments, doors, seats, and any other equipment not specifically described in these specifications should be submitted with bid. Final shop drawings and plans showing the material of construction, size and location of compartments, doors, seats, and any other equipment not specifically described in these specifications shall be submitted by the successful supplier for final approval by HFD no later than 21 working days after pre-construction conference.

1.8 INTENT/TECHNICAL CONFERENCE

In order to reduce the possibility of unnecessary dispute over "intent", implied or specified, the successful supplier shall arrange a technical conference between their plant technician(s) and manager(s) and HFD's quality assurance supervisor(s) prior to initial "fabrication".

1.9 PROGRAM MANAGER

The successful supplier shall designate an experienced and competent individual, acceptable to the purchaser, to perform the supplier's program management function. The designated program manager shall provide a single point interface between the purchaser and the successful supplier on all matters concerning the required generator-powered ambulance body module(s).

1.10 PROGRAM STATUS REPORT

The stipulated program manager shall present a written status report to the purchaser on the progress of the fabrication, mounting, delivery schedule and any perceived potential or existing problems. The scheduled frequency of these written status reports will be determined by HFD's ambulance section manager.

1.11 MANUFACTURER'S PRIOR EXPERIENCE

The modular body manufacturer must have prior experience in the construction of generator-power ambulance modular bodies and have built a minimum of fifty (50) modular bodies that have been operational for at least eighteen months. A provider's list shall be submitted where modular bodies are operating with a contact person's name and phone number upon request.

1.12 UNACCEPTABLE ALTERNATIVES

All parts, that are specified by model and/or manufacturer's number in the bid specifications or approved by the City of Houston as being equivalent, shall be delivered as specified. Failure to comply with "or HFD approved equivalent" will be deemed as unacceptable alternatives.

1.13 REPLACEMENT PARTS

Each bidder should submit with bid an indication of the scope of their ability and intention to stock replacement parts for the ambulance modular body offered. If not submitted with bid, same shall be submitted to Finance and Administration Department, Strategic Purchasing Division, within seven calendar days after receipt of written notice. Failure to furnish this information within the time period requested may be just cause of disqualification of the bid.

1.14 MOUNTED MODULE INSPECTION

1.14.1 Each mounted module shall be inspected by HFD before shipment to determine compliance with the specifications and to test its ability to perform its intended use. Each unit shall comply with all applicable regulations and laws of the State of Texas. Successful supplier shall notify HFD not less than ten (10) working days prior to expected unit(s) completion date(s).

1.14.2 INSPECTION EXPENSES

Expenses for these inspection(s) by HFD personnel (e.g., travel fare, lodging [if required], meals, etc.) will be paid by City of Houston, and is not to be included as part of the bidder's unit price bid for any mounted ambulance body module.

1.15 SUPPLIER DELIVERY REQUIREMENTS

A representative of the manufacturer shall supervise delivery to the City and shall within five (5) days of physical delivery to the City:

A. Demonstrate for each completed module mounted on a cab/chassis that the mechanical systems are performing to specifications and operating correctly to the satisfaction of HFD.
B. Demonstrate for each module that the electrical systems are performing to specifications and operating correctly to the satisfaction of HFD.
C. Occupy a minimum of one (1) working day instructing a representative of HFD on proper maintenance procedures for the module.
D. Provide one (1) copy of the module manufacturer's comprehensive maintenance manual, which shall be inclusive of component and generator servicing.
E. Provide any additional and pertinent maintenance information known to the manufacturer but not routinely included in the manufacturer's maintenance manual.
F. Provide one (1) parts catalog with appropriate identification numbers and descriptions and/or drawings of parts. Parts catalogs shall be inclusive of any modification component parts as well as generator parts.

1.16 SUPPLIER DELIVERY COMPLETION

Delivery and acceptance of any mounted ambulance modular body shall not be complete until requirement 1.12.1 A-F and all other specified requirements have been met to the satisfaction of HFD.

2.0. MODULE SPECIFICATION

2.1. The intent of this specification is to describe an advanced type ambulance body module capable of transporting Emergency Medical Service (EMS) personnel and multiple patients in multiple transport configurations.

2.2. The design of the ambulance body module must be capable of all of the following patient configurations:

2.2.1 The ambulance body module must be capable of transporting two (2) EMS personnel in the module and two (2) “average sized” adult patients in a supine position (i.e., on backboards).

2.2.2 The ambulance body module must also be capable of transporting two (2) EMS personnel in the module and three (3) “average sized” adult patients (excluding a patient on the stretcher) in a secured seated position. In this configuration, no patients would be placed in a supine position (i.e., on backboards).

2.2.3 The ambulance body module must also be capable of allowing EMS personnel to place patients in a combination of supine and seated patients (e.g., one supine and three sitting; etc.).

2.3. EMS personnel must be able to access each patient without undue effort. Ambulance length-width-height dimensions must not exceed the capabilities (under normal operating conditions) of the Ambulance Cab/Chassis specification. The described, fully mounted body module will also display an extremely high level of overall reliability with maximized longevity and must be ergonomically appealing.

2.4. HFD has a 25-year history of successfully utilizing ambulance body modules that receive their electrical power from a generator mounted in an exterior compartment. Prior to that time, ambulance body modules that received their electrical power from the cab/chassis engine, performed poorly. Due to the high call volume, HFD requires a “back-up” means of power in case of cab/chassis failure while on an emergency response. Therefore, HFD requires a generator-powered module.

2.5. All references to “must meet the approval of HFD” or “HFD approved equivalent” will mean that approval or disapproval will occur within ten (10) business days after bid opening, to allow adequate time for HFD to complete the evaluation process.

2.6 MOUNTING

The ambulance modular bodies shall be constructed and fully mounted by the supplier on the specified truck chassis. Mechanical mounting shall be at not less than eight (8) tie down locations, four (4) each side of frame. Tie down locations shall comply with the chassis manufacturer's recommendations so as not to weaken the base frame or void OEM warranty. Tie down bolts must be readily accessible for removal. Builder shall use 3/8" thick x 4" wide steel plate bolted to the base frame of the module and into the side of chassis rail with minimum 5/8", grade 8 bolts and locknuts. Module design shall provide "lift-off" capability by means of four (4) topside lift points with ½” aluminum plate welded to the structural frame. The lift point plates shall be drilled and tapped for a 5/8" bolt that can be replaced easily with a conventional eyebolt. Delivered unit shall be provided with hex-head bolts in place at lift points. Supplier shall provide suitable isolator material to prevent galvanic action between two dissimilar metals.

2.6.1 COMPATIBILITY TO CHASSIS
Supplier shall coordinate with designated HFD personnel to ensure that each modular body is completely compatible to current model year cab/chassis.

2.6.2 CHASSIS RELEASE POINT
The supplier shall be responsible for all shipping and/or freight charges for body mounting, processing and completion.

2.6.3 COMMERCIAL TRANSPORT
The cab/chassis shall be transported by commercially accepted carrier, as necessary, so as to not increase the amount of mileage of each cab/chassis by approximately 100 miles. Odometer readings will be verified during inspection.

2.7 MODULAR BODY CONSTRUCTION

2.7.1 **FRAMING**
The base frame shall be constructed of 3” x 1½” x .188” wall tubing aluminum and 3" x .188" wall channel aluminum. Wall channels to be appropriately located at the eight respective, tie point locations. Wall structures are 1½” x 1½” x .125” aluminum tubing on maximum of 14" centers. Roof structure is 1” x 2” x .125” aluminum tubing on maximum of 14" centers. Two tubing members are to be located in each vertical and horizontal corner eliminating any void areas in the corners and thereby increasing structural strength. All structural members shall be fully welded at each 90-degree joint.

2.7.2 EXTERIOR PANELS
The exterior body side panels shall be .080" sheet aluminum firmly attached to structure with VHB (very high bond) tape and sealed at joints with commercial grade sealer. Roof cover shall be .080” sheet aluminum attached (adhesive) to structure and sealed at all joints. The body, roof and panel joints shall be watertight.

2.7.3 STRUCTUAL STRENGTH and INTEGRITY

2.7.3.1 The exterior of the body shall be finished smooth with slight radius on corners and edges. Ambulance body, as a unit, shall be designed and built to provide impact resistance and patient compartment resistance. The body shall be of sufficient strength to support the entire weight of the fully loaded vehicle on its top or side if overturned, without crushing, separation of joints or excessive deformation of roof bows or reinforcements, body parts, doors, streamers, stringers, floor inner linings, outer panels, and other reinforcements.

2.7.3.2 As evidence that ambulance body meets the above criteria, the module manufacturer shall furnish a certification, by a registered professional engineer or independent testing laboratory, that the ambulance body meets Static Load Test Code for Ambulance Body AMD Standard No. #001. Certification shall be submitted within 21 working days after completion of the first unit.

2.7.4 FASTENERS
All parts of the ambulance body, whenever applicable, shall be fastened together with rust-resistant fasteners in a manner which will preclude loosening of bolts, screws and rivets and cracking of welded joints. It is preferable that fasteners (bolts, nuts, screws, rivets) for body module be American manufactured.

2.7.5 SECURING PLATES

Metal tapping plates welded to the walls, floors or ceiling structures to provide firm securing for installed equipment (cabinets, benches, partition, cylinders, etc.) shall be employed in the ambulance structure. Self- tapping screws shall not be used where subjected to stress.

2.7.6 FILL TUBE ENCLOSURE

One or two gasoline fill tube shrouds, fully recessed, shall be provided on driver's side of module. Design to incorporate a provision whereby small spills will not run down the outside wall of the module and in any event, the design shall be in strict compliance with FMVSS #301. Fuel caps must be flush (or slightly recessed) with module. Manufacturer shall install aluminum protective cover over fuel filler hoses. (Ref.: Sketch #1)

2.7.7 STONE GUARDS

Aluminum treadbrite stone guards shall be located on all four lower outside corners to protect body from debris thrown by tires. Stone guards to be rolled to fit contour of corner posts. (Ref.: Sketch #1, #2, #3, & #4)

2.7.8 WHEEL WELL TRIM

Aluminum treadbrite stone guards shall be provided around each rear wheel well opening with a rounded cut-out to easily accommodate removal of tire. (Ref.: Sketch #1 & #2)

2.8 APPROXIMATE OVERALL EXTERIOR DIMENSIONS

All dimensions are approximate. Actual dimensions should be ±1" of approximate dimension and are measured as unmounted to cab/chassis.

Length: 144 inches (not including rear bumper or emergency lighting).

Width: 96 inches (not including emergency lighting).

Height: 86 inches (not including antenna).

2.9 EXTERIOR DOORS

2.9.1 All exterior body module doors shall be flush type. On inside face, provide a minimum 10" wide reflectorized red stripe at belt-line for protection when doors are open (except compartment doors B, C, D, F, and G).

2.9.2 All compartment doors, excluding compartment F and G, shall be constructed of .100" aluminum panels formed to provide a 1½" thick door. All entry doors shall be constructed of . 100" aluminum panels formed to provide a 2" thick door. Doors shall close on an automotive type weather strip providing watertight integrity (Unigrip SD-352, or equivalent). Compartment F door shall be constructed of a single .100" aluminum beveled edge material.

2.9.3 All compartment doors, excluding compartment F and G, shall be insulated with block polystyrene. A horizontal reinforcement plate shall retain the inside release handle. Exterior

door panels shall be covered on the inside with minimum .063" aluminum attached to the outer door lip.

2.10 DRIP RAILS

There shall be drip rails or suitable deflectors over all entry doors.

2.11 PATIENT COMPARTMENT ACCESS (ENTRY DOORS)

For simplicity, patient compartment access doors will be referred to as entry doors. A passenger side door and two rear doors shall provide access to the patient area. Each door shall be equipped with a slam type latch complying with FMVSS 206. Door latches shall engage the body structure at the top and bottom of the doors. All door hardware linkage to be reinforced and shall operate in tension when handle is operated to release. All latches shall have removable access panels inside door at lock and latching points. Self-locking nuts shall be used on all latches. Attachment between door latches and handles shall utilize aluminum structural flat bar and bracket assembly; no exceptions allowed. Doors shall comply with FMVSS 206 and must meet or exceed AMD Standard #002 (Body and Door Retention Components Test). Door hinges shall be stainless steel continuous hinge with minimum 3/16" stainless steel pin and attached with maximum 2" spacing. Padded vinyl covered head bumpers shall be above both doorways. Bumpers shall be high enough and thick enough to reduce head injuries. (Ref.: Sketch #7)

2.11.1 PASSENGER SIDE DOOR

The passenger side door shall provide a minimum clear opening of 72" in height and 30" in width. Door shall have inside and outside lockable door handle and shall hinge at the forward side. The passenger side door shall have a heavy duty, spring loaded, bar type hold open device mounted at the top. Doorstep shall be 1/8" structural tubing lined with .100" aluminum and painted with anti-skid material. There shall be a 10" reflective stripe on the compartment door panel.

2.11.2 REAR DOORS

The rear doors shall provide a minimum clear opening of 56" in height and 48" in width. Doors shall work in conjunction with each other and shall not have a center post to obstruct insertion of stretcher. Doors shall hinge at the outboard sides. The passenger side rear door shall have inside and outside lockable door handle. Driver side door shall have inside handle only. Both rear doors shall be equipped with two point latch assemblies complying with FMVSS 206. Each rear door shall have a door hold open device (Cast Products "Grabber", or HFD approved equivalent). Rear doorstops shall be mounted with aluminum plate reinforcements behind exterior skin. The inside panels of the rear entry doors shall have 2' x 2' white conspicuity with 6" red overlay.

2.12 EXTERIOR WINDOWS

2.12.1 All windows shall have safety float, solid tempered, dark, smoke-colored glass with screens (E-Z Eye Glass, or equivalent). Glazing shall comply with FMVSS 205. All upper windows shall open and shall have provisions to prevent accidental closure. Passenger side door and rear doors shall have windows with one (1) sliding panel each. All ambulance body doors shall be equipped with not less than 250 square inches of safety glass per door. Door window area shall be minimum 16" high. The window framing shall be extruded aluminum with an inner and outer frame for clamping type installation or gasket type installation. Window width shall be approved by HFD prior to assembly.

2.12.2 There shall be an opening in the front wall of body module designed to interface with the sliding window in the cab to permit visual and audio contact between driver and attendant(s).

2.13 COMPARTMENTS

For simplicity, exterior access storage spaces will be referred to as "compartments" and interior access storage spaces will be referred to as "cabinets". Compartment doors will hinge forward unless otherwise specified. Door bumpers shall be installed on module to prevent damage to body when doors are opened. Compartments A, B, and E shall be automatically lighted (LED strip lighting) when opened. All compartment locations and designs must meet the approval of HFD prior to assembly.

2.13.1 COMPARTMENT A: (OXYGEN)

Approximate I.D. Is 19 7/8" wide x 43" high x 21" deep. This compartment shall be located at the floor line of the module on the driver side and shall be forward to the module front wall. This will allow for horizontal (laying down) mounting of a standard “H” oxygen cylinder (244 cu. ft.) with access through the driver side door. Door bumpers shall be installed on module top and bottom. Door must be vented from inside to outside with one (1) stainless steel vent (Perko #870-2, or equivalent). A vertical divider shall be installed to the rear of the O2 rollers with a shelf from the divider to the forward wall. Supplier shall provide three (3) marine-type rollers and three

(3) ratchet type restraints for securing oxygen cylinder into its appropriate place. There shall be a 3 high “D” cylinder holder in this compartment. There shall be a 10” reflective stripe on the compartment door panel. (Ref.: Sketch #1)

2.13.2 COMPARTMENT B: (FORWARD LOWER DRIVER SIDE)

Approximate I.D. Is 53 5/8" wide x 12 1/8" high x 21" deep. This compartment shall be located directly below the floor line on the driver side and shall butt up against the module forward wall. Door will hinge at bottom with appropriate restraint(s) to allow door to be at a minimum angle of 90-degrees when fully open. Compartment shall have an inverted pan attached to the floor to raise the stored items above the level of the lip and thereby decrease the chance for items getting wet. In addition, compartment shall have a ribbed rubber mat that covers the entire floor section of that compartment. (Ref.: Sketch #1)

2.13.3 COMPARTMENT C: (ELECTRICAL)

Approximate I.D. Is 34 1/4" wide x 23 5/8" high x 21" deep. This compartment is located aft of compartment A and above compartment B. Suitable durable tags or labels shall be used to identify all wiring and cabling between terminations throughout the module. There shall be fail-safe studs in this compartment. Access shall be through the driver side compartment door (not through the interior). (Ref.: Sketch #1)

2.13.4 COMPARTMENT D: (MISC. STORAGE)

Approximate I.D. Is 17 3/4" wide x 14 5/8" high x 21" deep. This compartment is located aft of compartment C and above the wheel well . This compartment shall have a divider accessible from inside the unit with the outside of the divider accessible from the outside only. Impact suction will be mounted on this divider. (Ref.: Sketch #1)

2.13.5 COMPARTMENT E: (FIREFIGHTER GEAR)

Approximate I.D. Is 34 5/8" wide x 41 1/4" high x 21" deep. This compartment shall be located

to the extreme rear (aft) of the module on the driver side. Door shall be hinged at left forward side. Compartment shall have a ribbed rubber mat that covers the entire floor section of that compartment. Compartment shall have a full depth divider for stair chair storage 11" from the rear wall and a shelf from the divider to the front wall at 39" above the floor. The compartment shall have inside access only above the shelf and outside access below the shelf and to the rear of the divider. Due to the potential for noxious fumes from fire fighting gear, a seal shall insure fumes do not enter the upper section and/or the module. There shall be a 10" reflective stripe on the compartment door panel. (Ref.: Sketch #1)

2.13.6 COMPARTMENT F: (BACKBOARDS)

Approximate I.D. Is 21" wide x 9 1/4" high x 75 1/4" deep. This compartment shall be located at the rear of the module on the passenger side and sitting on top generator compartment (G) for the aft section and on top of the wheel well for the forward section. The exterior door opening shall be located next to the rear passenger side exterior door and to be hinged on the right side (passenger side). Gas tube hold open devices shall be installed to door. The preliminary design of the compartment is to store 2 to 3 backboards and 1 Scoop stretcher. (Ref.: Sketch #4 & #7)

2.13.7 COMPARTMENT G: (GENERATOR)

2.13.7.1 Passenger side, aft of wheel well, minimum 37 1/2" wide x 21 3/4" high x 21" deep and not to extend into backboard storage compartment (F). Bottom bolted mount assembly shall be provided of adequate strength to support entire generator weight and provide easy removal from compartment. Mount assembly shall provide for quick removal of entire generator, if necessary.

2.13.7.2 Provide plunger type with swivel post hold open device for compartment door. Compartment door shall provide for an unrestricted 90 square inch area of fresh airflow. Decibel level shall not exceed 70 dB inside module when generator is running. Tailpipe shall exit through compartment door, not below module. (Ref.: Sketch #2)

2.13.8 COMPARTMENT H: (FRONT WALL INTERIOR/EXTERIOR ACCESS)

Approximate interior dimension is 25 1/4" wide x 43 1/8" high x 34 1/2" deep (22 1/2" wide x 114 1/2" high x 21" deep below floor line). Interior of compartment attaches to the front wall (passenger side) and has one (1) shelf approximately 22" from module floor line. The floor shall extend to the door to provide a division between middle and lower sections. Supplier shall provide on upper section, a wall plug, appropriately wired with #12 gauge wire. Appropriate guard at door shall be provided at floor line of door to prevent damage to floor edge. The outside access door is hinged at the forward edge of the module. The interior aft side shall be open for access to the equipment stored inside but no door or containment device will be provided for interior access except a lip on the shelf and on the floor of the compartment. Sufficient padding on driver side and at side (top edges and approximately 12" down from top edges) shall be installed to decrease chance of head injury. There shall be a vertical divider and a 3 high "D" cylinder holder on the floor in this compartment facing the rear to accommodate AutoPulse storage. There shall be a lip up on the shelf and a lip at the bottom of the compartment and the shelves shall have ribbed rubber. There shall be a 10" reflective stripe on the compartment door panel.

2.13.9 **LOCKING SYSTEM**

The electrical (C), and generator compartment (G) doors on all modules shall be keyed alike (i.e., key #201), but shall not be keyed similarly to any other module compartment doors. Both entry doors (i.e., side door and passenger side rear door) and all remaining compartment doors (i.e., compartments A, B, D, E, F, and H) shall be keyed alike.

2.14 INTERIOR BODY MODULE

2.14.1 APPROXIMATE OVERALL INTERIOR DIMENSIONS

All dimensions are approximate. Actual dimensions should be ±1" of approximate dimension.

Length: 140" (not including inner liner or cabinets at upper wall).
Width: 93" (at upper wall not including inner liner or cabinets).
50" (between wheel wells before cot installation).
Height: 67" (not including lights, grab rail, I.V. hangers, etc.).

2.14.2 INTERIOR BODY INSULATION and SOUND DEADENING:

Interior body insulation shall be SpecTape-Insulfab applied to the roof and four (4) side walls . All requirements for self-extinguishment shall be met. Headliner in ambulance module shall be approved fiberglass or plastic, "flat" white color. Additionally, the area behind the step well and Compartment H shall be insulated with Zero Clearance brand (or HFD approved equivalent) insulation for additional heat and acoustic properties.

2.14.3 INTERIOR FLOOR and COVERING

Interior floor underlayment shall be an Alucabond composite material consisting of two (2) pre-finished aluminum cover sheets heat-bonded to a core made of polyethylene plastic. Vinyl flooring shall extend up sidewalls approximately 4" and have a smooth radius from floor to sidewall. Vinyl flooring shall be Lonseal "Lonfloor", or equivalent, (color to be approved by HFD) and be attached to the Alucabond with a VHB (very high bond) tape. Doorsills shall be stainless steel covered with a non-slip surface. Plywood or wood products are not acceptable.

2.14.4 **INTERIOR TRIM and LINING**

2.14.4.1 Walls shall be covered with .090" fiberglass wallboard (Lasco- Glass Product, or equivalent). Doors shall be covered with powder coated aluminum. The material furnished shall be completely smooth and shall be white in color and shall meet the approval of HFD prior to assembly. An aluminum (.063") backing plate must be provided for additional backing for window installation.

2.14.4.2 All exposed edges to be finished with snag free design. Laminated plastic is unacceptable for cabinets due to its tendency to crack and chip in emergency medical vehicular use. Abrasion resistant polycarbonate sliding doors shall have appropriate opening/closing fixtures. Wise trim padding shall be on the edges of the cabinets and countertops throughout the interior of the module. Placement, type and function of fixtures shall be approved by HFD prior to assembly.

2.14.5 CEILING

Interior ceiling cover piece shall be constructed of fiberglass, and laid out with a void area to

allow recessing of lights and fixtures, and easy removal of wiring should it become necessary to replace interior or exterior lighting fixtures.

2.14.6 INTERIOR COLOR

The interior color shall be white. The finish of the entire patient compartment must be impervious to soap, water, and disinfectants to permit field cleaning, washing and disinfecting. Supplier shall submit color samples to be approved by HFD.

2.15 CABINETS

2.15.1 GENERAL

Interior cabinets shall be constructed of formed .100" aluminum and firmly secured within module to structural frame by rust resistant fasteners in a manner that will preclude loosening of bolts, screws and rivets or cracking of welded joints. Inner corners to be finished with trim molding. Metal tapping plates welded to wall or ceiling structures are not required in areas in which direct screw fastening to structural frame is accomplished. Self-tapping screws may not be used in areas where they will be subjected to stress. Interior cabinets to be finished in white color polyurethane enamel. All interior cabinets (except lock box) shall have sliding abrasion resistant polycarbonate doors (minimum 3/16" thick, clear). All dimensions as given are approximate.

2.15.2 CABINET 1: DRIVER SIDE REAR (stretcher sheets, blankets)

Approximate I.D. is 34" wide x 13" high x 20" deep and is located in conjunction with compartment E and below the A/C compartment. Opening shall be 32" wide x 11" high with double sliding doors. (Ref.: Sketch #6)

2.15.3 CABINET 2: DRIVER SIDE WALL (drugs/oxygen delivery)

Approximate I.D. is 48" wide x 24" high x 12" deep and is located directly above wall area 4 and is approximately 33" aft of the front wall. Two shelves, evenly spaced, shall be installed creating three equal levels of cabinet storage. (Ref.: Sketch #6)

2.15.4 **CABINET 3: DRIVER SIDE CORNER** (gloves, large dressings, gowns) Approximate I.D. is 21" wide x 24" high x 21" deep. This cabinet is located between cabinet 2 and 5 and on top of oxygen compartment (A) creating a corner. No abrasion resistant polycarbonate door will be needed. A diagonal cut shelf shall be installed creating near-equal upper and lower levels. (Ref.: Sketch #6)

2.15.5 AREA 4: DRIVER SIDE "ACTION" WALL / COUNTER TOP:

Approximate dimensions of the false wall are 45" wide x 19" high x 4" deep. The false wall will hide radio wiring/cabling, electrical wiring, oxygen hoses, suction hoses, etc. Installed on the action wall shall be an electrical outlet, switches, oxygen quick connect outlet, thermostat, special single speaker grate plate, etc. Cut-out slot for radio will be provided (location to be approved by Communication Management Division Manager). Approximate dimensions of the counter top space is 56" wide x 21" deep (excluding false front) and shall have with a minimum ½" lip around counter top. Counter top shall be powder-coated aluminum or HFD approved equivalent. A mounting platform shall be installed to accommodate a LifePak mount. (Ref.: Sketch #6)

2.15.6 CABINET 5: FRONT WALL-CENTER (bandages)

Approximate I.D. Is 35 1/4" wide x 23 5/8" high x 11 3/8" deep. This cabinet is secured to the front wall and is located between cabinet 3 and 6. Two shelves evenly spaced shall be provided creating three equal levels of cabinet storage. (Ref.: Sketch# 8)

2.15.7 CABINET 6: FRONT WALL-PASSENGER SIDE (I.V. supplies)

Approximate I.D. Is 35 1/4" wide x 23 5/8" high x 11 3/8" deep. This cabinet is secured to the front wall and to the passenger sidewall. Two shelves evenly spaced, providing three equal levels of cabinet storage shall be provided. Cabinets 5 and 6 will create two near-identical side-by-side cabinets. (Ref.: Sketch #8)

2.15.8 CABINET 7: OXYGEN

Approximate I.D. is 36" wide x 16" high x 15" deep. Top will be a lid that is hinged at front wall. Floor edge shall be sealed to prevent seepage under compartment. “H” size oxygen cylinder shall be secured in horizontal position with two (2) straps accessible from underneath top lid. A suitable yoke will be provided for securing the neck of the oxygen cylinder. There shall be a 12VDC outlet on the front wall above cabinet 7. (Ref.: Sketch #8)

2.15.9 CABINET 8: BOLSTER

Cutout on topside of cabinet is approximate 10 1/4" wide x 4 1/4" deep and will house a sharps container. (Ref.: Sketch #7)

2.15.10 CABINET 9: SQUAD BENCH CABINET

Above the squad bench shall be two (2) side-by-side cabinets. Each cabinet shall be approximately 30” long x 10” high x 8” deep with padding on the lower interior edge of both cabinets to reduce head injuries. (Ref.: Sketch #7)

2.15.11 CABINET 10: AC/ HEAT CABINET

Containment shroud for air conditioner/ wall heater unit attaches to structural members welded to the wall framing. The evaporator shall have two white registers with adjustable louvers for adequate air volume and direction. One register will be mounted on the upper forward section to provide air to the CPR seat, the upper torso of the patient, and the Captain’s seat. The other register will be mounted on the upper medial section to provide air to the squad bench seat area and the lower torso of the patient.

2.16 PASSENGER SIDE BENCH SEAT

2.16.1 Bench seat shall be approximately 74" long x 16" high from the floor x 21" wide with three (3) sets of lap (Type I) self-retracting safety belts. Seat belts shall be configured to restrain three (3) side-by-side sitting occupants. Configuration must also be able to restrain and secure a supine patient utilizing three (3) safety belts receivers (positioned at the patient’s chest, hips, and legs) in combination with the self-retracting safety belts used for sitting occupants. The bench seat does not open from the inside (no lid). There shall be a 120VAC duplex outlet at the bench seat.

2.16.2 Bench seats and backrests shall be seamless, vinyl covered (color to match other upholstery) and padded with 3" and 2" foam (respectively). Supplier shall submit color samples to be approved by HFD. Bench seat and backrest shall be secured with magnetic strips. (Ref.: Sketch #7)

2.17 DRIVER SIDE JUMP ("CPR") SEAT

Bench seat and backrest shall be seamless, vinyl covered (color to match other upholstery) and padded with 3" and 2" foam (respectively). Cushioned top shall be 22" wide x 18" deep x 3" high. Aft edge of jump seat shall be 41" forward of rear wall and butt up against cabinet 1. Bench seat and backrest shall be secured with magnetic strips. One set of lap (Type I) self-retracting safety belts (Indiana Mills F10290, or equivalent) shall be installed for passenger restraint. The bench seat cushion shall cover the lid for a cabinet under the bench seat (over compartment D) and shall be hinged on the driver sidewall. The depth of the cabinet shall be approximately 7" deep. (Ref.: Sketch #6)

2.18 TECHNICIAN'S SEAT (CAPTAIN'S CHAIR)

Seat shall be a seamless, vinyl covered (color to match other upholstery) high back "Captain's chair" style without fold-down arm rests capable of transporting children as well as adults (WM1615 from Wise Co., or equivalent). The technician's seat shall be mounted on a heavy-duty swivel base. It shall also be capable of adjustment forward and aft and have a lap (Type I) self-retracting safety belt attached to the chair. Chair must meet or exceed all applicable FMVSS standards. Location and positioning shall be approved by HFD prior to assembly. (Ref.: Sketch #6 & #7)

2.19 MISCELLANEOUS EQUIPMENT

2.19.1 OVERHEAD SAFETY BAR and GRAB HANDLES

Provide one brushed stainless steel overhead safety bar approximately 72" long x 1¼" diameter slightly off center over normal stretcher position. On the inside surface of passenger side access door provide a minimum 1¼" brushed stainless steel boomerang bar type grab handle. On the inside surface of both rear access doors provide a minimum 1¼" brushed stainless steel bar type grab handle. Additionally, on rear wall (passenger side) above bench seat, provide a minimum 1¼" brushed stainless steel bar grab handle. (Ref.: Sketch #6)

2.19.2 RETAINING BAR (PASSENGER SIDE)

Mount a 1¼" or 1½" brushed stainless steel safety rail located at the forward end of the bench seat and above cabinet 8. Location and design shall be approved by HFD. (Ref.: Sketch #7)

2.19.3 STRETCHER, FASTENERS and FLOOR PLATES

2.19.3.1 Stretcher: HFD will furnish the latest edition of the selected stretcher (Stryker, Power-PRO).

2.19.3.2 Fasteners: All required fasteners, hardware, and brackets (including "antlers", rear fastener rail, safety hooks, and Stryker single position stretcher fasteners, model #6370) shall be provided and mounted by the supplier. Aluminum plates, minimum thickness 3/8", shall be built into floor to secure all stretcher fasteners and brackets, using manufacturer approved bolting means. Absolutely no self-tapping fasteners shall be permitted. Mounting dimensions shall be as per stretcher manufacturer's specifications. The safety hook shall be mounted by the supplier in accordance with the Stryker recommendations.

2.19.3.3 Floor Plates: To protect stretcher wheels from damaging floor, protective aluminum floor plates shall be provided under wheels when stretcher is secured in place.

Floor plates shall be flush mounted in the floor of the module and provided with a water-tight seal.

2.19.4 **STATIONARY SUCTION ASPIRATOR DEVICE**

Supplier shall securely mount an electrically operated 12 volt suction aspiration device (SSCOR "on-board" suction system, or equivalent) in Area
4. Suction location shall be approved by HFD. The aspirator system shall provide a free air flow of at least 30 LPM and achieve a minimum of 300 mm Hg vacuum within four seconds after the suction tube is closed. The suction's power shall be activated by an illuminated switch located on the action wall or a switch attached to the suction device, itself. The tubing from the pump must be provided with approved non-collapsible vibration isolating hose and approved tube couplings. The tube shall be well secured to frame and/or body, to protect it from vibration and other possible damage. The suction system shall use 1200cc disposable collection canisters with appropriate filtering devices. (Ref.: Sketch #6)

2.19.5 I.V. HANGERS

Vendor shall mount two (2) near-flush style, rubber I.V. ceiling holders specifically designed for holding I.V.'s, with a Velcro type strap to hold and control movement of I.V. bags. The ceiling holders shall be located directly over the patient's waist/ knee of the primary stretcher and passenger side bench seat. I.V. ceiling holders shall not protrude more than 1". Swing down metal IV hangers that can cause injury shall not be furnished.

2.19.6 WALL MOUNT SUPPLY HOLDERS

Supplier to supply and mount three (3) canvas type wall hanging EMS supply holder with multiple pockets (pouches). There shall be a minimum of four (4) rows of Velcro (or equivalent) strips used for attachment. Tops of the supplies should be visible above the pockets and also visible through a transparent flap. Primary material to be used will be Cordura® and color to match other upholstery.

2.19.6.1 WALL MOUNT SUPPLY HOLDER DRIVER'S SIDE

Wall supply holder is designed to store various ALS supplies (e.g., IV catheters, blood tubes, syringes, etc.). Holder shall be securely mounted below the air conditioning cabinet to allow access from the driver side jump "CPR" seat and designed as follows:

Assuming a 1" trim at the top and a 1" trim at the bottom; plus
½" space between levels; and 1/8" between pockets, then overall length is 19" and overall height is 21½".

Three (3) rows of pockets, each row containing six (6) pockets, for a total of eighteen (18) individual pockets. The top row will have 4" high pockets with a flap attached 3" above the top of the pocket. The middle row will have 3½" high pockets with a flap attached 2½" above the top of the pocket. The bottom row will have 3½" high pockets with a flap attached 2" above the top of the pocket. Pockets will be formed by utilizing 5" of material sewn in a 3" space to accommodate various items.

Flaps will be made of clear vinyl material and will have Velcro strips sewn along the

entire length of the bottom of the flaps. A minimum of 3 pockets per row will have the corresponding part of Velcro strips to adhere to the flaps. (Ref.: Sketch #6, AA and #9)

2.19.6.2 WALL MOUNT SUPPLY HOLDER (DRIVER SIDE) (6 Pockets- double row)
Wall supply holder is designed to store various ALS supplies (e.g., Sodium Bicarbonate and 50% Dextrose). Wall mount supply holder shall be securely mounted to aft, lower side of Cabinet 2 (Driver Side Wall) (exact location to be approved by HFD). Assuming a 1" trim at top and bottom, plus ½" space between levels, and 1/8" between pockets, then overall length is 12" and overall height is 22". Two rows of pockets, each row containing three (3) pockets, for a total of 6 pockets. All 6 pockets are 8" tall with clear vinyl flaps and Velcro. (Ref.: Sketch #6, BB)

2.19.6.3 WALL MOUNT SUPPLY HOLDER (PASSENGER SIDE) (6 Pockets-single row)
Wall mount supply holder shall be securely mounted between the back cushion and seat cushion towards the back of the module.

Assuming a 1" trim at the top and at the bottom, the overall length is 19" and overall height is 8".

This holder will consist of one row of six (6) pockets. The pockets will be 3½" high and will have a flap attached 2½" above the top of the pocket. Pockets will be 5" of material sewn in a 3" space to accommodate various items. The flap will be made of clear vinyl material and will have Velcro strips sewn along the entire length of the bottom of the flap. Two pockets will have the corresponding part of Velcro strips to adhere to the flap. (Ref.: Sketch #7, JJ)

2.19.7 PORTABLE OXYGEN BRACKETS FOR COMPARTMENT A
One (1) two-high "D" size oxygen cylinder brackets shall be mounted horizontally. Bracket is cylindrical in design and shall be at a slight angle of 15-20 degrees to assist in retaining cylinders and secured to the aft side of the lower section of compartment A. (Ref.: Sketch #1)

2.19.8 PORTABLE OXYGEN BRACKETS FOR COMPARTMENT H
One (1) three-high "D" size oxygen cylinder brackets shall be mounted horizontally and at a slight angle of 15-20 degrees to assist in retaining cylinders. Bracket is cylindrical in design and allows cylinders to lie near horizontal. Brackets shall be secured to the floor next to the dividing wall between compartment H and cabinet 7). In the units designated as "Medics", the three-high "D" cylinder holder shall be moved forward 6" (Ref.: Sketch #8)

2.19.9 SHARPS CONTAINER HOLDER
Supplier shall install two sharps containers in two different locations. One shall be located forward of the CPR seat. Location of bracket shall allow EMS personnel to insert sharps container into the bracket without a locking mechanism. The other sharps container shall be located in cabinet 8. Location must meet with the approval of HFD. (Ref.: Sketch #6 & #7)

2.19.10 LOCK BOX
Supplier shall furnish and mount a lockable container for controlled substances. There shall be a punch-pad locking device that contains a key to access the lock box. Location of lock box

shall be directly below Cabinet 5 and aside to Compartment A with easy access from the Captain's chair. Location shall be ergonomically appropriate and meet the approval of HFD. (Ref.: Sketch #8)

2.19.11 FIRE EXTINGUISHER

On the floor, in the passenger side corner of compartment A and compartment H, supplier shall provide and mount a fire extinguisher (multi- purpose dry chemical, Class 3-A, 40 B-C, 5 lb.) in a well secured, quick release bracket in accordance with KKK-A-1822E, 3.15.2 a., and in a location that is ergonomically appropriate and meets the approval of HFD. (Ref.: Sketch #8)

2.19.12 GLOVES CONTAINER

Supplier shall furnish and mount a gloves container for the three (3) different sizes of gloves, inside the module above compartment "H" (Interior/ Exterior access). Location shall be ergonomically appropriate and meets the approval of HFD. (Ref.: Sketch #7)

2.19.13 PAPER TOWEL DISPENSER

Supplier shall securely mount a paper towel dispenser (Combo Towel Cabinet, by Continental Manufacturing Co., model #990W) to the rear wall (passenger side) utilizing support members or backing plate, if necessary. Location must be in an ergonomically accessible location allowing EMS personnel access to opening mechanism and to be able to pull down towels without complications or interference. Location must meet with the approval of HFD. (Ref.: Sketch #7, KK)

2.19.14 TRASH CAN

There shall be a trash can mounted in a bracket on the module side entry door.

2.20 OXYGEN SYSTEM

2.20.1 Supplier shall install, flush, and make ready an oxygen delivery system in accordance with C.G.A. pamphlet G-4.1 and National Standards for Medical Grade Oxygen Service. All hose and tubing shall be approved for medical oxygen service with a minimum rating of not less than 150 psi. The oxygen cylinder valve must be accessible from inside module (Cabinet #7).

2.20.2 An approved flush mounted single wall outlet unit to be provided on driver sidewall (action wall area #4) near the technician's seat (captain's chair). A single outlet shall be installed on passenger side above cabinet #8 and the bench seat (close to the ceiling). A single outlet shall be installed in the ceiling raceway All holes through which system tubing must travel shall be lined with rubber grommets. Hose must be run in split loom protective conduit.

2.21 HEATING and AIR CONDITIONING

Heating and air conditioning shall comply with KKK-A-1822F for performance in both the driver and patient area. The system for the module shall provide total environmental temperature control through a 120VAC heating-cooling unit which can operate in ambient temperatures ranging from 0 degrees to 110 degrees F. The AC/heat unit thermostat controls shall be located at the action wall.

2.22 AIR CONDITIONER

2.22.1 Module air conditioner/heat shall be a 15,000 BTU, 120VAC, self- contained air conditioner unit with a 2.5kW heat strip (Dometic #ASCQ15HO, or HFD approved equivalent). It shall be certified for EPA 2010 requirements with 410A coolant. This unit shall be completely separate from the chassis factory (12 volt) air conditioner and shall be located in the upper rear (aft) corner of the module on the driver side. There shall be an exterior access door to allow complete change out in less than one hour. There shall be two white registers with adjustable louvers for adequate air volume and direction. One register will be mounted on the upper forward section to provide air to the CPR seat, the upper torso of the patient, and the Captain's seat. The other register will be mounted on the upper medial section to provide air to the squad bench seat area and the lower torso of the patient. All wiring shall be quick disconnect type with all plugs easily accessible. Location and dimensions to be approved by HFD prior to assembly.

2.23

2.23.1 Noise level to be such that attendant can perform necessary functions without hindrance. Blower assembly housing shall be metal or other material not subject to distortion. Drainage is to the outside via a hose(s) connected to an evaporator drain pan so that spillage or overflow into the module is prevented.

2.23.2 Air conditioning shall comply with AMD Standard 012 for performance in the patient area.

2.23.3 The warranty period for the module air conditioner shall be a minimum of four (4) years.

2.24 ELECTRICAL EQUIPMENT

2.24.1 All wiring shall be stranded copper with electrical thermoplastic insulation, sized for amp load and connected in accordance with A.S.A.E. standards, minimum size 14-gauge. No wires shall be spliced and wires shall extend from service point to the use point of terminal blocks in such a manner to facilitate replacement. Whenever possible, wires to be run in loom and where wire passes through metal panels, shall use insulating grommets. Solderless connectors of the compression type, or equivalent, shall be used on all wire insulation. All 115-volt wiring in the body module shall be run in metal conduit.

2.24.2 115-volt receptacles

2.24.2.1 Three (3) 115-volt receptacles shall be mounted and appropriately wired with #12 gauge wire to electrical panel in the module for medical devices and/or battery charging systems.

2.24.2.2 One wall plug receptacle shall be located in area 7 on the driver side "action" wall.

2.24.2.3 One wall plug receptacle shall be mounted on front wall of compartment H.

2.24.2.4 One wall plug receptacle shall be mounted on the passenger side-wall centered between the cushions of the bench seat.

2.24.3 CONNECTIONS

2.24.3.1 Body module's primary electrical circuit(s) shall be separate and distinct from vehicle (cab/chassis) circuits. Electrical connections for the body module shall be provided in such a manner as to permit transfer of body module from one cab/chassis to another without having to cut or splice service lines.

2.24.3.2 All wiring shall be color and/or function coded and routed in high temperature conduit or looms conforming to SAE J562 as applicable. All wiring shall be located in an accessible enclosed and protected location and kept at least six (6) inches away from exhaust system (or high heat) components.

2.24.3.3 Electrical wiring and components shall not terminate in the oxygen storage compartment (compartment A). All conduits, looms and wiring shall be secured to the body or frame with insulated metal cable straps in order to prevent sagging and movement which may result in chafing, pinching, snagging or other damage. All apertures on the module shall be properly and fully grommeted for passing wire to conform to SAE1292. Location of electrical panel shall be approved by HFD prior to assembly.

2.24.4 BREAKER PANEL

2.24.4.1 All wiring shall be configured the same for all module bodies purchased and shall be color and/or function coded in accordance with a detailed wire schematic diagram. All schematic diagrams on all module bodies purchased shall be configured the same and shall be displayed on the inside of the electrical compartment door, protected by abrasion resistant polycarbonate. A master circuit breaker panel shall be supplied in electrical compartment of module. This panel shall be labeled for ease in trouble-shooting. Approved solenoids or relays will be permitted in the individual lighting circuits.

2.24.4.2 Damage to sensitive equipment due to voltage spikes shall be minimized by using an acceptable, engineered, industry standard protective device.

2.24.5 BATTERY CHARGER

Supplier shall install a 30 amp, 115 volt, automatic cut off battery charger (Progressive Dynamics, Inteli-Power, model #PD9130; or HFD approved equivalent) to safely recharge and maintain batteries. The battery charger shall be powered from shore power and generator.

2.24.6 SHORE POWER

Supplier shall provide a 30-amp, 115-volt, twist lock male receptacle AC shore power circuit. When connected by extension cord to an appropriate outlet (and generator is turned off), the shore power will allow all electrical accessories, including the AC/heater, to be operational, when necessary, while the ambulance is ready to respond from the fire station or while being serviced at the maintenance facilities. Receptacle shall have a spring loaded cover assembly suitable for wet locations and shall be installed on the driver's side of the module above the electrical compartment. Female connector shall be provided.

2.24.7 ELECTROMAGNETIC RADIATION

2.24.6.1 All electrical components, electronic equipment and devices used and installed on

or in the module shall be electromagnetic radiation suppressed filtered, or shielded to prevent interference with radio and telemetry equipment aboard the ambulance and in the surrounding areas. Such devices and equipment shall be tested and certified to confirm that their RFI does not exceed the maximum limits of SAE J551.

2.24.7.2 The body module shall have an electrical margin of safety. The delivery documents shall be accompanied by a margin of safety check list, which includes every item of electrical equipment on the module and a margin of safety calculation, which results in a positive margin of safety.

2.24.8 ELECTRICAL POWER TAKE-OFF TERMINALS

2.24.6.2 Supplier shall provide three (3) heavy-duty electrical power take-off terminals for supplying DC voltage to various communications and electronic devices installed in the ambulance. One terminal shall be switched, one shall be “hot”, and one shall be fail-safe.

2.24.6.3 Chassis only auxiliary 12VDC circuits located on the truck fuse block shall be powered through the chassis alternator/battery system when the ignition is on.

2.24.8.3 Module 12VDC circuits located on the fail-safe fuse block shall be powered through a 115VAC to 12VDC 80 amp regulated, power supply (Progressive Dynamics PD9180A, or equivalent). The power supply shall be mounted in the electrical compartment (C) a minimum of four (4) feet above ground level when mounted on the vehicle. The power supply is to receive its AC power from the generator installed in the ambulance body module or from activation of the shore power circuit. However, if shore power is activated, generator must be automatically disconnected via the shore power relay which must be wired for G.F.I. (i.e., hot and neutral must be isolated).

2.24.8.4 In the event of failure of the generator unit, the DC power source for both module electrical systems and radio equipment in the module will be switched from the power supply to the chassis alternator/battery power source. This power source change shall be accomplished automatically and instantly if power is lost from the generator. The DC power supply unit must have current limiting and over voltage protection with a means of adjusting the current and over voltage levels for correct current and voltage levels, as required.

2.24.9 WIRING and CABLING

All cabling penetrating any wall, panel or any sheet metal, shall be protected by being covered with split loom or equivalent. Openings made in the wall of the module for routing of cables and wiring between the various units of electrical equipment, shall be sealed with RTV.

2.24.10 FUSES/RELAYS

2.24.10.1 All primary voltage (12V-DC) wiring shall be fused. Fuses shall be installed near the voltage source terminal in electrical compartment (C). No primary voltage wiring shall penetrate any metal panel without being fused first.

2.24.10.2 Fuses under 12-ampere capacity may be "in-line" fuse- holder type. Fuses rated at

more than 12 amperes shall be of the stationary mounting, "snap-in" type. 12V DC circuits must also utilize relay switching. Relays and fuse blocks must have screw terminals for positive attachment of wires relative to crimped connections. Relays with screw terminals shall be Bosch (or HFD Approved equivalent) 75 amp.

2.24.10.3 Circuit breakers shall be used where recommended by the manufacturer of the electronic device and as normally furnished by the manufacturer. All fuses and circuit breakers shall be located in the electrical compartment (C) and conveniently, accessible for prompt fuse replacement and/or resetting. No protective device shall be located in a manner that requires removal of any equipment to restore voltage after a voltage interruption.

2.25 COMMUNICATIONS

2.25.1 EQUIPMENT

HFD requires wiring to support one (1) UHF mobile radio, one (1) Mobile Data system, a Global Positioning System (GPS), and one (1) laptop with docking station. Vendor shall supply and install wiring at the locations specified by the Communication Management Division Manager (CMDM):

2.25.2 INSTALLATION

Supplier shall run from the studs in the electrical compartment:

- One 8 gauge red wire with fail-safe 12V to a brass stud at the console;
- One 8 gauge red wire with constant 12V to a brass stud at the console; and
- One 10 gauge black wire from vehicle ground to a ground stud at the console.

All wiring shall be fused at the source with a fuse capable of supplying the maximum rating of the wire. The Communication Management Division Manager (CMDM), before installation, shall approve all equivalent items in writing. Documentation of the supplier's recommended cable routing and terminal strip locations shall be submitted to the CMDM for written approval. Supplier shall install all equipment at a facility approved by the CMDM and submit documentation of the communications installation experience of all personnel installing electronic equipment. Documentation of the supplier's recommended cable routing and terminal strip locations including blueprints depicting locations of equipment, wiring, and antenna locations shall be submitted to the CMDM for written approval. The intent of HFD is to have all wiring pre-run allowing HFD to simply install the communication equipment at the terminal end of the wiring. The CMDM shall approve all "or equivalent" submissions.

2.25.3 MOUNTING and BACKING PLATES

All mounting plates and/or brackets shall be securely bolted into place by the use of bolts, nuts, and locking washers. No self-tapping screws shall be used for mounting equipment components (base plates, etc.). Backing plates shall be required where heavy components are mounted to sheet metal panels.

2.25.4 DOCKING STATION

Vendor shall mount docking station and accompanying equipment (supplied by HFD) for the laptop onto the action wall counter top in an ergonomic location that meets the approval of HFD.

2.25.5 GROUNDING

All components requiring connection to the vehicle electrical system shall be grounded to the vehicle electrical ground.

2.25.6 MOBILE ROOFTOP ANTENNA

2.25.6.1 EQUIPMENT

Vendor shall mount six (6) antennae provided by CMDM.

Five (5) coax antennae cables (MB8UM) shall be provided and terminate in the radio console, electrical compartment, or at the action wall per CMDM. (Ref.: Sketch #5)

2.25.6.2 CONDUIT

HFD requires the easy removal and replacement of all antenna and power cabling to minimize the time required for cable repairs.

2.25.6.3 COAXIAL CABLE

The coaxial cable shall be Antenex MB8UM, or equivalent, and shall have a shield effect of 95% or more. Supplier shall obtain prior authorization to use an equivalent coaxial cable from the CMDM.

2.26 REAR STEP BUMPER

2.26.1 A full width, three piece, rear step and bumper shall be provided, fabricated from "grip strut" aluminum, minimum seven (7) inches deep. The support shall be designed with sufficient strength to support a test weight of 500 pounds without flexing and shall be capable of folding upward. Separate, outer ends of bumper are to be fabricated out of . 188" aluminum plate in a smooth, snag-free manner. All edges to be rounded or ground smooth.

2.26.2 Bumper with rubber dock guards must be of sufficient strength to withstand 5 mph impact without damage. In addition, supplier shall provide suitable reinforcement (minimum .125" aluminum square tubing) behind dock guards perpendicular to bumper. Bottom of bumper must not extend below module body, nor may any structural attachment to module or chassis extend below module body.

2.27 MODULE ENGINE / GENERATOR

2.27.1 NORMAL FUNCTIONS

The body module generator shall be capable of being individually started from within both the generator compartment (G) and from within the driver compartment of the cab/chassis. Generator shall provide the primary electrical source of power for all module functions, including, but not limited to:

- Air conditioning,
- Heating,
- 120 VAC side scene lights,
- Interior module lights,
- Radios, and
- All emergency lights
- Wall-mount (electrical) suction.

2.27.2 FAIL SAFE FUNCTIONS

In the event module generator should fail, electrical power will automatically switch back to the cab/chassis alternator system through two (2) heavy-duty relays; thereby providing electrical power for:

- All exterior emergency lights,
- Interior module lights,
- Radios, and
- Wall mount (electrical) suction.

2.27.3 REFERENCE BRAND

Module generator shall be an Onan "Commercial 5.5HGJAD-2274J", or latest original equipment manufacturer's fuel injected model, or a HFD approved equivalent.

2.27.4 EXHAUST SYSTEM

The exhaust system shall consist of heavy-duty wall exhaust pipe appropriately mounted to the engine with exhaust pipe extending out the passenger side of the module. Tailpipe shall not protrude below module body. Tailpipe shall exit through generator compartment door (G). The vent area below the generator shall be per manufacturer's recommendations.

2.27.5 ENGINE MOUNTING

Generator shall be securely mounted and vented per manufacturer's specifications.

2.28 115-VOLT AC CIRCUITS

2.28.1. Each 115-volt circuit will be protected by a minimum 15-amp breaker, except for the AC/Heater circuit, which will be protected by a 25-amp breaker. All 115-volt wiring will be done per National Electrical Code(s). The 115-volt wiring from the generator and shore power line will be a minimum 10-gauge wire. The 115-volt wiring for all individual circuits will be a minimum 12-gauge wire.

2.28.2 Five (5) 115-volt AC circuits in the breaker panel shall provide power for the:

- Module air conditioning/heater unit,
- Module 115-volt to 12-volt 80-amp regulated power supply,
- blank (for future use),
- Module 115-volt receptacles, and
- Side scene light circuits.

2.28.3 A 30-amp locking male plug shall be installed on the generator to connect to the module load center. All 115 volt wiring from the generator shall be encased in a metal conduit and properly secured with metal clamps. A 30-amp female plug shall be installed from the generator to allow for quick connection to a service center load bank.

2.29 LIGHTS; INTERIOR AND EXTERIOR

2.29.1 INTERIOR DOME LIGHTS

Eight (8) flush mounted interior LED lights (Grote Manufacturing, Model

#61E61, or HFD approved equivalent) shall be installed in the ceiling of the module. These lights are to be controlled by appropriate switches inside module on the driver side action wall (Ref.: Sketch #6). Interior lights to be in a staggered configuration with primary lighting concentrated over stretcher area. All interior light sockets are to be insulated to prevent internal shorting between socket and housing. These lights shall meet the approval of HFD.

2.29.2 REAR LOADING LIGHTS

Two (2) surface mounted Whelen M9 series LED load lights (or HFD approved equivalent), clear in color, shall be mounted above the rear doors, but shall not protrude above roof line. Switching for load lights shall be wired to meet the following requirements:

- Load lights will turn on when the cab/chassis is shifted into reverse gear and shall turn off when shifted to a different gear.
- Load lights will turn on when the passenger-side rear door is opened and turn off when the door is closed.

2.29.3 SIDE SCENE LIGHTS

Two (2) FRC Spectra 900 LED side scene lights to be mounted one per side, (or HFD approved equivalent). Each light shall be operated from a single lighted switch installed on the cab console (location of lights to be approved by HFD prior to assembly).

2.29.4 EMERGENCY FLASHING LIGHTS

All emergency-flashing lights shall be surface mounted, current production linear LED lights (Whelen M Series; maximum intensity, or HFD approved equivalent) with chrome flanges and shall not protrude above roofline. All Emergency LEDs shall have clear lenses.

2.29.4.1 Corners: Two (2) Whelen M9 series red/clear split (clear to the inside) LEDs with clear lenses shall be installed on each side of the upper corners of the module body for a total of eight (8) lights. Lights shall be capable of 125 flashes per minute. (Ref.: Sketch #1, #2, #3 and #4)

2.29.4.2 Front: Five (5) Whelen M9 series red/clear split LEDs with clear lenses shall be mounted in-line on the front wall of the module body below the level of the corner lights. (Ref.: Sketch #3)

2.29.4.3 Rear: Three (3) Whelen M9 series LEDs shall be mounted on the rear wall of the module body. One (1) red/amber split LED with a clear lens shall be centered between and in-line with corner lights. Two (2) red/amber split LEDs with clear lenses (amber to the center) shall be in-line with rear door windows (one on each side) so that lights are visible through window when door(s) are open. (Ref.: Sketch #4)

2.29.4.4 Sides: One (1) Whelen M6 series red LED with a clear lens shall be mounted above each wheel well. (Ref.: Sketch #1 & #2)

2.29.5 BRAKE/TURN SIGNAL LIGHTS

All emergency-flashing lights shall be surface mounted, current production linear LED lights (Whelen M9 Series; maximum intensity, or HFD approved equivalent) with chrome flanges.

UPPER: On the rear of the module, on either side of the doors, between the upper and lower LED emergency flashing lights, install one (1) Whelen M9 series red LED light.

LOWER: On the rear of the module, in the lower aluminum, install one (1) 4" round clear LED backup light (Grote 62091, or HFD approved equivalent) and one (1) 4" round red LED brake light (Grote 54332, or HFD approved equivalent). Lights shall be mounted side-by-side, one set per side. Sequence shall be clear on the inside and red on the outside.

2.29.6 CLEARANCE LIGHTS
LED clearance lights shall be mounted on all upper corners of module as required by State Of Texas Motor Vehicle Code (forward-amber; rear- red).

2.29.7 BACKUP ALARM
One (1) electronic sound level adjusting backup alarm (Ecco SA914, or HFD approved equivalent) shall be mounted to operate when vehicle is placed in reverse to warn individuals behind, that ambulance is backing.

2.29.8 OPTICOM
One (1) Opticom emitter shall be mounted on the front wall between the upper two LED corner lights. This emitter shall be activated when the emergency warning light switch on the console is "On" and deactivated when the emergency warning light switch is "Off". In addition, while the emergency warning light switch is "On", the emitter shall be deactivated when the transmission is in "Park" and reactivated when the transmission is in "Drive".

2.30 PAINT
The surface shall be prepared, primed and painted per paint manufacturer's urethane enamel system (e.g., PPG, Sikkens, etc.). Module shall be painted GM Victory Red to match Chevrolet chassis.

2.31 LETTERING AND STRIPING
All lettering shall be decal type reflective material (3M, or HFD approved equivalent). The words "MEDIC" and "AMBULANCE" (along with the 2 or 3 digit corresponding numbers) designate the specific module to a specific station and medical classification. Because of HFD's dynamic arrangement, ambulances are moved around periodically. Therefore, the word, letter, and number combinations will be provided to successful bidder at a later date by HFD (as close to completion date as practical). Bubbles under lettering, striping, and decals will not be acceptable. Layout shall be approved by HFD prior to assembly.

2.31.1 DRIVER SIDE AND PASSENGER SIDE VIEW

2.31.1.1 The words "HOUSTON FIRE" (size: 6"; color: blue with white outline; font: Arial Bold) in an arched format over the EMS logo decal shall be adhered on both sides of the module.

2.31.1.2 The word "MEDIC" or "AMBULANCE" (size: 4"; color: blue with white outline; font: Arial Bold) shall be adhered on both sides of the module, and to the right of the words "HOUSTON FIRE" on the driver side and to the left on the passenger side. The corresponding station numbers (size: 8"; color: blue with white outline; font: Arial Bold) shall be centered below the word "MEDIC" or "AMBULANCE" and centered between the roofline and the top of the white

beltline stripe.

2.31.1.3 The letters “EMS” (size: 10”; color: blue with white outline; font: Arial Bold) shall be adhered on both sides of the module below the EMS logo decal. A short EKG rhythm strip (portraying a normal sinus rhythm) shall be attached, on both sides, to the letters “EMS”. (Ref.: Sketch #1 & #2)

2.31.1.4 The words “Emergency Dial” and the numbers “911” (size appropriate to fit inside the 10” white beltline stripe, color: red) shall be located on both sides toward the rear of module.

2.31.1.5 The letters “HFD” (size: 10”; color: white; font: Arial Bold) shall be adhered on both sides of the cab/chassis door below the white beltline stripe.

2.31.2 FRONT VIEW

2.31.2.1 One letter (either “M” or “A”) shall be adhered close to the roofline on the passenger side (size: 10”; color: white; font: Arial Bold). (Ref.: Sketch #3)

2.31.2.2 Two (2) or three (3) corresponding station numbers shall be adhered close to the roofline on the driver side (size: 10”; color: white; font: Arial Bold).

2.31.3 REAR VIEW

2.31.3.1 The letters "HFD EMS" shall be adhered on the rear doors below the rear door windows and above the red belt line (size: 6”; color: red; font: Arial Bold).

2.31.3.2 One letter (either “M” or “A”) shall be adhered below the surface mounted LED lights on the driver side (size: 10”; color: white; font: Arial Bold).

2.31.3.3 Two (2) or three (3) numbers, corresponding to the station, shall be adhered below the surface mounted LED lights on the passenger side and an additional set adhered to the inside surface of the passenger side rear door (size: 10”; color: white; font: Arial Bold).

2.31.3.4 The words “Emergency Dial” and the numbers “911” (size appropriate to fit inside the 10” red beltline stripe, color: white) shall be located on the rear of module. (Ref.: Sketch #4)

2.31.3.5 Fluorescent yellow green conspicuity with 6” red overlay shall be on the entire rear of the module including the rear entry doors in a chevron pattern.

2.31.4 TOP VIEW

The letter, either “M” or "A" and two (2) or three (3) corresponding station numbers shall be adhered to the roof to enable personnel to recognize the vehicle when viewing from above (e.g., helicopter, roof top, etc.)(size: 16”; color: red; font: Arial Bold). (Ref.: Sketch #5)

2.31.5 BELT LINE

A white belt line reflective tape stripe (3M or equivalent) approximately ten (10) inches high shall encircle the entire unit (except the area directly behind the cab, the rear wall and the rear entry doors). Belt line stripe shall be bordered above and below with a ¼” black pin stripe.

(Ref.: Sketch #1, #2, & #4)

2.31.6 DECALS and STICKERS

2.31.6.1 The EMS logo (approximately 12" diameter round) shall be adhered on both sides of the module, in between the words "HOUSTON FIRE" and the letters "EMS". (Ref.: Sketch #1 & #2)

2.31.6.2 The Houston Fire Department emblem/shield decals shall be furnished for HFD to apply to both cab/chassis doors, centered above the letters "HFD". (Ref.: Sketch #1 & #2)

2.31.6.3 "NO SMOKING – OXYGEN IN USE" danger signs with adhesive backing shall be attached to both sides of the interior walls above the backrests. One additional sign shall be attached in the cab of the ambulance in plain sight of the passenger. The approximate size shall be 3 ½" x 6 1/2".

2.32 INSTALLATION OF AMBULANCE CAB/CHASSIS ITEMS

Supplier shall be responsible for installing and/or connecting all items that are specified in the Ambulance Cab/Chassis specification as requiring connection to the module. For example, but not limited to:

1. Air suspension compressor and related components
2. Cab bellows
3. Gas tank filler hose
4. Electrical system

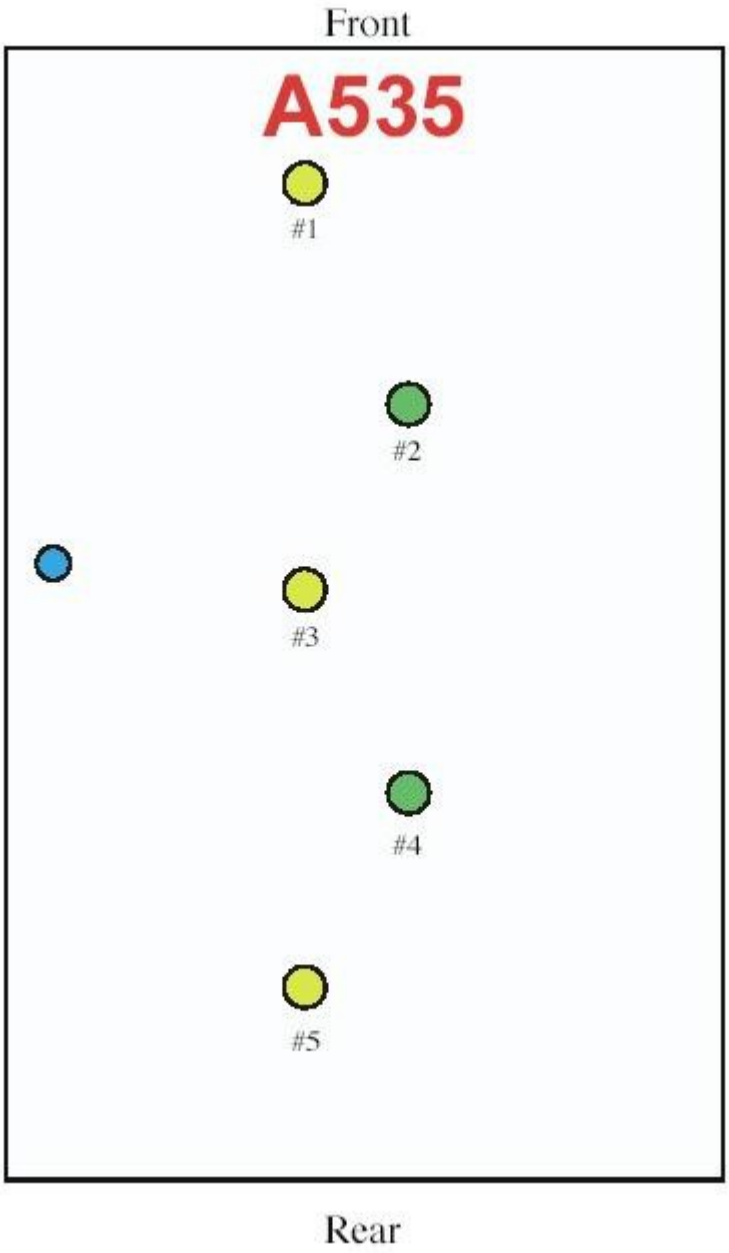
SKETCH #1: EXTERIOR – DRIVER SIDE VIEW

SKETCH #2: EXTERIOR – PASSENGER SIDE VIEW

SKETCH #3: EXTERIOR – FRONT VIEW

SKETCH #4: EXTERIOR – REAR VIEW

SKETCH #5: EXTERIOR – TOP VIEW



#1 - 450 - 470 MHz Main Radio
(terminated in cab console)

#2 - 800 MHz Mobile Data
(terminated in cab console)

#3 - 450 - 470 MHz(Spare, coiled up in side box compartment)

#4 - 800 MHz Main Radio(Spare, coiled up in side compartment)

#5 - 450 - 470 MHz Rear Radio
(terminated in side compartment)

GPS Antenna - terminated in cab console

Antenna Part #s:

1, 3, & 5 - 450 - 470 MHz
Part No: LP450NMO(W)

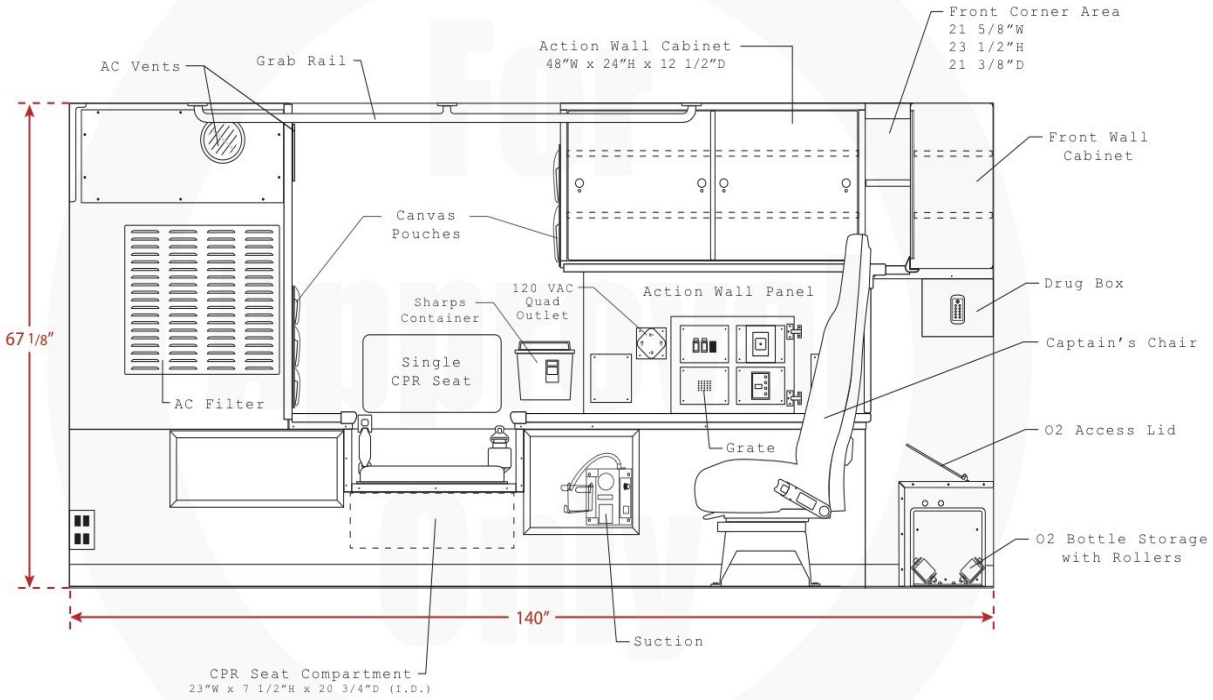
2 & 4 - 800 MHz
Part No: LP800NMO
Vendor: Radial Larsen
1.800.268.3662 or on the web @
www.radiallarsen.com

SKETCH #6: INTERIOR – DRIVER'S SIDE VIEW

FRAZER

Houston Fire Department - Type I - 12' Module

Interior Driver Side Wall



Note: Dimensions are Approximate

toll free: (888) 372-9371
main: (713) 772-5511
fax: (713) 995-0541
www.frazerbilt.com

Main: 7227 A Rampart Houston, TX 77081
Shipping: 7227 Rampart Houston, TX 77081
Mailing: P.O. Box 5000 Bellaire, TX 77402-5000

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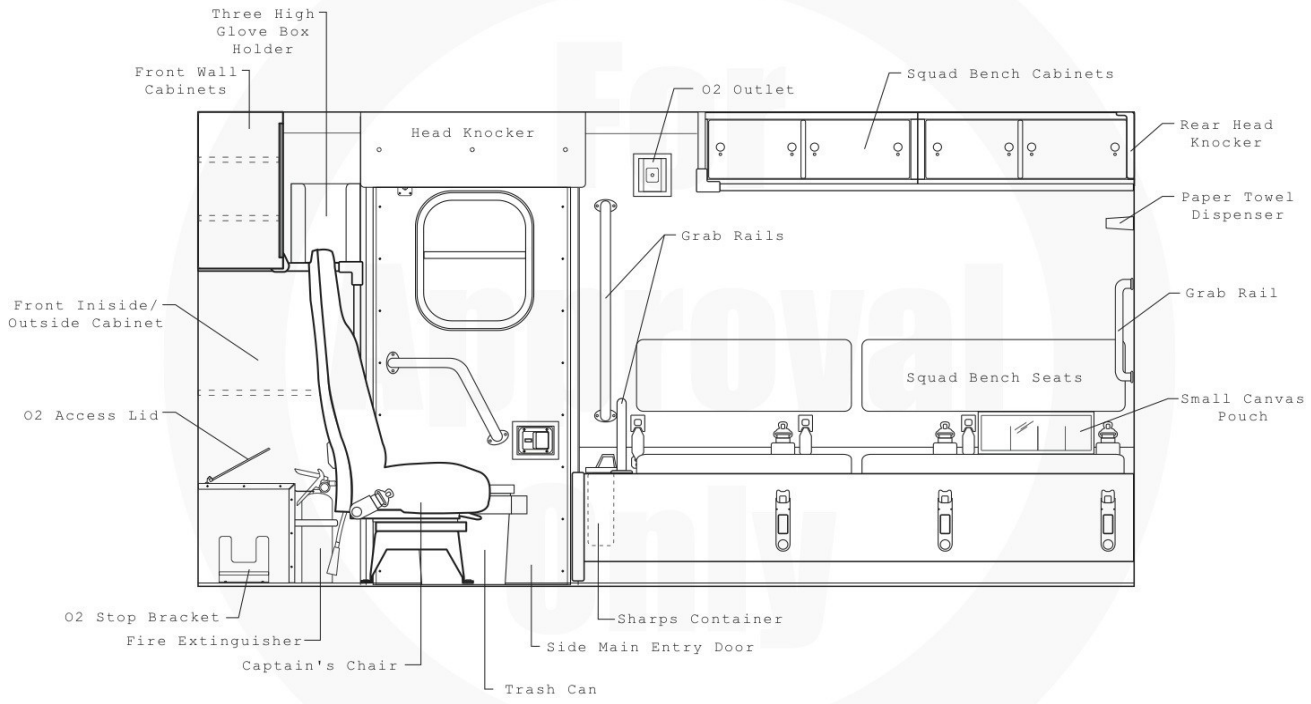
February 11, 2015

SKETCH #7: INTERIOR – PASSENGER'S SIDE VIEW

FRAZER

Houston Fire Department - Type I - 12' Module

Interior Passenger Side Wall



Note: Dimensions are Approximate

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February 11, 2015

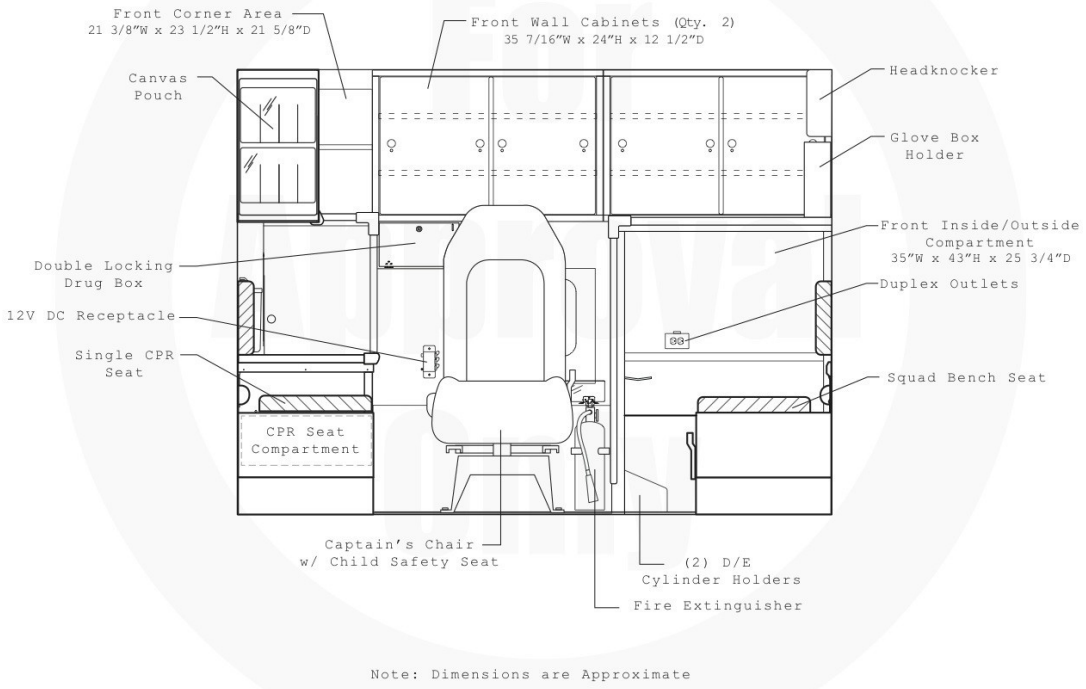
CITY OF HOUSTON

REQUEST FOR PROPOSAL (RFP) - SOLICITATION NO.: S58-T25507
ATTACHMENT # D

FRAZER

Houston Fire Department - Type I - 12' Module

Interior Front Wall



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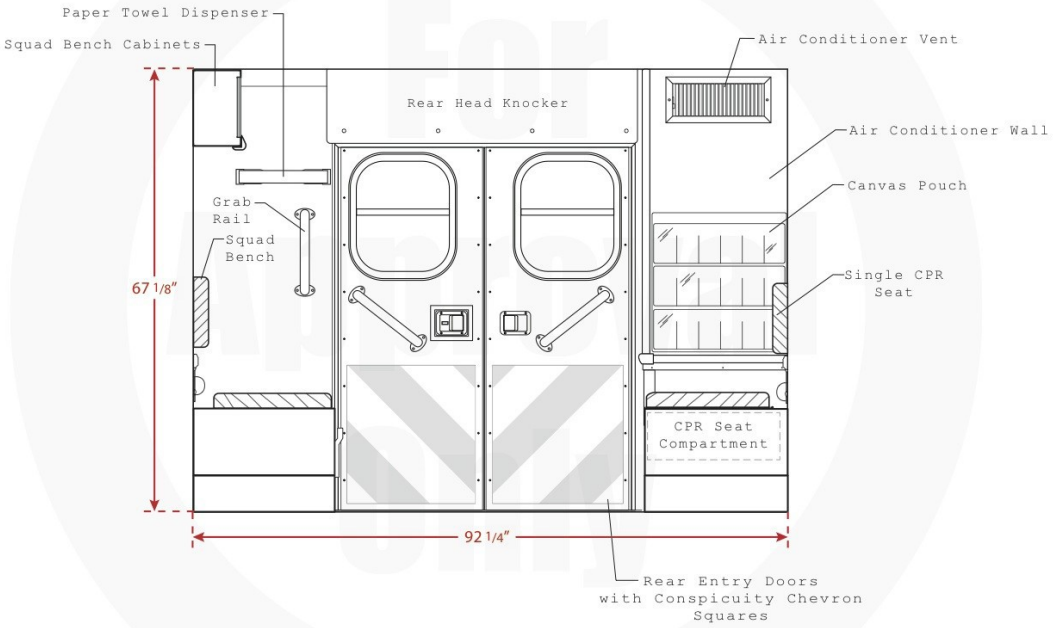
February 11, 2015

FRAZER

Houston Fire Department - Type I - 12' Module

Interior Rear Wall



Note: Dimensions are Approximate

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February 11, 2015

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Ambulance and Emergency Vehicles, Equipment and Accessories

1.1. Vehicle: Type I, 14' Dodge Ram 4500

1.1.1 Dodge Ram 4500 Diesel Chassis

Gross Vehicle Weight Rating:	16,500#.
Wheel base:	192.5 inches.
Cab to Axle:	108 inches.
Engine:	6.7L Cummins Turbo Diesel.
Transmission	6 speed auto AISIN AS68RC.
Axles:	Rear axle: single reduction, 12,000#, 4.44 ratio, dual wheels, stabilizer bar. Front axle: 7,000#, stabilizer bar.
Shock Absorbers:	Factory front and rear. Factory front steering dampener, for Max GAWR
Tires:	Steel radials. Seven tires. Steel wheels.
Wheel Covers:	Four stainless steel.
Brakes:	Power assisted four-wheel disc antilock.
Steering:	Power steering.
Battery, Ignition:	Factory dual, maintenance free.
Alternator:	Factory single, 220 amp.
Safety Belts:	Factory seat belts.
Headlights:	Commercial standard.
Cab Trim:	Deluxe exterior trim package.
Bumpers:	Standard factory chrome front bumper.
Turn Signals:	Self-canceling type for front and rear commercial standard lights.
Fuel Tank:	Factory tank (s).
Dash Instruments:	Factory gauges.
Windshield Wipers:	Dual intermittent with washers.
Air Conditioner:	Factory air conditioner.
Heater:	Factory heater.
Sliding Window:	Factory installed sliding window in driver's cab rear glass.
Cab Interior:	Manufacturer's deluxe (SLT level) interior with factory bucket seats and black vinyl floor covering.
Rear view mirrors:	Standard rear view mirror.
Exterior Mirrors:	Power, heated 7" x 10" w/ built in wide view mirror.

Comply_____Yes_____No

1.1.2 Additions to Cab/Chassis

An aluminum, powder coated console shall be provided to house switches for emergency lights, scene lights, module interior lights, rear load lights, and other switchable items. Door and compartment open warning lights, one (1) 200 watt siren, the generator start/stop switch, the digital generator hour meter, and the generator fuel gauge shall also be at the console.

Comply Yes_____ No _____

One hand held 400,000 CP spotlight with momentary switch, coiled cord and safety shroud shall be provided. Two (2) 100 watt speakers, two (2) 4”x3” LED grille lights and two (2) 4”x3” LED intersection lights shall be provided and installed on a black painted steel override grille guard. A back-up alarm and mud flaps shall also be provided.

Comply Yes_____ No _____

2.1. Module Specification Scope:

This specification describes an advanced module where the electrical and environmental systems operate independently of the cab-chassis electrical and environmental systems.

Comply Yes_____ No _____

2.2. Mounting:

The module shall be constructed and fully mounted by the successful bidder onto a chassis that will be furnished by the bidder, unless otherwise noted. The module shall be mounted to the truck chassis at ten (10) tie down locations - five each side of the frame. Tie down locations shall comply with the chassis manufacturer's recommendations. Mounting plates shall be 3/8" x 4" x 10" steel plates bolted to the module base frame, then bolted to the chassis rails with 5/8" grade 8 bolts (minimum 4 bolts per tie-down location). This mounting system conforms to the chassis manufacturer’s recommendation for mounting second unit bodies (modules) weighing over 1800 lb. The module shall include four (4) upper lift strength plates (1/2" aluminum plate welded to the structural frame), which shall support lifting the module during mounting by a 4 pint lift strap.

Comply Yes_____ No _____

2.3. Module Construction:

The base frame shall be constructed of 3" x 1 1/2" x 3/16" wall tubing and 3" x 3/16" wall channel. In order to limit unnecessary weight and to maintain structural strength, 6061 T6 alloy aluminum shall be used. The driver side, passenger side, front walls, and roof structure shall be 1 1/2" x 2" x .125" tubing on 14" centers. Double tube members shall be located at all vertical corners and single tube members shall be located at all horizontal corners eliminating void areas in the corners and thereby increasing structural strength. All structural members shall have full welds at each 90˚ joint. The rear wall structure shall be 2" x 2 1/2" x .125" tubing.

Comply Yes_____ No _____

The roof and side body panels shall be minimum .080 sheet aluminum attached firmly by VHB tape (3M or equal). Short radius trim shall cover all edges. The body shall be of

sufficient strength to pass the static load test referenced in KKK-A-1822F.

Comply Yes_____ No _____

Aluminum 1/4" and 3/8" plates shall be welded into the wall, ceiling and floor structures to provide firm securing for installed equipment (cabinets, benches, cylinders, rails, seat belts, etc.

Comply Yes_____ No _____

2.3.1. Fill Tube Enclosure:

Fuel fill tubes, fully recessed, shall be provided. The design shall be in strict compliance with FMVSS #301. Fuel caps must be flush with the module. The unleaded gasoline fuel fill shall have a locking gas cap.

Comply Yes_____ No _____

2.3.2. Stone Guards:

Aluminum treadbrite stone guards shall be located on all four lower outside corners. Stone guards shall be formed to fit the corner structure.

Comply Yes_____ No _____

2.3.3. Wheel Well Trim:

Aluminum treadbrite wheel well plates shall be provided at each rear wheel.

Comply Yes_____ No _____

2.4. Overall Module Exterior Dimensions:

Length: Shall be 168" not including rear bumper or emergency lighting.

Comply Yes_____ No _____

Width: Shall be 96" not including emergency lighting or scene lighting.

Comply Yes_____ No _____

Height: Shall be 90" not including antennae.

Comply Yes_____ No _____

2.5. Exterior Doors:
All exterior module doors shall have flush, stainless steel slam latches.

Comply Yes_____ No _____

Compartment doors shall be constructed of .100" aluminum formed to provide a 1 1/2" thick door. Entrance doors shall be constructed of .100" aluminum formed to provide a 2" thick door. Doors shall close on an automotive type weather strip providing watertight

integrity (Unigrip SD-352, or equal).

Comply Yes_____ No _____

All doors, except the generator compartment door, shall be insulated with a spray type foam. Entrance doors shall have a horizontal reinforcement plate to retain the inside grab handle. Compartment door panels shall have an inside covering attached to the outer door lip. Entry door panels shall have an inside covering attached to the outer door lip. Each entrance door shall have a 12" long, 1 1/4" diameter stainless steel grab handle. Each rear door shall have a door hold open device (Cast Products "Grabber") mounted into aluminum plate behind the exterior skin.

Comply Yes_____ No _____

2.6. Drip Rails:
There shall be a drip rail over the rear access doors and the side entry door.

Comply Yes_____ No _____

2.7. Patient Compartment Access:
Access to the patient area shall be provided by a curbside and two rear doors. The curbside door opening shall be a minimum of 74" high and 30" wide. There shall be a retractable electric step below the side entry door. The rear doors shall provide a minimum opening of 56" in height and 48" in width. The curbside and right rear doors shall have inside and outside lockable door handles. All doors shall be equipped with two point latch assemblies complying with FMVSS 206. The left door shall have an inside handle only. An aluminum sheet shall be provided at the rear entrance door sill for protection of floor covering and covered with 3M (or equal) non-skid tape. All door latches shall be bolted with self-locking nuts. In no instance will cables be allowed for linkage between the latch points and release handle. Aluminum flat bars are required for linkage between the latches and release handle.

Comply Yes_____ No _____

Door hinges shall be stainless steel hinge with minimum 3/16" stainless steel pin. The curbside door shall have a hold open device mounted at the top. Curbside doorstep shall be lined with .100" aluminum and covered with (3M or equal) non-skid tape.

Comply Yes_____ No _____

Padded vinyl covered head bumpers shall be above both doorways.

Comply Yes_____ No _____

2.8. Exterior Windows:

Curbside and rear doors shall have tinted, double-pane, sliding windows with screens. The door window area shall be a minimum 16" high. The window framing shall be extruded

aluminum with an inner and outer frame for clamping type installation.

Comply Yes_____ No _____

There shall be an opening in the front wall of the module designed to interface with the sliding window in the driver's cab for visual and audible contact between the driver and attendants.

Comply Yes_____ No _____

2.9. Exterior Compartments:

2.9.1. Compartment A: Oxygen:
Approximate I.D. is 22" wide x 58" high x 21" deep. This compartment shall be located on the driver's side and shall start at the module front wall. An oxygen cylinder shall be able to be horizontally loaded on rollers through the street side door. The access door must be vented with a stainless steel vent. A shelf shall be installed approximately 20" above the floor line. This compartment shall be lighted.

Comply Yes_____ No _____

2.9.2. Compartment B: Forward Lower Street-side:
Approximate I.D. is 55" wide x 13" high x 21" deep. This compartment shall be located directly below the floor line on the driver's side and shall start at the module front wall. The access door shall have a hold-open device to allow the door to open past a 90 degree angle. This compartment is lighted. There shall be a "THIS IS NOT A STEP" sign installed on the interior face of the door.

Comply Yes_____ No _____

2.9.3. Compartment C: Miscellaneous/Radio:
Approximate I.D. is 20" wide x 24" high x 21" deep. This compartment shall be located aft of oxygen compartment. This compartment shall be lighted.

Comply Yes_____ No _____

2.9.4. Compartment D: Electrical:
Approximate I.D. is 34" wide x 24" high x 21" deep. This compartment shall be located at the floor line of the module on the driver's side between the radio compartment and the wheel well.

Comply Yes_____ No _____

2.9.5. Compartment E: Lower Rear Street side:
Approximate I.D. is 34" wide x 35" high x 21" deep. This compartment shall be located at the extreme rear of the module on the lower driver's side. There will be a shelf located at the floor line of the module and the compartment can be configured as an outside only or with inside/ outside access above the shelf. This compartment shall be lighted.

Comply Yes_____ No _____

2.9.6. Compartment F: Horizontal Backboard Storage:
Approximate I.D. is 19" wide x 7" high x 72" deep. This compartment shall be located at the rear of the module on the curbside and sit on top of the wheel well and generator compartment (H). The door shall be located next to the rear exterior doors and be hinged at the right side (curbside).

Comply Yes_____ No _____

2.9.7. Compartment G: Generator:
Curbside behind wheel well, shall be minimum 37 1/2" wide x 23" deep x 21 1/2" high and not extend into the backboard storage compartment. The compartment must provide for manufacturer's minimum specifications unrestricted fresh air intake. The decibel level inside the module shall not exceed 75 dB when the generator is running. The exhaust pipe must exit through the door.

Comply Yes_____ No _____

2.9.8. Compartment H: Front Wall Interior/Exterior Access:
Approximate I.D. is 33 1/2" wide x 39 1/2" high x 21" deep. This compartment shall attach to the front and curbside walls and have one (1) shelf. There shall be an area below floor level approximately 31" wide x 14 1/2" high x 9 3/4" deep accessible from outside the module only. The floor shall extend to the door to provide a division between the inside and lower outside sections. The outside access door shall be hinged at the forward edge of the module. The interior shall be open for access to the equipment stored inside (there will not be an interior access door). The shelf of the compartment shall have an anti-skid mat.

Comply Yes_____ No _____

2.9.9. Compartment I: Vertical Backboard Storage:
This compartment is located curbside at the front of the module. Compartment is 74" high x 12" wide x 21" deep and shall have ribbed rubber on the floor. This compartment is lighted.

Comply Yes_____ No _____

2.9.10. Locking System:
All compartment and patient access doors shall be keyed alike.

Comply Yes_____ No _____

2.10. Interior Body Module:

2.10.1. Approximate Overall Interior Dimension:
Length: Measured from the front wall to the rear doors shall be 164". A minimum of 25" of unobstructed space at the head of the technician's seat to the forward edge of the cot shall be provided.

Comply Yes_____ No _____

Width: Shall be 93" wall to wall. The width of the compartment at the wheel well shall be a minimum of 49".

Comply Yes_____ No _____

Height: Shall be a minimum of 71" measured from floor to ceiling.

Comply Yes_____ No _____

2.10.2. Interior Body Insulation:
Interior body insulation shall be foamed-in expandable urethane applied to the roof and four (4) side walls, and applied over a rubber sound deadening material. All requirements for fire rating shall be met.

Comply Yes_____ No _____

2.10.3. Interior Floor and Covering:
Interior floor underlayment shall be a composite material consisting of two (2) pre-finished aluminum cover sheets heat-bonded to a core made of polyethylene plastic. Vinyl flooring shall extend up side-walls approximately 4” and have a smooth radius from floor to sidewall. Vinyl flooring shall be Lonseal “Lonfloor”, or equivalent. Plywood or wood products are not acceptable.

Comply Yes_____ No _____

2.10.4. Interior Trim and Lining:
Upper walls shall be covered with Fiberglass Reinforced Product (FRP). The material furnished shall be completely smooth and shall be white. The squad bench, the area from the action wall level down from the rear of the unit to the front of the unit, and the CPR seat shall be covered in stainless steel.

Comply Yes_____ No _____

2.10.5. Ceiling:
Interior ceiling shall be attached to the roof structure providing a void area for recessing LEDs and other fixtures, and allowing for easy access to wiring and coax. Ceiling shall be white in color.

Comply Yes_____ No _____

2.11. Interior Cabinets/Areas:

All dimensions as stated are approximate. Construction material shall be .100" aluminum. Vendor shall provide on the front wall of Cabinet #6, a 115 volt wall plug.

Comply Yes_____ No _____

Interior aluminum cabinets shall be finished with white powder coating. Exposed edges and corners shall be covered with padding as necessary. Metal plates welded to the wall or ceiling structures are not required in areas in which direct screw fastening to the structural frame can be accomplished. These cabinets shall be equipped with sliding poly- carbonate scratch resistant doors.

Comply Yes_____ No _____

2.11.1. Cabinet #1: Driver's Side:

Approximate I.D. shall be 34" wide x 17" high x 21" deep (this is the inside/outside part of Compartment E is needed).

Comply Yes_____ No _____

2.11.2. Cabinet #2: Driver's Side Wall/Counter top:

A false wall (45" wide x 23" high x 4" deep) shall be provided to hide radio wiring/cabling, electrical wiring, oxygen hoses, suction hoses, etc. Functions located on this wall are suction, an oxygen outlet, and a quad 115 volt outlet. There shall be a hinged aluminum panel to provide access to the area behind the false wall without removal. A counter top shall be provided that is 56” wide x 17” deep with a 1/2” lip. A sharps container shall be located at the counter top.

Comply Yes_____ No _____

2.11.3. Area #2: Driver's Side Corner:

Approximate I.D. shall be 23" wide x 23" high x 21" deep, located between cabinet #2 and #4 and on top of compartment A creating an open corner space. A mid-line shelf with a 1” lip shall be installed.

Comply Yes_____ No _____

2.11.4. Cabinet #4: Front Wall - Center:

Approximate I.D. shall be 50" wide x 24" high x 12" deep. This cabinet shall be secured to the front wall and ceiling. Two horizontal shelves shall create three 8” high spaces.

Comply Yes_____ No _____

2.11.5. Cabinet #5: Oxygen:

Approximate I.D. is 49" long x 24" wide x 15" deep with a lid. The lid shall be hinged

at the front wall. The bottom of the cabinet at the floor level shall be sealed. There will also be two openings in this area for trash cans. Two (2) waste baskets shall be provided.

Comply Yes_____ No _____

2.11.6. Cabinet #6: Front Wall - Curbside:
Approximate I.D. shall be 33" wide x 29" high x 12" deep. It has three shelves creating four equal levels of storage. It has a 115 VAC receptacle on the wall with a hole cut for access from the inside/ outside compartment below it.

Comply Yes_____ No _____

2.11.7. Cabinet #7: Waste Basket:
Approximate I.D. shall be 21" wide x 7 1/2" deep x 10" high, forward of compartment G and above the curbside wheel well. There shall be a 12" wide x 6" deep opening centered on the top to secure a wastebasket. There shall be a wastebasket provided. Bench seat padding shall not cover this area.

Comply Yes_____ No _____

2.12. Curbside Bench Seat:
The bench seat shall be approximately 74" long x 16" high from the floor x 21" wide with three (3) self-retracting seat belt sets for passenger restraint and three (3) for patient restraint. The bench seat shall be padded with 3" seamless foam bottom and 2" back cushions. All cushions shall be attached by magnets and shall be removable. No velcro or screws can be used for means of attachment.

Comply Yes_____ No _____

2.13. Driver's Side Double CPR Seat:
The CPR seat shall have a seamless foam top cushion over an aluminum base that is 40" long x 22" wide. The location of the CPR seat shall be 45" off rear wall. A 2" foam padded backrest shall be required. All cushions must be removable. No velcro or screws can be used for means of attachment. The aluminum lid of the seat shall lift to access storage approximately 42" wide x 20 1/4" deep x 7 3/4" high.

Comply Yes_____ No _____

2.14. Technician's Seat (Captain's Chair):
This chair shall be a seamless, vinyl-covered high back "Captain's Chair" without fold-down arm rests (EVS or equal). It shall be mounted on a 360 degree swivel base, be capable of adjustment forward and aft, and have a retractable seat belt. Swivel base shall lock fore and aft.

Comply Yes_____ No _____

2.15. Miscellaneous Equipment:
2.15.1. Overhead Safety Bar and Grab Handles:

A stainless steel overhead safety bar 72" long x 1 1/4" diameter shall be installed slightly off center over the stretcher. A stainless steel overhead safety bar 36" long x 1 1/4" diameter shall be installed forward of the captain's chair.

Comply Yes_____ No _____

On the inside surface of the curbside door shall be provided one 30" long x 1 1/4" diameter angled stainless grab rail. On the rear wall above the bench seat shall be provided one 12" long x 1 1/4" diameter stainless grab handle. On the inside surface of each rear door shall be provided one 12" long x 1 1/4" diameter stainless grab handle.

Comply Yes_____ No _____

2.15.2. Stretcher Fasteners:

Aluminum plates shall be welded into the floor structure to secure all stretcher fasteners and brackets using stretcher manufacturer's approved bolting means.

Comply Yes_____ No _____

Floor plates for a single position stretcher fastener shall be flush mounted in the floor of the module and provided with a watertight seal. The successful vendor will be notified which stretcher is selected to enable proper placement of brackets. All fasteners, hardware, and brackets shall be provided by the module vendor, except the cot securing antler and release bar. Stainless steel floor plates shall be provided to prevent the stretcher wheels from damaging the floor.

Comply Yes_____ No _____

2.15.3. Suction:

An electrically operated suction pump (Impact 324 system or equal) shall be provided. The complete system and installation shall be per manufacturer's instructions.

Comply Yes_____ No _____

2.15.4. IV Hangers:

Two (2) ceiling mounted, near-flush, rubber IV holders (Cast Products, or equal) with straps shall be provided. The ceiling holders shall be located between the waist and knee at both the primary and secondary patient locations.

Comply Yes_____ No _____

2.15.5. Wall Mount Supply Holders:

An acrylic EMS supply container with multiple openings (made of white acrylic backing with clear acrylic pockets) shall be provided and located fore of the CPR seat.

The container shall be mounted onto Cabinet #2 (forward of the CPR seat). Overall width shall be 11 1/2" and height shall be 21 1/2", with five (5) openings provided in

two rows. The top row contains two (2) openings and the bottom row contains three (3) openings for a total of five (5) individual openings. All openings shall be 4 1/4" high.

Comply Yes_____ No _____

A supply holder of similar design shall be mounted on the wall aft of the CPR seat, overall width shall be 17" and height shall be 24", with fourteen (14) openings provided in three rows. The top row shall contain three (3) openings, the middle row shall contain four (4) openings, and the bottom row shall contain seven (7) openings.

Comply Yes_____ No _____

2.16. Oxygen System:
The oxygen system shall consist of the following equipment that shall be installed and made ready in accordance with C.G.A. pamphlet G-4.1 and National Standards for Medical Grade Oxygen Service. All hose and tubing shall be approved for medical oxygen service with a minimum rating of not less than 150 PSI.

Comply Yes_____ No _____

Three (3) outlets shall be provided. Two (2) shall be located at the action wall and one (1) shall be located above the head end of the squad bench. All holes through which system tubing must travel shall be lined with rubber grommets. Tubing shall be covered with loom.

Comply Yes_____ No _____

2.17. Module Heating and Air Conditioning:
Heating and air conditioning shall comply with KKK-A-1822F for performance in both the driver and patient area. The system for the module shall provide total environmental temperature control through a 120VAC heating-cooling unit which can operate in ambient temperatures ranging from 0 degrees to 110 degrees F. The AC/heat unit thermostat controls shall be located at the action wall. The AC/heat unit must be installed at the rear driver's side of the module, with an exterior accesss door to allow complete change out in less than one hour.

Comply Yes_____ No _____

The patient compartment unit shall process air through a disposable air filter and then through the coil of the unit. There shall be two (2) adjustable louvers for adequate air volume and direction.

Comply Yes_____ No _____

2.17.1. Air Conditioner/Heat unit:
The module air conditioner/heat shall be a 15,000 BTU, 120VAC, self- contained air

conditioner unit with a 2.5 kW heat strip. The entire unit shall be accessed from outside the module in less than 30 minutes. It shall come with a 4 year parts and labor warranty and shall be certified for EPA 2010 requirements with 410A coolant. This unit is completely separate from the chassis factory (12 volt) air conditioner.

Comply Yes_____ No _____

2.18. Electrical Equipment:

All wiring shall be stranded copper with thermoplastic insulation and sized for amp load connected in accordance with S.A.E. standards, minimum size 14 gauge. Wires shall extend from wiring panel to a ceiling panel. Whenever possible wires shall be run in loom and where wire passes through metal panels, insulating grommets shall be provided.

Comply Yes_____ No _____

2.18.1. Connections:

Electrical connections for the body module shall be provided with screw connections in such a manner as to permit transfer of the module from one cab and chassis to another without having to cut or splice wires.

Comply Yes_____ No _____

All wiring shall be color and/or function coded and routed in high temperature conduit or loom conforming to SAE J562 as applicable. All wiring shall be located in an accessible, enclosed and protected location and kept at least six (6) inches away from exhaust system components.

Comply Yes_____ No _____

Electrical wiring and components shall not terminate in the oxygen storage compartment (A). All conduit, loom and wiring shall be secured to the body or frame with insulated metal cable straps in order to prevent sagging and movement which may result in chafing, pinching, snagging or other damage. All apertures on the module shall have grommets for passing wire to conform to SAE 1292. The module electrical panel shall be located in compartment C.

Comply Yes_____ No _____

Four (4) coaxial cables shall be installed in the ceiling raceway; two (2) shall terminate in the electrical compartment and two (2) shall terminate in the truck cab.

Comply Yes_____ No _____

2.18.2. Fuses:

All 12 volt wiring shall be fused. Fuses shall be installed near the voltage source terminal in the electrical compartment (C). All fuses and circuit breakers shall be located where they are conveniently accessible for prompt fuse replacement and/or resetting. No protective device shall be located in a manner that requires removal of any equipment to restore voltage after a voltage interruption.

Comply Yes_____ No _____

2.19. 12 Volt DC Electrical Power:

Module 12 volt busses shall receive power from either a separate 115 volt to 12 volt power converter unit powered through the generator or shore power, or from the truck 12 volt system. The 115 to 12 volt power converter shall be mounted in the electrical compartment a minimum of 4 feet above ground level when mounted on the vehicle. The power converter shall be a regulated, filtered, continuous duty, electronic 100 amp device @ 13.3V or equal. The power converter shall receive its 115 volt power from either the generator installed in the module or from activation of the shore power circuit. However, if shore power is activated, the generator output must be automatically disconnected.

Comply Yes_____ No _____

In the event of failure of the generator unit, the 12 volt power source for the module electrical systems shall be switched from the power converter to the vehicle battery. This power source change shall be accomplished automatically at the instant power is lost from the generator. The 12 volt power converter unit must have current limiting and over voltage protection with a means of adjusting the voltage level as required.

Comply Yes_____ No _____

All 12 volt wiring shall be color and/or function coded in accordance with a wiring diagram that shall be installed on the inside of the electrical compartment (C) door. An example on how to troubleshoot each 12 volt circuit shall be shown on the diagram. A labeled circuit panel is to be supplied in the electrical compartment. Relays rated at 75 amps with screw connection terminals shall be used for the individual 12 volt circuits. NO EXCEPTIONS.

Comply Yes_____ No _____

2.20. 115 Volt AC Circuits:

Each 115 volt circuit will be protected by a minimum 15 amp breaker.

Comply Yes_____ No _____

All 115 volt wiring will be done per National Electrical Codes. The 115 volt wiring from the generator and shore power line shall be minimum 10 gauge. The 115 volt wiring for all individual circuits will be minimum 14 gauge.

Comply Yes_____ No _____

Four 115 volt circuits in the breaker panel shall provide power for:
1) The module 115 volt to 12 volt regulated power converter
2) The module air conditioning/heater unit
3) The module 115 volt receptacles
4) The module 115 volt side scene lights

Comply Yes_____ No _____

In order to maintain minimum module emergency functions in the event of a generator failure, at least one (1) 70 amp solenoid or relay is required which will automatically transfer power from the chassis alternator to the module if the generator is not providing 115 volts. This solenoid or relay shall be sized to carry the load of all warning lights, interior lights, and electric suction.

2.20.1. Battery charger:

The module shall have a 30 amp, 115 volt, automatic cut off battery charger “Intelli-Power, model #PD9130A.” The battery charger will be powered off shore power.

Comply Yes_____ No _____

2.21. Shore Power:

The module shall have a shore power connection through a 30 amp recessed male receptacle located behind the driver’s seat on the front outside face of the module. A flip-up rain-tight cover shall be provided. With shore power activated, selected functions shall be available while the module is parked and the generator is off. The mating female receptacle shall be provided.

Comply Yes_____ No _____

2.22. Module Engine/Generator:

The generator shall provide the primary source of electrical power for all module functions, including, but not limited to, all exterior emergency lights, interior lights, air conditioning, heating, suction, and load lights.

Comply Yes_____ No _____

In the event the generator should fail, electrical power shall automatically switch back to

the cab/chassis alternator system thereby providing 12 volt power for emergency lighting, interior module lights, and suction.

Comply Yes_____ No _____

The generator shall be either an Onan "Commercial 5.5 HGJAD-2138B", or latest model. The generator shall be capable of being individually started at both the generator compartment (G) and the driver's console. The generator shall be installed, plumbed, and wired per manufacturer's instructions.

Comply Yes_____ No _____

The connection from the generator to the module shall be through a locking 30 amp connector.

Comply Yes_____ No _____

2.22.1. Exhaust System:

The exhaust system for the generator shall consist of heavy wall exhaust pipe mounted to the engine and shall extend outside through the generator compartment door. The fresh air intake and exhaust air are to be designed per manufacturer's specifications. Nothing shall obstruct these air passages.

Comply Yes_____ No _____

2.22.2. Fuel System:

Fuel shall be supplied from a certified auxiliary 9 gallon tank mounted between the frame rails of the chassis.

Comply Yes_____ No _____

2.23. Lighting Equipment; Interior and Exterior:

Ten (10) flush mounted interior LED ceiling lights shall be installed in the ceiling of the module. These lights are to be controlled by switches at the action wall and at the console.

Comply Yes_____ No _____

LED clearance lights shall be mounted on all upper corners of the module in addition to the factory combination reflector/clearance lights.

Comply Yes_____ No _____

One (1) 250 watt, 115 volt quartz halogen scene light shall be installed on each side of the module. Two (2) 12 volt halogen load lights shall be installed at the rear of the module.

Comply Yes_____ No _____

2.24. Emergency Lighting:

There shall be eight (8) Whelen M6 fixtures located on the upper corners of the module. There shall also be five (5) M6 fixtures on the front of the module in lieu of a light bar as well as three (3) M6 fixtures on the rear of the module. One (1) M6 fixture shall be located above each wheel well. The four (4) grille and intersect lights shall be M4 fixtures. All LEDs except the grille and intersects shall have a chrome flange.

Comply Yes_____ No _____

2.25. Paint:

The paint system shall be acrylic urethane applied per manufacturer's specifications for raw aluminum substrate. Paint color shall be gloss white. Systems such as Sherwin-Williams, PPG, Sikkens, etc. shall be acceptable.

Comply Yes_____ No _____

2.26. Striping and Lettering:

The successful vendor shall stripe and letter the unit with 3M reflective material to match the fleet of_____. Striping and lettering pictures to be furnished upon request.

Comply Yes_____ No _____

2.27. Fire Extinguisher:

Vendor shall supply one (1) fire extinguisher, ABC dry chemical, multipurpose, 5 lb. in a location to be determined.

Comply Yes_____ No _____

2.28. Rear Step/Bumper:

A full width rear step/bumper shall be fabricated from “grip strut” aluminum, and hinged to allow lifting. The rear step/bumper shall support a weight of 500 lbs. The rear step/bumper shall be assembled with three (3) independent pieces, two outer pieces (e.g., cast products) and one hinged center. A full width kick plate shall be provided below the rear door opening. The bottom of the bumper shall not extend below the module. The bumper shall be bolted to aluminum plated welded into the structure.

Comply Yes_____ No _____

Ambulance and Emergency Vehicles, Equipment and Accessories

1.1. Vehicle: Type III, 12' Chevrolet G3500

1.11 Chevrolet G3500 Cutaway Gas Chassis:

Gross Vehicle Weight Rating:	12,300#.
Wheel base:	139 inches.
Cab to Axle:	80 inches.
Engine:	6.0L Vortec Gasoline.
Axles:	Rear axle: single reduction, 8600#. 3.73 ratio, dual wheels, Front axle: 4300#, stabilizer bar
Shock Absorbers:	Factory front and rear
Tires:	Steel radials. Seven all-season tires.
Steel	wheels.
Wheel Covers:	Chrome plastic wheel simulators
Brakes:	Hydraulic, self-adjusting with power booster
Steering:	Power steering
Battery, Ignition:	Factory dual, maintenance free
Alternator:	Factory single
Safety Belts:	Factory seat belts
Headlights:	Commercial standard
Cab Trim:	Deluxe interior/exterior trim package
Bumpers:	Standard factory chrome front bumper
Turn Signals:	Self-canceling type for front and rear commercial standard lights
Fuel Tank:	Factory tank (s)
Dash Instruments:	Factory gauges
Windshield Wipers:	Dual intermittent with washers
Air Conditioner:	Factory air conditioner
Heater:	Factory heater
Cab Interior:	Manufacturer's deluxe (trim level) interior with factory bucket seats and rubberized floor covering
Rear view mirrors:	Standard rear view mirror
Exterior Mirrors:	Powered, outside wide-stance (Velvac)

Comply_____Yes_____No

1.1.2 Additions to Cab/Chassis

An aluminum, powder coated console shall be provided to house switches for emergency lights, scene lights, module interior lights, rear load lights, and other switchable items. Door and compartment open warning lights, one (1) 200 watt siren, the generator start/stop switch, the digital generator hour meter, and the generator fuel gauge shall also be at the console.

Comply_____Yes_____No

One hand held 100,000 CP spotlight with momentary switch, coiled cord and safety shroud shall be provided. Two (2) 100 watt speakers, two (2) red LED grille lights and two (2) red LED intersection lights shall be provided and installed on the factory grille and front fenders. A back-up alarm and mud flaps shall also be provided.

Comply_____Yes_____No

2.1. Module Specification Scope:

This specification describes an advanced module where the electrical and environmental systems operate independently of the cab-chassis electrical and environmental systems.

Comply_____Yes_____No

2.2. Mounting:

The module shall be constructed and fully mounted by the successful bidder onto a chassis that will be furnished by the bidder, unless otherwise noted. The module shall be mounted to the truck chassis at ten (10) tie down locations - five each side of the frame. Tie down locations shall comply with the chassis manufacturer's recommendations. Mounting plates shall be 3/8" x 4" x 10" steel plates bolted to the module base frame, then bolted to the chassis rails with 5/8" grade 8 bolts (minimum 4 bolts per tie-down location). This mounting system conforms to the chassis manufacturer’s recommendation for mounting second unit bodies (modules) weighing over 1800 lb. The module shall include four (4) upper lift strength plates (1/2" aluminum plate welded to the structural frame) which shall support lifting the module during mounting by a 4 point lift strap.

Comply_____Yes_____No

2.3. Module Construction:

The base frame shall be constructed of 3" x 1 1/2" x .188" wall tubing and 3" x .188" wall channel. In order to limit unnecessary weight and to maintain structural strength, the driver's side, passenger side, front walls, and roof structure shall be 1 1/2" x 2" x .125" tubing on 14" centers. Double tube members shall be located at all vertical corners and single tube members shall be located at all horizontal corners eliminating void areas in the

corners and thereby increasing structural strength. All structural members shall have full welds at each 90˚ joint. The rear wall structure shall be 2" x 2 1/2" x .125" tubing.

Comply_____Yes_____No

The roof and side body panels shall be minimum .080 sheet aluminum attached firmly by VHB tape (3M or equal). Short radius trim shall cover all edges. The body shall be of sufficient strength to pass the static load test referenced in KKK-A-1822F.

Comply_____Yes_____No

Aluminum 1/4" and 3/8" plates shall be welded to the walls or ceiling structures to provide firm securing for installed equipment (cabinets, benches, cylinders, rails, seat belts, etc.).

Comply_____Yes_____No

2.3.1. Fill Tube Enclosure:

Fuel fill tubes, fully recessed, shall be provided. The design shall be in strict compliance with FMVSS #301. Fuel caps must be flush with the module. The unleaded gasoline fuel fill shall have a locking gas cap.

Comply_____Yes_____No

2.3.2. Stone Guards:

Aluminum treadbrite stone guards shall be located on all four lower outside corners. Stone guards shall be formed to fit the corner structure.

Comply_____Yes_____No

2.3.3. Wheel Well Trim:

Aluminum treadbrite wheel well plates shall be provided at each rear wheel.

Comply_____Yes_____No

2.4. Overall Module Exterior Dimensions:

Length: Shall be 144" not including rear bumper or emergency lighting.

Comply_____Yes_____No

Width: Shall be 96" not including emergency lighting or scene lighting.

Comply_____Yes_____No

Height: Shall be 86" not including antennae.

Comply_____Yes_____No

2.5. Exterior Doors:

All exterior module doors shall have flush, stainless steel slam latches.

Comply_____Yes_____No

Compartment doors shall be constructed of .100" aluminum formed to provide a 1 1/2" thick door. Entrance doors shall be constructed of .100" aluminum formed to provide a 2" thick door. Doors shall close on an automotive type weather strip providing watertight integrity (Unigrip SD-352, or equal).

Comply_____Yes_____No

All doors, except that for the generator, shall be insulated with a spray type foam. Entrance doors shall have a horizontal reinforcement plate to retain the inside grab handle. Compartment door panels shall have an inside covering attached to the outer door lip. Entry door panels shall have an inside covering attached to the outer door lip. Each entrance door shall have a 12" long, 1 1/4" diameter stainless steel grab handle. Each rear door shall have a door hold open device (Cast Products "Grabber") mounted into aluminum plate behind the exterior skin.

Comply_____Yes_____No

2.6. Drip Rails:

There shall be a drip rail over the rear access doors and the side entry door.

Comply_____Yes_____No

2.7. Patient Compartment Access:

Access to the patient area shall be provided by a curbside and two rear doors. The curbside door opening shall be a minimum of 74" high and 30" wide. The rear doors shall provide a minimum opening of 56" in height and 48" in width. The curbside and right rear doors shall have inside and outside lockable door handles. All doors shall be equipped with two point latch assemblies complying with FMVSS 206. The left door shall have an inside handle only. An aluminum sheet shall be provided at the rear entrance door sill for protection of floor covering and covered with 3M (or equal) non- skid tape. All door latches shall be bolted with self-locking nuts. In no instance will cables be allowed for linkage between the latch points and release handle. Aluminum flat bars are required for linkage between the latches and release handle.

Comply_____Yes_____No

Door hinges shall be stainless steel hinge with minimum 3/16" stainless steel pin. The curbside door shall have a hold open device mounted at the top. Curbside doorstep shall be lined with .100" aluminum and covered with (3M or equal) non-skid tape.

Comply_____Yes_____No

Padded vinyl covered head bumpers shall be above both doorways.

Comply_____Yes_____No

2.8. Exterior Windows:

Curbside and rear doors shall have tinted double pane sliding windows with screens. The door window area shall be a minimum 16" high. The window framing shall be extruded aluminum with an inner and outer frame for clamping type installation.

Comply_____Yes_____No

There shall be an opening in the front wall of the module designed to interface with the sliding window in the driver's cab for visual and audible contact between the driver and attendants.

Comply_____Yes_____No

2.9. Exterior Compartments:

2.9.1. Compartment A: Oxygen:

Approximate I.D. is 19 1/2" wide X 42 1/2" high x 21" deep. This compartment shall be located at the floor line of the module on the driver's side and shall start at the module front wall. An oxygen cylinder shall be able to be horizontally loaded through the street side door. The access door must be vented with a stainless steel vent. A shelf shall be installed approximately 20" above floor the line. This compartment shall be lighted.

Comply_____Yes_____No

2.9.2. Compartment B: Forward Lower Street-side:

Approximate I.D. is 55 1/2" wide x 11" high x 21" deep. This compartment shall be located directly below the floor line on the driver's side and shall start at the module front wall. The access door shall have a hold-open device to allow the door to open past a 90 degree angle. This compartment is lighted. There shall be a "THIS IS NOT A STEP" sign installed on the interior face of the door.

Comply_____Yes_____No

2.9.3. Compartment C: Electrical:

Approximate I.D. is 34" wide x 23 1/2" high x 21" deep. This compartment shall be located at the floor line of the module on the driver's side between the oxygen compartment and the wheel well.

Comply_____Yes_____No

2.9.4. Compartment D: Miscellaneous/Radio:

Approximate I.D. is 17 1/2" wide x 14 1/2" high x 21" deep. This compartment shall be located aft of the electrical compartment and above the wheel well.

Comply_____Yes_____No

2.9.5. Compartment E: Lower Rear Streetside:

Approximate I.D. is 34 1/2" wide x 34 1/2" high x 21" deep. This compartment shall be located at the extreme rear of the module on the lower driver's side. There will be a shelf located at the floor line of the module and the compartment can be configured as an outside only or with inside/outside access above the shelf. This compartment shall be lighted.

Comply_____Yes_____No

2.9.6. Compartment F: Backboards:

Approximate I.D. is 20 1/2" wide x 9" high x 75" deep. This compartment shall be located at the rear of the module on the curbside and sit on top of the wheel well and generator compartment (H). The door shall be located next to the rear exterior doors and be hinged at the right side (curbside).

Comply_____Yes_____No

2.9.7. Compartment G: Generator:

Curbside behind wheel well, shall be minimum 37 1/2" wide x 21" deep x 21 1/2" high and not extend into the backboard storage compartment. The compartment must provide for manufacturer's minimum specifications for unrestricted fresh air intake. The decibel level inside the module shall not exceed 75 dB when the generator is running. The exhaust pipe must exit through the door.

Comply_____Yes_____No

2.9.8. Compartment H: Front Wall Interior/Exterior Access:

Approximate I.D. is 25" wide x 43" high x 34 1/2" deep. This compartment shall attach to the front and curbside walls and have one (1) shelf approximately 22" off the module floor. There shall be an area below floor level approximately 22 1/2" wide x 14 1/2" high x 21" deep accessible from outside the module only. The floor shall extend to the door to provide a division between the inside and lower outside sections. The outside access door shall be hinged at the forward edge of the module. The interior shall be open for access to the equipment stored inside (there will not be an interior access door). The shelf of the compartment shall have an anti-skid mat.

Comply_____Yes_____No

2.9.9. Locking System:

All compartment and patient access doors shall be keyed alike.

Comply_____Yes_____No

2.10. Interior Body Module:

2.10.1. Approximate Overall Interior Dimension:

Length: Measured from the front wall to the rear doors shall be 140". A minimum of 25" of unobstructed space at the head of the technician's seat to the forward edge of the cot shall be provided.

Comply_____Yes_____No

Width: Shall be 93" wall to wall. The width of the compartment at the wheel well shall be a minimum of 49".

Comply_____Yes_____No

Height: Shall be a minimum of 67" measured from floor to ceiling.

Comply_____Yes_____No

2.10.2. Interior Body Insulation:

Interior body insulation shall be a spray type foam applied to the roof and four (4) side walls. All requirements for self-extinguishment shall be met.

Comply_____Yes_____No

2.10.3. Interior Floor and Covering:

Interior floor underlayment shall be a composite material consisting of two
(2) pre-finished aluminum cover sheets heat-bonded to a core made of polyethylene plastic. Vinyl flooring shall extend up side-walls approximately 4” and have a smooth radius from floor to sidewall. Vinyl flooring shall be Lonseal “Lonfloor”, or equivalent. Plywood or wood products are not acceptable.

Comply_____Yes_____No

2.10.4. Interior Trim and Lining:

Upper walls shall be covered with Fiberglass Reinforced Product (FRP). The material furnished shall be completely smooth and shall be white. The squad bench, the area from the action wall level down from the rear of the unit to the front of the unit, and the CPR seat shall be covered in stainless steel.

Comply_____Yes_____No

2.10.5. Ceiling:

Interior ceiling shall be attached to the roof structure providing a void area for recessing LEDs and other fixtures, and allowing for easy access to wiring and coax. Ceiling shall be white in color.

Comply_____Yes_____No

2.11. Interior Cabinets/Areas:

All dimensions as stated are approximate. Construction material shall be .100" aluminum. Vendor shall provide on the front wall of Compartment H, a 115 volt wall plug.

Comply_____Yes_____No

Interior aluminum cabinets shall be finished with white powder coating. Exposed edges and corners shall be covered with padding as necessary. Metal plates welded to the wall or ceiling structures are not required in areas in which direct screw fastening to the structural frame can be accomplished. These cabinets shall be equipped with sliding poly- carbonate scratch resistant doors.

Comply_____Yes_____No

2.11.1. Cabinet #1: Driver's Side:

Approximate I.D. shall be 34" wide x 17" high x 21" deep (this is the inside/outside part of Compartment E if needed).

Comply_____Yes_____No

2.11.2. Cabinet #2: Driver's Side Wall:

Approximate I.D. shall be 48" wide x 24" high x 12" deep, located directly above the action wall (Area #4) and is approximately 21" aft of the front wall. Two (2) horizontal shelves shall divide the cabinet to create three 8" high spaces.

Comply_____Yes_____No

2.11.3. Area #3: Driver's Side Corner:

Approximate I.D. shall be 21" wide x 24" high x 21" deep, located between cabinet #2 and #5 and on top of compartment (A) creating an open corner space. A mid-line shelf with a 1" lip shall be installed.

Comply_____Yes_____No

2.11.4. Area #4: Driver's Side Action Wall/Counter Top:

A false wall (45" wide x 19" high x 4" deep) shall be provided to hide radio wiring/cabling, electrical wiring, oxygen hoses, suction hoses, etc. Functions located on this wall are suction, dual oxygen outlets, and a quad 115 volt outlet. There shall be a hinged aluminum panel to provide access to the area behind the false wall without removal. A powder coated aluminum counter top shall be provided that is 56" wide x 17" deep with a 1/2" lip. A sharps container shall be located at the counter top.

Comply_____Yes_____No

2.11.5. Cabinet #5: Front Wall - Center:

Approximate I.D. shall be 35" wide x 24" high x 12" deep. This cabinet shall be secured to

the front wall and is adjacent to cabinet #6. Two (2) horizontal shelves shall create three 8" high spaces.

Comply_____Yes_____No

2.11.6. Cabinet #6: Front Wall - Curbside:

Approximate I.D. shall be 35" wide x 24" high x 12" deep. This cabinet shall be secured to the front wall, ceiling and compartment H. Two (2) horizontal shelves shall create three 8" high spaces.

Comply_____Yes_____No

2.11.7. Cabinet #7: Oxygen:

Approximate I.D. shall be 36" wide x 16" high x 15" deep with a lid. The lid shall be hinged at the front wall. The bottom of the cabinet at the floor level shall be sealed.

Comply_____Yes_____No

2.11.8. Cabinet #8: Waste Basket:

Approximate I.D. shall be 21" wide x 7 1/2" deep x 10" high, forward of compartment G and the curbside wheel well. There shall be a 12" wide x 6" deep opening centered on the top to secure a wastebasket. There shall be a wastebasket provided. Bench seat padding shall not cover this area.

Comply_____Yes_____No

2.12. Curbside Bench Seat:

The bench seat shall be approximately 74" long x 16" high from the floor x 21" wide with three (3) self-retracting seat belt sets for passenger restraint and three (3) for patient restraint. The bench seat shall be padded with 3" seamless foam bottom and 2" back cushions. All cushions shall be attached by magnets and shall be removable. No velcro or screws can be used for means of attachment.

Comply_____Yes_____No

2.13. Driver's Side CPR Seat:

The CPR seat shall have a seamless foam top cushion over an aluminum base that is 22" long x 18" wide. The location of the seat shall be 41" off rear wall. A 2" foam padded backrest shall be required. The lid of the seat shall lift to access storage.

Comply_____Yes_____No

2.14. Technician's Seat (Captain's Chair):

This chair shall be a seamless, vinyl-covered high back "Captain's Chair" without fold-down arm rests (EVS or equal). It shall be mounted on a 360 degree swivel base, be capable of adjustment forward and aft, and have a retractable seat belt. Swivel base shall lock fore and aft.

Comply_____Yes_____No

2.15. Miscellaneous Equipment:

2.15.1. Overhead Safety Bar and Grab Handles:

A stainless steel overhead safety bar 72" long x 1 1/4" diameter shall be installed slightly off center towards the driver's side over the stretcher.

Comply_____Yes_____No

On the inside surface of the curbside door shall be provided one 30" long x 1 1/4" diameter angled stainless grab rail. On the rear wall above the bench seat shall be provided one 12" long x 1 1/4" diameter stainless grab handle. On the inside surface of each rear door shall be provided one 12" long x 1 1/4" diameter stainless grab handle.

Comply_____Yes_____No

2.15.2. Stretcher Fasteners:

Aluminum plates shall be welded into the floor structure to secure all stretcher fasteners and brackets using stretcher manufacturer's approved bolting means.

Comply_____Yes_____No

Floor plates for a single position stretcher fastener shall be flush mounted in the floor of the module and provided with a watertight seal. The successful vendor will be notified which stretcher is selected to enable proper placement of brackets. All fasteners, hardware, and brackets shall be provided by the module vendor, except the cot securing antler and release bar. Stainless steel floor plates shall be provided to prevent the stretcher wheels from damaging the floor.

Comply_____Yes_____No

2.15.3. Suction:

An electrically operated suction pump (Impact 324 system or equal) shall be provided. The complete system and installation shall be per manufacturer's instructions.

Comply_____Yes_____No

2.15.4. IV Hangers:

Two (2) ceiling mounted, near-flush, rubber IV holders (Cast Products, or equal) with straps shall be provided. The ceiling holders shall be located between the waist and knee at both the primary and secondary patient locations.

Comply_____Yes_____No

2.15.5. Wall Mount Supply Holders:

An acrylic EMS supply container with multiple openings (made of white acrylic backing with clear acrylic pockets) shall be provided and located fore of the CPR seat.

The container shall be mounted onto Cabinet #2 (forward of the CPR seat). Overall width shall be 11 1/2" and height shall be 21 1/2", with five (5) openings provided in two rows. The top row contains two (2) openings and the bottom row contains three (3) openings for a total of five (5) individual openings. All openings shall be 4 1/4" high.

Comply_____Yes_____No

A supply holder of similar design shall be mounted on the wall aft of the CPR seat, overall width shall be 17" and height shall be 24", with fourteen (14) openings provided in three rows. The top row shall contain three (3) openings, the middle row shall contain four (4) openings, and the bottom row shall contain seven (7) openings.

Comply_____Yes_____No

2.16. Oxygen System:

The oxygen system shall consist of the following equipment that shall be installed and made ready in accordance with C.G.A. pamphlet G-4.1 and National Standards for Medical Grade Oxygen Service. All hose and tubing shall be approved for medical oxygen service with a minimum rating of not less than 150 PSI.

Comply_____Yes_____No

Three (3) outlets shall be provided. Two (2) shall be located at the action wall and one (1) shall be located above the head end of the squad bench. All holes through which system tubing must travel shall be lined with rubber grommets. Tubing shall be covered with loom.

Comply_____Yes_____No

2.17. Module Heating and Air Conditioning:

Heating and air conditioning shall comply with KKK-A-1822F for performance in both the driver and patient area. The system for the module shall provide total environmental temperature control through a 120VAC heating-cooling unit which can operate in ambient temperatures ranging from 0 degrees to 110 degrees F. The AC/heat unit thermostat controls shall be located above the return air grille. The AC/heat unit must be installed at the rear driver's side of the module.

Comply_____Yes_____No

The patient compartment unit shall process air through a disposable air filter and then through the coil of the unit. There shall be two (2) adjustable louvers for adequate air volume and direction.

Comply_____Yes_____No

2.17.1. Air Conditioner/Heat unit:

The module air conditioner/heat shall be a 15,000 BTU, 120VAC, self- contained air conditioner unit with a 2.5 kW heat strip. The entire unit shall be accessed from outside the module in less than 30 minutes. It shall come with a 4 year parts and labor warranty and shall be certified for EPA 2010 requirements with 410A coolant. This unit is completely separate from the chassis factory (12 volt) air conditioner.

Comply_____Yes_____No

2.18. Electrical Equipment:

All wiring shall be stranded copper with thermoplastic insulation and sized for amp load connected in accordance with S.A.E. standards, minimum size 14 gauge. Wires shall extend from wiring panel to a ceiling panel. Whenever possible wires shall be run in loom and where wire passes through metal panels, insulating grommets shall be provided.

2.18.1. Connections:
Electrical connections for the body module shall be provided with screw connections in such a manner as to permit transfer of the module from one cab and chassis to another without having to cut or splice wires.

Comply_____Yes_____No

All wiring shall be color and/or function coded and routed in high temperature conduit or loom conforming to SAE J562 as applicable. All wiring shall be located in an accessible, enclosed and protected location and kept at least six (6) inches away from exhaust system components.

Comply_____Yes_____No

Electrical wiring and components shall not terminate in the oxygen storage compartment (A). All conduit, loom and wiring shall be secured to the body or frame with insulated metal cable straps in order to prevent sagging and movement which may result in chafing, pinching, snagging or other damage. All apertures on the module shall have grommets for passing wire to conform to SAE 1292. The module electrical panel shall be located in compartment C.

Four (4) coaxial cables shall be installed in the ceiling raceway; two (2) shall terminate in the electrical compartment and two (2) shall terminate in the truck cab.

Comply_____Yes_____No

2.18.2. Fuses:

All 12 volt wiring shall be fused. Fuses shall be installed near the voltage source terminal in the electrical compartment (C). All fuses and circuit breakers shall be located where they are conveniently accessible for prompt fuse replacement and/or resetting. No protective device shall be located in a manner that requires removal of any equipment to restore voltage after a voltage interruption.

Comply_____Yes_____No

2.19. 12 Volt DC Electrical Power:

Module 12 volt busses shall receive power from either a separate 115 volt to 12 volt power converter unit powered through the generator or shore power, or from the truck 12 volt system. The 115 to 12 volt power converter shall be mounted in the electrical compartment a minimum of 4 feet above ground level when mounted on the vehicle. The power converter shall be a regulated, filtered, continuous duty, electronic 100 amp device @ 13.3V or equal. The power converter shall receive its 115 volt power from either the generator installed in the module or from activation of the shore power circuit. However, if shore power is activated, the generator must be automatically disconnected.

Comply_____Yes_____No

In the event of failure of the generator unit, the 12 volt power source for the module electrical systems shall be switched from the power converter to the vehicle battery. This power source change shall be accomplished automatically at the instant power is lost from the generator. The 12 volt power converter unit must have current limiting and over voltage protection with a means of adjusting the voltage level as required.

Comply_____Yes_____No

All 12 volt wiring shall be color and/or function coded in accordance with a wiring diagram that shall be installed on the inside of the electrical compartment (C) door. An example on how to troubleshoot each 12 volt circuit shall be shown on the diagram. A labeled circuit panel is to be supplied in the electrical compartment. Relays rated at 75 amps with screw connection terminals shall be used for the individual 12 volt circuits. NO EXCEPTIONS.

Comply_____Yes_____No

2.20. 115 Volt AC Circuits:

Each 115 volt circuit will be protected by a minimum 15 amp breaker.

Comply_____Yes_____No

All 115 volt wiring will be done per National Electrical Codes. The 115 volt wiring from the generator and shore power line shall be minimum 10 gauge. The 115 volt wiring for all individual circuits will be minimum 14 gauge.

Comply_____Yes_____No

Four 115 volt circuits in the breaker panel shall provide power for:

1) The module 115 volt to 12 volt regulated power converter
2) The module air conditioning/heater unit
3) The module 115 volt receptacles
4) The module 115 volt side scene lights

Comply_____Yes_____No

In order to maintain minimum module emergency functions in the event of a generator failure, at least one (1) 70 amp solenoid or relay is required which will automatically transfer power from the chassis alternator to the module if the generator is not providing

115 volts. This solenoid or relay shall be sized to carry the load of all warning lights, interior lights, and electric suction.

Comply_____Yes_____No

2.20.1. Battery charger:

The module shall have a 30 amp, 115 volt, automatic cut off battery charger “Intelli-Power, model #PD9130A.” The battery charger will be powered off shore power.

Comply_____Yes_____No

2.21. Shore Power:

The module shall have a shore power connection through a 30 amp recessed male receptacle located behind the driver’s seat on the front outside face of the module. A flip-up rain-tight cover shall be provided. With shore power activated, selected functions shall be available while the module is parked and the generator is off. The mating female receptacle shall be provided.

Comply_____Yes_____No

2.22. Module Engine/Generator:

The generator shall provide the primary source of electrical power for all module functions, including, but not limited to, all exterior emergency lights, interior lights, air conditioning, heating, suction, and load lights.

Comply_____Yes_____No

In the event the generator should fail, electrical power shall automatically switch back to the cab/chassis alternator system thereby providing 12 volt power for emergency lighting, interior module lights, and suction.

Comply_____Yes_____No

The generator shall be either an Onan "Commercial 5.5 HGJAD-2138B", or latest model. The generator shall be capable of being individually started at both the generator compartment (G) and the driver’s console. The generator shall be installed, plumbed, and wired per manufacturer’s instructions.

Comply_____Yes_____No

The connection from the generator to the module shall be through a locking 30 amp connector.

Comply_____Yes_____No

2.22.1. Exhaust System:

The exhaust system for the generator shall consist of heavy wall exhaust pipe mounted to

the engine and shall extend outside through the generator compartment door. The fresh air intake and exhaust air are to be designed per manufacturer's specifications. Nothing shall obstruct these air passages.

Comply_____Yes_____No

2.22.2. Fuel System:

Fuel shall be supplied from a certified auxiliary 9 gallon tank mounted between the frame rails of the chassis.

Comply_____Yes_____No

2.23. Lighting Equipment; Interior and Exterior:

Eight (8) flush mounted interior LED ceiling lights shall be installed in the ceiling of the module. These lights are to be controlled by switches at the action wall and at the console.

Comply_____Yes_____No

LED clearance lights shall be mounted on all upper corners of the module in addition to the factory combination reflector/clearance lights.

Comply_____Yes_____No

One (1) 250 watt, 115 volt quartz halogen scene light shall be installed on each side of the module. Two (2) 12 volt halogen load lights shall be installed at the rear of the module.

Comply_____Yes_____No

2.24. Emergency Lighting:

There shall be eight (8) 6"x4" LED fixtures located on the upper corners of the module. There shall also be five (5) 6"x4" LED fixtures on the front of the module in lieu of a light bar as well as three (3) 6"x4" LED fixtures on the rear of the module. One (1) 6"x4" LED fixture shall be located above each wheel well. The four (4) grille and intersect lights shall be 4"x3" LED fixtures. All LEDs except the grille and intersects shall have a chrome flange.

Comply_____Yes_____No

2.25. Paint:

The paint system shall be acrylic urethane applied per manufacturer's specifications for raw aluminum substrate. Paint color shall be gloss white. Systems such as Sherwin-Williams, PPG, Sikkens, etc. shall be acceptable.

Comply_____Yes_____No

2.26. Striping and Lettering:

The successful vendor shall stripe and letter the unit with 3M reflective material to match the fleet of_____. Striping and lettering pictures to be furnished upon request.

Comply_____Yes_____No

2.27. Fire Extinguisher:

Vendor shall supply one (1) fire extinguisher, ABC dry chemical, multipurpose, 5 lb. in a location to be determined.

Comply_____Yes_____No

2.28. Rear Step/Bumper:

A full width, three piece rear step/bumper shall be fabricated from “grip strut” aluminum, minimum seven (7) inches deep with a powder coated metallic silver finish. The bumper shall support a weight of 500 lb. without flexing. The outer ends of the bumper shall be fabricated out of .188 aluminum plate. A full width kick plate shall be provided below the rear door opening. The bottom of the bumper shall not extend below the module. The bumper shall be bolted to aluminum plate welded into the structure.

Comply_____Yes_____No

Ambulance and Emergency Vehicles, Equipment and Accessories

1.1. Vehicle: Type III, 14' Chevrolet G4500

1.11 Chevrolet G4500 Cutaway Gas Chassis:

Gross Vehicle Weight Rating:	14,200#
Wheel base:	159 inches.
Cab to Axle:	108 inches.
Engine:	6.0L V8 Gasoline.
Transmission:	GM 6-speed HD transmission
Axles:	Rear axle: single reduction, 9600#. 4.10 ratio, dual wheels, Front axle: 4600#, stabilizer bar.
Shock Absorbers:	Factory front and rear.
Tires:	Steel radials. Seven tires. Steel wheels.
Wheel Covers:	Trim rings. Chrome.
Brakes:	Hydraulic, self-adjusting with power booster.
Steering:	Power steering.
Battery, Ignition:	Factory HD 770 CCA.
Alternator:	Factory single.
Safety Belts:	Factory seat belts.
Headlights:	Commercial standard.
Cab Trim:	Deluxe exterior trim package.
Bumpers:	Standard factory chrome front bumper.
Turn Signals:	Self-canceling type for front and rear commercial standard lights.
Fuel Tank:	Factory tank 57 gal.(s).
Dash Instruments:	Factory gauges.
Windshield Wipers:	Dual intermittent with washers.
Air Conditioner:	Factory air conditioner.
Heater:	Factory heater.
Cab Interior:	Manufacturer's deluxe (trim level) interior with factory bucket seats and rubberized floor covering.
Rear view mirrors:	Standard rear view mirror.
Exterior Mirrors:	Powered, wide-stance (Velvac).

Comply_____Yes_____No

1.1.2 Additions to Cab/Chassis

An aluminum, powder coated console shall be provided to house switches for emergency lights, scene lights, module interior lights, rear load lights, and other switchable items. Door and compartment open warning lights, one (1) 200 watt siren, the generator start/stop switch, the digital generator hour meter, and the generator fuel gauge shall also be at the console.

Comply_____Yes_____No

One hand held 100,000 CP spotlight with momentary switch, coiled cord and safety shroud shall be provided. Two (2) 100 watt speakers, two (2) red LED grille lights and two (2) red LED intersection lights shall be provided and installed on the factory grille and front fenders. A back-up alarm and mud flaps shall also be provided.

Comply_____Yes_____No

2.1. Module Specification Scope:

This specification describes an advanced module where the electrical and environmental systems operate independently of the cab-chassis electrical and environmental systems.

Comply_____Yes_____No

2.2. Mounting:

The module shall be constructed and fully mounted by the successful bidder onto a chassis that will be furnished by the bidder, unless otherwise noted. The module shall be mounted to the truck chassis at ten (10) tie down locations - five each side of the frame. Tie down locations shall comply with the chassis manufacturer's recommendations. Mounting plates shall be 3/8" x 4" x 10" steel plates bolted to the module base frame, then bolted to the chassis rails with 5/8" grade 8 bolts (minimum 4 bolts per tie-down location). This mounting system conforms to the chassis manufacturer’s recommendation for mounting second unit bodies (modules) weighing over 1800 lb. The module shall include four (4) upper lift strength plates (1/2" aluminum plate welded to the structural frame) which shall support lifting the module during mounting by a 4 point lift strap.

Comply_____Yes_____No

2.3. Module Construction:

The base frame shall be constructed of 3" x 1 1/2" x .188" wall tubing and 3" x .188" wall channel. In order to limit unnecessary weight and to maintain structural strength, the driver's side, passenger side, front walls, and roof structure shall be 1 1/2" x 2" x .125" tubing on 14" centers. Double tube members shall be located at all vertical corners and single tube members shall be located at all horizontal corners eliminating void areas in the corners and thereby increasing structural strength. All structural members shall have full welds at each 90˚ joint. The rear wall structure shall be 2" x 2 1/2" x .125" tubing.

Comply_____Yes_____No

The roof and side body panels shall be minimum .080 sheet aluminum attached firmly by VHB tape (3M or equal). Short radius trim shall cover all edges. The body shall be of sufficient strength to pass the static load test referenced in KKK-A-1822F.

Comply_____Yes_____No

Aluminum 1/4" and 3/8" plates shall be welded to the walls or ceiling structures to provide firm securing for installed equipment (cabinets, benches, cylinders, rails, seat belts, etc.).

Comply_____Yes_____No

2.3.1. Fill Tube Enclosure:

Fuel fill tubes, fully recessed, shall be provided. The design shall be in strict compliance with FMVSS #301. Fuel caps must be flush with the module. The unleaded gasoline fuel fill shall have a locking gas cap.

Comply_____Yes_____No

2.3.2. Stone Guards:

Aluminum treadbrite stone guards shall be located on all four lower outside corners. Stone guards shall be formed to fit the corner structure.

Comply_____Yes_____No

2.3.3. Wheel Well Trim:

Aluminum treadbrite wheel well plates shall be provided at each rear wheel.

Comply_____Yes_____No

2.4. Overall Module Exterior Dimensions:

Length: Shall be 144" not including rear bumper or emergency lighting.

Comply_____Yes_____No

Width: Shall be 96" not including emergency lighting or scene lighting.

Comply_____Yes_____No

Height: Shall be 86" not including antennae.

Comply_____Yes_____No

2.5. Exterior Doors:

All exterior module doors shall have flush, stainless steel slam latches.

Comply_____Yes_____No

Compartment doors shall be constructed of .100" aluminum formed to provide a 1 1/2" thick door. Entrance doors shall be constructed of .100" aluminum formed to provide a 2" thick door. Doors shall close on an automotive type weather strip providing watertight integrity (Unigrip SD-352, or equal).

Comply_____Yes_____No

All doors, except that for the generator, shall be insulated with a spray type foam. Entrance doors shall have a horizontal reinforcement plate to retain the inside grab handle. Compartment door panels shall have an inside covering attached to the outer door lip. Entry door panels shall have an inside covering attached to the outer door lip. Each entrance door shall have a 12" long, 1 1/4" diameter stainless steel grab handle. Each rear door shall have a door hold open device (Cast Products "Grabber") mounted into aluminum plate behind the exterior skin.

Comply_____Yes_____No

2.6. Drip Rails:

There shall be a drip rail over the rear access doors and the side entry door.

Comply_____Yes_____No

2.7. Patient Compartment Access:

Access to the patient area shall be provided by a curbside and two rear doors. The curbside door opening shall be a minimum of 74" high and 30" wide. The rear doors shall provide a minimum opening of 56" in height and 48" in width. The curbside and right rear doors shall have inside and outside lockable door handles. All doors shall be equipped with two point latch assemblies complying with FMVSS 206. The left door shall have an inside handle only. An aluminum sheet shall be provided at the rear entrance door sill for protection of floor covering and covered with 3M (or equal) non- skid tape. All door latches shall be bolted with self-locking nuts. In no instance will cables be allowed for linkage between the latch points and release handle. Aluminum flat bars are required for linkage between the latches and release handle.

Comply_____Yes_____No

Door hinges shall be stainless steel hinge with minimum 3/16" stainless steel pin. The curbside door shall have a hold open device mounted at the top. Curbside doorstep shall be lined with .100" aluminum and covered with (3M or equal) non-skid tape.

Comply_____Yes_____No

Padded vinyl covered head bumpers shall be above both doorways.

Comply_____Yes_____No

2.8. Exterior Windows:

Curbside and rear doors shall have tinted double pane sliding windows with screens. The door window area shall be a minimum 16" high. The window framing shall be extruded aluminum with an inner and outer frame for clamping type installation.

Comply_____Yes_____No

There shall be an opening in the front wall of the module designed to interface with the sliding window in the driver's cab for visual and audible contact between the driver and attendants.

Comply_____Yes_____No

2.9. Exterior Compartments:

2.9.1. Compartment A: Oxygen:

Approximate I.D. is 19 1/2" wide X 42 1/2" high x 21" deep. This compartment shall be located at the floor line of the module on the driver's side and shall start at the module front wall. An oxygen cylinder shall be able to be horizontally loaded through the street side door. The access door must be vented with a stainless steel vent. A shelf shall be installed approximately 20" above floor the line. This compartment shall be lighted.

Comply_____Yes_____No

2.9.2. Compartment B: Forward Lower Street-side:

Approximate I.D. is 55 1/2" wide x 11" high x 21" deep. This compartment shall be located directly below the floor line on the driver's side and shall start at the module front wall. The access door shall have a hold-open device to allow the door to open past a 90 degree angle. This compartment is lighted. There shall be a "THIS IS NOT A STEP" sign installed on the interior face of the door.

Comply_____Yes_____No

2.9.3. Compartment C: Electrical:

Approximate I.D. is 34" wide x 23 1/2" high x 21" deep. This compartment shall be located at the floor line of the module on the driver's side between the oxygen compartment and the wheel well.

Comply_____Yes_____No

2.9.4. Compartment D: Miscellaneous/Radio:

Approximate I.D. is 17 1/2" wide x 14 1/2" high x 21" deep. This compartment shall be located aft of the electrical compartment and above the wheel well.

Comply_____Yes_____No

2.9.5. Compartment E: Lower Rear Streetside:

Approximate I.D. is 34 1/2" wide x 34 1/2" high x 21" deep. This compartment shall be located at the extreme rear of the module on the lower driver's side. There will be a shelf located at the floor line of the module and the compartment can be configured as an outside only or with inside/outside access above the shelf. This compartment shall be lighted.

Comply_____Yes_____No

2.9.6. Compartment F: Backboards:

Approximate I.D. is 20 1/2" wide x 9" high x 75" deep. This compartment shall be located at the rear of the module on the curbside and sit on top of the wheel well and generator compartment (H). The door shall be located next to the rear exterior doors and be hinged at the right side (curbside).

Comply_____Yes_____No

2.9.7. Compartment G: Generator:

Curbside behind wheel well, shall be minimum 37 1/2" wide x 21" deep x 21 1/2" high and not extend into the backboard storage compartment. The compartment must provide for manufacturer's minimum specifications for unrestricted fresh air intake. The decibel level inside the module shall not exceed 75 dB when the generator is running. The exhaust pipe must exit through the door.

Comply_____Yes_____No

2.9.8. Compartment H: Front Wall Interior/Exterior Access:

Approximate I.D. is 25" wide x 43" high x 34 1/2" deep. This compartment shall attach to the front and curbside walls and have one (1) shelf approximately 22" off the module floor. There shall be an area below floor level approximately 22 1/2" wide x 14 1/2" high x 21" deep accessible from outside the module only. The floor shall extend to the door to provide a division between the inside and lower outside sections. The outside access door shall be hinged at the forward edge of the module. The interior shall be open for access to the equipment stored inside (there will not be an interior access door). The shelf of the compartment shall have an anti-skid mat.

Comply_____Yes_____No

2.9.9. Locking System:

All compartment and patient access doors shall be keyed alike.

Comply_____Yes_____No

2.10. Interior Body Module:

2.10.1. Approximate Overall Interior Dimension:

Length: Measured from the front wall to the rear doors shall be 140". A minimum of 25" of unobstructed space at the head of the technician's seat to the forward edge of the cot shall be provided.

Comply_____Yes_____No

Width: Shall be 93" wall to wall. The width of the compartment at the wheel well shall be a minimum of 49".

Comply_____Yes_____No

Height: Shall be a minimum of 67" measured from floor to ceiling.

Comply_____Yes_____No

2.10.2. Interior Body Insulation:

Interior body insulation shall be a spray type foam applied to the roof and four (4) side walls. All requirements for self-extinguishment shall be met.

Comply_____Yes_____No

2.10.3. Interior Floor and Covering:

Interior floor underlayment shall be a composite material consisting of two (2) pre-finished aluminum cover sheets heat-bonded to a core made of polyethylene plastic. Vinyl flooring shall extend up side-walls approximately 4" and have a smooth radius from floor to sidewall. Vinyl flooring shall be Lonseal "Lonfloor", or equivalent. Plywood or wood products are not acceptable.

Comply_____Yes_____No

2.10.4. Interior Trim and Lining:

Upper walls shall be covered with Fiberglass Reinforced Product (FRP). The material furnished shall be completely smooth and shall be white. The squad bench, the area from the action wall level down from the rear of the unit to the front of the unit, and the CPR seat shall be covered in stainless steel.

Comply_____Yes_____No

2.10.5. Ceiling:

Interior ceiling shall be attached to the roof structure providing a void area for recessing LEDs and other fixtures, and allowing for easy access to wiring and coax. Ceiling shall be white in color.

Comply_____Yes_____No

2.11. Interior Cabinets/Areas:

All dimensions as stated are approximate. Construction material shall be .100" aluminum. Vendor shall provide on the front wall of Compartment H, a 115 volt wall plug.

Comply_____Yes_____No

Interior aluminum cabinets shall be finished with white powder coating. Exposed edges and corners shall be covered with padding as necessary. Metal plates welded to the wall or ceiling structures are not required in areas in which direct screw fastening to the structural

frame can be accomplished. These cabinets shall be equipped with sliding poly- carbonate scratch resistant doors.

Comply_____Yes_____No

2.11.1. Cabinet #1: Driver's Side:

Approximate I.D. shall be 34" wide x 17" high x 21" deep (this is the inside/outside part of Compartment E if needed).

Comply_____Yes_____No

2.11.2. Cabinet #2: Driver's Side Wall:

Approximate I.D. shall be 48" wide x 24" high x 12" deep, located directly above the action wall (Area #4) and is approximately 21" aft of the front wall. Two (2) horizontal shelves shall divide the cabinet to create three 8” high spaces.

Comply_____Yes_____No

2.11.3. Area #3: Driver's Side Corner:

Approximate I.D. shall be 21" wide x 24" high x 21" deep, located between cabinet #2 and #5 and on top of compartment (A) creating an open corner space. A mid-line shelf with a 1" lip shall be installed.

Comply_____Yes_____No

2.11.4. Area #4: Driver's Side Action Wall/Counter Top:

A false wall (45" wide x 19" high x 4" deep) shall be provided to hide radio wiring/cabling, electrical wiring, oxygen hoses, suction hoses, etc. Functions located on this wall are suction, dual oxygen outlets, and a quad 115 volt outlet. There shall be a hinged aluminum panel to provide access to the area behind the false wall without removal. A powder coated aluminum counter top shall be provided that is 56” wide x 17” deep with a 1/2” lip. A sharps container shall be located at the counter top.

Comply_____Yes_____No

2.11.5. Cabinet #5: Front Wall - Center:

Approximate I.D. shall be 35" wide x 24" high x 12" deep. This cabinet shall be secured to the front wall and is adjacent to cabinet #6. Two (2) horizontal shelves shall create three 8” high spaces.

Comply_____Yes_____No

2.11.6. Cabinet #6: Front Wall - Curbside:

Approximate I.D. shall be 35" wide x 24" high x 12" deep. This cabinet shall be secured to the front wall, ceiling and compartment H. Two (2) horizontal shelves shall create three 8” high spaces.

Comply_____Yes_____No

2.11.7. Cabinet #7: Oxygen:

Approximate I.D. shall be 36" wide x 16" high x 15" deep with a lid. The lid shall be hinged at the front wall. The bottom of the cabinet at the floor level shall be sealed.

Comply_____Yes_____No

2.11.8. Cabinet #8: Waste Basket:

Approximate I.D. shall be 21" wide x 7 1/2" deep x 10" high, forward of compartment G and the curbside wheel well. There shall be a 12” wide x 6” deep opening centered on the top to secure a wastebasket. There shall be a wastebasket provided. Bench seat padding shall not cover this area.

Comply_____Yes_____No

2.12. Curbside Bench Seat:

The bench seat shall be approximately 74" long x 16" high from the floor x 21" wide with three (3) self-retracting seat belt sets for passenger restraint and three (3) for patient restraint. The bench seat shall be padded with 3" seamless foam bottom and 2” back cushions. All cushions shall be attached by magnets and shall be removable. No velcro or screws can be used for means of attachment.

Comply_____Yes_____No

2.13. Driver's Side CPR Seat:

The CPR seat shall have a seamless foam top cushion over an aluminum base that is 22" long x 18" wide. The location of the seat shall be 41" off rear wall. A 2" foam padded backrest shall be required. The lid of the seat shall lift to access storage.

Comply_____Yes_____No

2.14. Technician's Seat (Captain's Chair):

This chair shall be a seamless, vinyl-covered high back "Captain's Chair" without fold-down arm rests (EVS or equal). It shall be mounted on a 360 degree swivel base, be capable of adjustment forward and aft, and have a retractable seat belt. Swivel base shall lock fore and aft.

Comply_____Yes_____No

2.15. Miscellaneous Equipment:

2.15.1. Overhead Safety Bar and Grab Handles:

A stainless steel overhead safety bar 72" long x 1 1/4" diameter shall be installed slightly off center towards the driver's side over the stretcher.

Comply_____Yes_____No

On the inside surface of the curbside door shall be provided one 30" long x 1 1/4" diameter

angled stainless grab rail. On the rear wall above the bench seat shall be provided one 12" long x 1 1/4" diameter stainless grab handle. On the inside surface of each rear door shall be provided one 12" long x 1 1/4" diameter stainless grab handle.

Comply_____Yes_____No

2.15.2. Stretcher Fasteners:

Aluminum plates shall be welded into the floor structure to secure all stretcher fasteners and brackets using stretcher manufacturer's approved bolting means.

Comply_____Yes_____No

Floor plates for a single position stretcher fastener shall be flush mounted in the floor of the module and provided with a watertight seal. The successful vendor will be notified which stretcher is selected to enable proper placement of brackets. All fasteners, hardware, and brackets shall be provided by the module vendor, except the cot securing antler and release bar. Stainless steel floor plates shall be provided to prevent the stretcher wheels from damaging the floor.

Comply_____Yes_____No

2.15.3. Suction:

An electrically operated suction pump (Impact 324 system or equal) shall be provided. The complete system and installation shall be per manufacturer's instructions.

Comply_____Yes_____No

2.15.4. IV Hangers:

Two (2) ceiling mounted, near-flush, rubber IV holders (Cast Products, or equal) with straps shall be provided. The ceiling holders shall be located between the waist and knee at both the primary and secondary patient locations.

Comply_____Yes_____No

2.15.5. Wall Mount Supply Holders:

An acrylic EMS supply container with multiple openings (made of white acrylic backing with clear acrylic pockets) shall be provided and located fore of the CPR seat.

The container shall be mounted onto Cabinet #2 (forward of the CPR seat). Overall width shall be 11 1/2" and height shall be 21 1/2", with five (5) openings provided in two rows. The top row contains two (2) openings and the bottom row contains three (3) openings for a total of five (5) individual openings. All openings shall be 4 1/4" high.

Comply_____Yes_____No

A supply holder of similar design shall be mounted on the wall aft of the CPR seat, overall width shall be 17" and height shall be 24", with fourteen (14) openings provided in three

rows. The top row shall contain three (3) openings, the middle row shall contain four (4) openings, and the bottom row shall contain seven (7) openings.

Comply_____Yes_____No

2.16. Oxygen System:

The oxygen system shall consist of the following equipment that shall be installed and made ready in accordance with C.G.A. pamphlet G-4.1 and National Standards for Medical Grade Oxygen Service. All hose and tubing shall be approved for medical oxygen service with a minimum rating of not less than 150 PSI.

Comply_____Yes_____No

Three (3) outlets shall be provided. Two (2) shall be located at the action wall and one (1) shall be located above the head end of the squad bench. All holes through which system tubing must travel shall be lined with rubber grommets. Tubing shall be covered with loom.

Comply_____Yes_____No

2.17. Module Heating and Air Conditioning:

Heating and air conditioning shall comply with KKK-A-1822F for performance in both the driver and patient area. The system for the module shall provide total environmental temperature control through a 120VAC heating-cooling unit which can operate in ambient temperatures ranging from 0 degrees to 110 degrees F. The AC/heat unit thermostat controls shall be located above the return air grille. The AC/heat unit must be installed at the rear driver's side of the module.

Comply_____Yes_____No

The patient compartment unit shall process air through a disposable air filter and then through the coil of the unit. There shall be two (2) adjustable louvers for adequate air volume and direction.

Comply_____Yes_____No

2.17.1. Air Conditioner/Heat unit:

The module air conditioner/heat shall be a 15,000 BTU, 120VAC, self- contained air conditioner unit with a 2.5 kW heat strip. The entire unit shall be accessed from outside the module in less than 30 minutes. It shall come with a 4 year parts and labor warranty and shall be certified for EPA 2010 requirements with 410A coolant. This unit is completely separate from the chassis factory (12 volt) air conditioner.

Comply_____Yes_____No

2.18. Electrical Equipment:

All wiring shall be stranded copper with thermoplastic insulation and sized for amp load connected in accordance with S.A.E. standards, minimum size 14 gauge. Wires shall

extend from wiring panel to a ceiling panel. Whenever possible wires shall be run in loom and where wire passes through metal panels, insulating grommets shall be provided.

2.18.1. Connections:
Electrical connections for the body module shall be provided with screw connections in such a manner as to permit transfer of the module from one cab and chassis to another without having to cut or splice wires.

Comply_____Yes_____No

All wiring shall be color and/or function coded and routed in high temperature conduit or loom conforming to SAE J562 as applicable. All wiring shall be located in an accessible, enclosed and protected location and kept at least six (6) inches away from exhaust system components.

Comply_____Yes_____No

Electrical wiring and components shall not terminate in the oxygen storage compartment (A). All conduit, loom and wiring shall be secured to the body or frame with insulated metal cable straps in order to prevent sagging and movement which may result in chafing, pinching, snagging or other damage. All apertures on the module shall have grommets for passing wire to conform to SAE 1292. The module electrical panel shall be located in compartment C.

Four (4) coaxial cables shall be installed in the ceiling raceway; two (2) shall terminate in the electrical compartment and two (2) shall terminate in the truck cab.

Comply_____Yes_____No

2.18.2. Fuses:

All 12 volt wiring shall be fused. Fuses shall be installed near the voltage source terminal in the electrical compartment (C). All fuses and circuit breakers shall be located where they are conveniently accessible for prompt fuse replacement and/or resetting. No protective device shall be located in a manner that requires removal of any equipment to restore voltage after a voltage interruption.

Comply_____Yes_____No

2.19. 12 Volt DC Electrical Power:

Module 12 volt busses shall receive power from either a separate 115 volt to 12 volt power converter unit powered through the generator or shore power, or from the truck 12 volt system. The 115 to 12 volt power converter shall be mounted in the electrical compartment a minimum of 4 feet above ground level when mounted on the vehicle. The power converter shall be a regulated, filtered, continuous duty, electronic 100 amp device @ 13.3V or equal. The power converter shall receive its 115 volt power from either the generator installed in the module or from activation of the shore power circuit. However, if shore power is activated, the generator must be automatically disconnected.

Comply_____Yes_____No

In the event of failure of the generator unit, the 12 volt power source for the module electrical systems shall be switched from the power converter to the vehicle battery. This power source change shall be accomplished automatically at the instant power is lost from the generator. The 12 volt power converter unit must have current limiting and over voltage protection with a means of adjusting the voltage level as required.

Comply_____Yes_____No

All 12 volt wiring shall be color and/or function coded in accordance with a wiring diagram that shall be installed on the inside of the electrical compartment (C) door. An example on how to troubleshoot each 12 volt circuit shall be shown on the diagram. A labeled circuit panel is to be supplied in the electrical compartment. Relays rated at 75 amps with screw connection terminals shall be used for the individual 12 volt circuits. NO EXCEPTIONS.

Comply_____Yes_____No

2.20. 115 Volt AC Circuits:

Each 115 volt circuit will be protected by a minimum 15 amp breaker.

Comply_____Yes_____No

All 115 volt wiring will be done per National Electrical Codes. The 115 volt wiring from the generator and shore power line shall be minimum 10 gauge. The 115 volt wiring for all individual circuits will be minimum 14 gauge.

Comply_____Yes_____No

Four 115 volt circuits in the breaker panel shall provide power for:

1) The module 115 volt to 12 volt regulated power converter
2) The module air conditioning/heater unit
3) The module 115 volt receptacles
4) The module 115 volt side scene lights

Comply_____Yes_____No

In order to maintain minimum module emergency functions in the event of a generator failure, at least one (1) 70 amp solenoid or relay is required which will automatically transfer power from the chassis alternator to the module if the generator is not providing 115 volts. This solenoid or relay shall be sized to carry the load of all warning lights, interior lights, and electric suction.

Comply_____Yes_____No

2.20.1. Battery charger:

The module shall have a 30 amp, 115 volt, automatic cut off battery charger “Intelli-Power, model #PD9130A.” The battery charger will be powered off shore power.

Comply_____Yes_____No

2.21. Shore Power:

The module shall have a shore power connection through a 30 amp recessed male receptacle located behind the driver's seat on the front outside face of the module. A flip-up rain-tight cover shall be provided. With shore power activated, selected functions shall be available while the module is parked and the generator is off. The mating female receptacle shall be provided.

Comply_____Yes_____No

2.22. Module Engine/Generator:

The generator shall provide the primary source of electrical power for all module functions, including, but not limited to, all exterior emergency lights, interior lights, air conditioning, heating, suction, and load lights.

Comply_____Yes_____No

In the event the generator should fail, electrical power shall automatically switch back to the cab/chassis alternator system thereby providing 12 volt power for emergency lighting, interior module lights, and suction.

Comply_____Yes_____No

The generator shall be either an Onan "Commercial 5.5 HGJAD-2138B", or latest model. The generator shall be capable of being individually started at both the generator compartment (G) and the driver's console. The generator shall be installed, plumbed, and wired per manufacturer's instructions.

Comply_____Yes_____No

The connection from the generator to the module shall be through a locking 30 amp connector.

Comply_____Yes_____No

2.22.1. Exhaust System:

The exhaust system for the generator shall consist of heavy wall exhaust pipe mounted to the engine and shall extend outside through the generator compartment door. The fresh air intake and exhaust air are to be designed per manufacturer's specifications. Nothing shall obstruct these air passages.

Comply_____Yes_____No

2.22.2. Fuel System:

Fuel shall be supplied from a certified auxiliary 9 gallon tank mounted between the frame rails of the chassis.

Comply_____Yes_____No

2.23. Lighting Equipment; Interior and Exterior:

Eight (8) flush mounted interior LED ceiling lights shall be installed in the ceiling of the module. These lights are to be controlled by switches at the action wall and at the console.

Comply_____Yes_____No

LED clearance lights shall be mounted on all upper corners of the module in addition to the factory combination reflector/clearance lights.

Comply_____Yes_____No

One (1) 250 watt, 115 volt quartz halogen scene light shall be installed on each side of the module. Two (2) 12 volt halogen load lights shall be installed at the rear of the module.

Comply_____Yes_____No

2.24. Emergency Lighting:

There shall be eight (8) 6”x4” LED fixtures located on the upper corners of the module. There shall also be five (5) 6”x4” LED fixtures on the front of the module in lieu of a light bar as well as three (3) 6”x4” LED fixtures on the rear of the module. One (1) 6”x4” LED fixture shall be located above each wheel well. The four (4) grille and intersect lights shall be 4”x3” LED fixtures. All LEDs except the grille and intersects shall have a chrome flange.

Comply_____Yes_____No

2.25. Paint:
The paint system shall be acrylic urethane applied per manufacturer's specifications for raw aluminum substrate. Paint color shall be gloss white. Systems such as Sherwin-Williams, PPG, Sikkens, etc. shall be acceptable.

Comply_____Yes_____No

2.26. Striping and Lettering:
The successful vendor shall stripe and letter the unit with 3M reflective material to match the fleet of_____. Striping and lettering pictures to be furnished upon request.

Comply_____Yes_____No

2.27. Fire Extinguisher:

Vendor shall supply one (1) fire extinguisher, ABC dry chemical, multipurpose, 5 lb. in a location to be determined.

Comply_____Yes_____No

2.28. Rear Step/Bumper:

A full width, three piece rear step/bumper shall be fabricated from “grip strut” aluminum,

minimum seven (7) inches deep with a powder coated metallic silver finish. The bumper shall support a weight of 500 lb. without flexing. The outer ends of the bumper shall be fabricated out of .188 aluminum plate. A full width kick plate shall be provided below the rear door opening. The bottom of the bumper shall not extend below the module. The bumper shall be bolted to aluminum plate welded into the structure.

Comply_____Yes_____No

Fire Apparatus Vehicles, Equipment and Accessories

Fire Apparatus Vehicles, Equipment and Accessories

1.1. Houston Fire Department Engine Specification

See Attachment B-1 of this RFP for specification.

1.2. Houston Fire Department Aerial Ladder Specification

See Attachment B-2 of this RFP for specification.

1.3. Houston Fire Department Aerial Tower Specification

See Attachment B-3 of this RFP for specification.

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Specialty Vehicles, Equipment and Accessories

Specialty Vehicles, Equipment and Accessories

1.1. Vehicle: Mobile Command Center

1.1.1. Conformance to Specifications and Requirements

Manufacturer names and part numbers are used for the purpose of describing needs and establishing general quality levels. Such references are not intended to be restrictive. The City is entitled to determine upon any reasonable basis what constitutes a product that is equal or superior to the product specified, and any such determination is final.

1.1.2. Prices Cover Entire Work Including Delivery

All prices shall include all shipping, delivery and unloading costs. Delivery shall be to the City of Houston, 1200 Travis Street, Houston, TX 77002. Proposer shall notify City at least 5 business days prior to delivery.

1.1.3. Manufacturer

To ensure continuity, quality and warranty, the manufacturer shall be the manufacturer of the entire modular body and shall mount that modular body on the specified chassis. The manufacturing and mounting of the modular body shall not be performed at a location or by employees other than that of the manufacturer to who the contract is awarded. A prototype or non-proven body will not be accepted.

1.1.4. Completion/Delivery Date

Delivery shall be made within **180 days** after receipt of purchase order.

1.2. Scope of Work

The objective of this Scope of Work is to outline the requirements and general functional areas believed to be necessary to successfully perform this contract. The Scope of Work is to be used as a general guide and is not intended to be a complete list of all work or requirements necessary to furnish a Police Mobile Command Vehicle.

A. The City is seeking a qualified contractor to furnish one Police Mobile Command Vehicle that meets the equipment specifications listed below.

B. The contractor must assume complete responsibility for all component parts of the entire vehicle. This responsibility shall include design, construction, inspection, performance testing and servicing. The contractor must be capable of furnishing parts, performing repairs and providing technical assistance for the normal life of the vehicle.

C. The contractor must provide high quality equipment, components, and parts designed for the vehicle that are new and of current manufacture. The

use of military surplus, used, obsolete or discontinued items will not be acceptable.

D. The contractor must be responsible for assuring that the vehicle meets the specified performance criteria. All major components shall have the manufacturer's approval and recommendation for this type of service and the manufacturer's ratings shall not be exceeded by actual imposed loads.

E. The contractor or factory certified dealer, shall be responsible to provide the City for all warranty service, parts, labor, and travel costs applicable to the equipment provided. The responsible contractor or authorized dealer shall be responsible for ensuring that warranty work is performed and that service, parts, labor and travel are available and provided to meet the City's schedules. This does not limit or reduce in any manner the manufacturer's warranty or use of manufacturer's warranty service. Warranty repairs and parts shall be initiated within 48 hours of initial notification by the City. All work required under warranty shall be promptly accomplished at no expense to the City. Supplier shall stock critical spare parts and make them available within 24 hours from notification by the City. Critical spares list to be provided with bid detailing associated costs.

F. The contractor shall immediately send the City written notification of all manufacturer's recalls of equipment purchased and all service bulletins.

G. The contractor must be able to provide warranties on all equipment, parts and materials furnished under this proposal and guarantee that they will meet all contract requirements and are free of defects in equipment, material, or workmanship and are fit for its intended purpose. The qualified contractor shall be fully responsible for all warranty work on the purchased equipment which includes but is not limited to after-market installations as required by the equipment specifications. The warranty period shall commence at the time the vehicles are accepted by the City. Delivery of the vehicle does not constitute final acceptance.

H. The contractor must be able to provide training, technical support and assistance as required.

I. The awarded contractor must be able to deliver the vehicle no later than **180** calendar days after the receipt of the purchase order. Actual delivery date will be determined by the City at the time the purchase order is issued.

J. Liquidated Damages will be assessed in the amount of $200.00 per calendar day, for each and every calendar day that delivery is delayed beyond the required delivery timeline.

K. Police Mobile Command Vehicle shall conform to the specifications / requirements listed below.

1.2.1. Chassis / Power Component / Body

- 2015 model commercial duty rear wheel drive with at least 14,500 GVWR capacity.

- Gas engine with automatic transmission, power steering and brakes with 4 wheel disc anti-lock braking system, overdrive, oil cooler & air conditioning.

- Body shall be of aluminum construction with locking twin rear doors. Load space of no less than 14 feet long, by 90 inches wide by 80 inches high. Full step tread plate bumper. “Aerocap” interior bulkhead door to cab and one side access door with window. Separate communication and conference rooms (2), of equal size with pocket door access.

1.2.2. Interior / Electrical

- Final Stage Certification required and altered vehicle certification as fully compliant to FMVSS 49 CFR Part 567.5 and 567.7. Payload sticker shall be evident inside cab area that’s states vehicle load rating and axle payload. Vehicle height warning sign on dash.

- Insulated walls and ceiling with sub wall sheeting and reinforced FRP smooth lining. Ceiling has a fire resistant fabric covering.

- Non Skid commercial grade PVC one piece flooring throughout on top of tongue and groove plywood sheeting.

- Kitchen shall include 2.5 cu ft. refrigerator / freezer with at a minimum 1 cubic foot/ 700 watt microwave.

- 3 Swivel chairs for operational work in communication room. Kitchen shall include two benches with removable tables. All furniture is to be covered with heavy duty vinyl.

- Maximum allotment of custom fabricated cabinets shall be installed on sidewalls with laminate counter tops underneath. Dry erase (2’/2’), marker board.

- External 120/240VAC power with at least a 6 kW 120 volt AC. Generator mounted in separate aluminum cabinet at 7000 7kw 120 volt. Maximum fuel efficiency and minimal sound decibels (<65), required under full load including over speed and under speed protection. Generator has separate control panel 50 / 60 amp main breaker with six UL listed magnetic hydraulic branch circuit breakers. Separate control panel mounted internal work space with full metered components and magnetic / hydraulic circuit breakers. 12

VDC 60 Amp converter / charger, able to charge three banks of batteries at a time. Six deep cycle batteries interior mounted. Interior florescent lighting. White Halogen scene lighting, siren amplifier and high performance speaker. Emergency and scene lighting package. All emergent lights are to be manufactured by Whelan.

- HVAC system for internal workspace with reversible three speed twelve inch power roof ventilator. Work space ducted air conditioner (13,000 BTU, low profile), and two heaters (5000, BTU).

1.2.3. Exterior

- 12VDC LED emergency lighting package. Super LED light head with internal flasher, blue LEDS with clear outer lens. Includes chrome flange. All products to be manufactured by Whelen.

- Painted white.

1.2.4. Miscellaneous

- 36 inch flat panel superior brand LED HDTV mounted on wall with digital powered antenna to HD TV.

- 12 Vdc for power to radios / dual head radio with installed antenna.

- All wiring, electronics, electrical system and powered components shall be UL listed. Two gauge copper stranded wire shall be used for all runs. Full length runs no splicing or wire. All connections staked, soldered, color coded and sealed. Resettable breakers that are all labeled. Pass through to communication center for cables. Fire extinguisher, carbon monoxide and smoke detector are required. Full set of Manuals for vehicle, and all accessories are provided by Proposer.

- Install customer provided antennas and antenna cables terminating to a single location.

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Specialty Vehicles, Equipment and Accessories

Specialty Vehicles, Equipment and Accessories

1.1. Vehicle: Mobile Medical Unit

1.1.1. Dimensions

Overall Length	38 ft. 11 in.
Exterior Width	101 in.
Overall Height	11 ft. 8 in.
Interior Width	96 in.
Interior Headroom	86 in.
Interior Floor Length (behind cab area)	30 ft. 7 in.

1.1.2. Chassis Specifications

Chassis Type	Freightliner front engine diesel (FRED) chassis
Wheelbase	248"
GVWR	26,000 lbs.
Frame	5/16” X 3” X 9-1/8” 50,000 PSI Steel
Engine	Cummins 6.7L electronic diesel 340 HP 660 lb-ft torque
Transmission	Allison 2200MH, 6 speed automatic with overdrive
Alternator	Leece-Neville 160 AMP alternator
Battery	12V maintenance free, 1300 CCA 160 amp/hr.
Brakes	Bosch hydraulic brake package Wabco hydraulic 4S/4M without traction control Parking brake, transmission mounted, foot operated
Fuel Tank	80 (U.S.) gallon capacity, between frame rails Driver’s side fuel fill. Bio-Diesel fuel up to 20% blend “Diesel Fuel” permanently mounted near fuel fill Generator fuel pickup tube installed by fuel tank manufacturer, set at depth not to empty tank
Front Axle	10,000 lb. capacity, Hendrickson STEERTEK
Suspension Front	10,000 lb. capacity, Hendrickson SOFTEK Single stage, constant rate Front shock absorbers
Rear Axle	17,500 lb. capacity, Axle Alliance Corp.

	Axle ratio, 4.78:1
Suspension Rear	60” taperleaf springs Custom tuned Sachs shocks
Cooling	Anti-freeze protection; ethylene glycol, 50/50, to -35 □F
Steering	TRW THP-60 power steering
Horns	Dual electric Back up alarm
Instruments	Fuel level, engine coolant temperature, engine oil pressure, electronic speedometer with odometer, tachometer, alternator gauges; directional signal and high beam indicator, warning lights
Tires	255/70R22.5 LRG 16 Ply
Wheels	22.5" x 8.25" Stainless steel wheel liners
Miscellaneous	Cruise control integrated into steering wheel Trailer hitch, rated 5,000 lb. draw bar, 350 lb. tongue weight 10 Gallon exhaust fluid tank Block Heater – Pillips-Temro 750 Watt/115 Volt

1.2. Scope

1.2.1. Body Specifications

A. Body shall be coach style, flat interior floor. Body framework to be welded aluminum designed to be durable, and adequately reinforced at all points where road shock and vibration stress concentration occurs. All cab steel to be electroplated for rust protection and to eliminate corrosion and oxidation concerns.

B. Interlocking extruded aluminum structural components create integrated floor-to-sidewall, and sidewall-to-roof joints. Steel mounting plates to be located in walls for mounting cabinets and appliances.

C. Exterior skin to be fiberglass, smooth one piece, high gloss, bright white. Exterior side paneling shall be designed to contribute to the overall structural integrity of the coach body.

D. Roof shall be one piece fiberglass, run the full length of the roof, provide sufficient strength for walking. Roof to be crowned for water run-off.

E. Roof to be structurally reinforced in the area where each air conditioner is installed. Roof reinforcement shall address not only the weight of the air conditioner unit but the additional stress created by the continual vibration of the unit when in operation. Coach roof shall be adequately caulked and sealed from moisture and the environment in general around the area of the air conditioner installation.

F. Body shall have street-side sedan driver's door with power raise/lower window, vertically mounted assist bar and exterior step.

G. Body shall have one (1) swing out main entrance door, 28" x 76", on right side in cargo area. Door shall be double constructed aluminum with polystyrene foam insulation in the core with a fixed window 18" x 28", slam type latch and dead bolt lock.

H. Two (2) interior stepwells at main entrance door. Each step tread shall be molded non-slip rubber tread material. The treads shall be securely fastened and silicone sealed at the edges.

I. Main entrance door to have one (1) dual electric step, equipped with permanent magnet motor and control unit, door activated with ignition override. Steps to be equipped with power switch to allow steps to be locked in the down position when entrance door is open. Steps to be wired to engine battery, with textured skid surface.

J. Full body width integrally molded rear bumper.

K. Front bumper, integrally molded into front cap, steel reinforcement.

L. Fiberglass, single panel, hinge down hood provides access for service, fluid checks and fill points.

M. Remote control exterior mirrors with defrost feature. Each mirror to have 60 sq. in. minimum viewing area, flat glass and 30" minimum viewing area, convex glass.

N. Mudflaps with anti-sail brackets on rear axle.

O. Tinted laminated safety glass windshield mounted in steel with non-hardening sealants with driver and passenger sun visors.

P. Windshield wiper motor and wiper arms mounted in steel. Wipers provide intermittent feature with single motor and pantograph arms.

Q. Exterior compartments, lighted, fully hinged with gas strut supports and a single paddle latch release.

R. Daytime running lights. Upper brake light to be provided located in the middle of the rear of the vehicle, 10" x 40" over the rear bumper.

1.2.2. Driver/Passenger Cab Area

A. High-back driver's bucket seat with armrests, headrest, recline, multi-adjustable, manual adjustable lumbar and three point shoulder and lap seat belt with retractors. 180 degree swivel and slide pedestal control.

B. High-back passenger's bucket seat with armrests, headrest, recline, multi-adjustable, manual adjustable lumbar and three point shoulder and lap seat belt with retractors. 180 degree swivel and slide pedestal control.

C. Two (2) front windshield fans, *Meradyne* 3000 or equal.

D. Overhead storage above windshield.

E. Driver cab entry door.

F. Wrap around pleated shade for windshield.

G. AM/FM/CD and cassette stereo with digital clock, seek and scan feature to be located in the dashboard easily accessed by driver. Roof mounted radio antenna. Includes two (2) cab area speakers, 6" each.

H. Sign on dashboard with vehicle height listed 13' 6".

I. Payload sticker in cab area with vehicle axle loads and available axle payload as built.

1.2.3. Interior

A. One (1) 9V smoke alarm, ceiling mounted.

B. Two (2) 5-pound dry chemical fire extinguishers located near exits.

C. Floor to be covered with *customer selected commercial vinyl.*

D. Finished ceiling to be sound absorbing, flame retardant, solution dyed polypropylene fiber material, 24 oz. minimum. Class A rated per ASTM E-84. Continuous run from front to rear.

E. Walls and ceiling insulated with polyurethane block foam sheet insulation bonded and routed to incorporate framework. Ceiling "R" factor of 14.

F. Interior walls covered with luan vinyl.

G. 1-1/8" plywood floor with 1/4" minimum exterior grade plywood underlayment for finish flooring.

H. All bulkheads to be laminate finished, color matched.

I. One (1) 24" x 30" driver's side, emergency exit window to be provided.

J. Adjustable ergonomic office type chair, with pneumatic height control, swivel pedestal and five (5) caster wheels to be provided for each workstation. Chairs shall be cloth upholstered, seat height and back supports shall be adjustable. Chairs shall be secured in knee space area for travel by a strap or bungee cord. All chairs to have protective plastic edge on rear corners to prohibit damage from countertop edges.

1.2.4. Cabinets

A. All cabinets to be constructed of 3/4" cabinet grade plywood with laminate finish.

B. No particleboard, fiberboard or MDF materials to be used in cabinet construction.

C. All cabinet doors to be finished with polished white laminate dry-erase boards or laminate.

D. All horizontal-hinged cabinet doors to have Grass KB70 hinges with integrated hold-open and soft-close features to prevent opening while vehicle is in motion. All doors to be cut using aircraft tolerance CNC router.

E. All vertical-hinged doors and drawer fronts to have chrome finished *Lamp* catches with deadbolt or locks to prevent opening while vehicle is in motion. All doors to be cut using aircraft tolerance CNC router.

F. All drawer faces to be finished on all exposed edges with 3mm color-coordinated hardened PVC edge-banding with radius corners and edges. All drawer faces to be cut using aircraft tolerance CNC router.

G. All drawers to be assembled using a modified dovetail process.

H. All cabinets to be mechanically fastened or screwed, no staples.

I. Shelves are to be constructed of 3/4" cabinet-grade plywood with no voids on sides and have 2" extruded aluminum front lip.

J. All shelving is to be adjustable in 1.125” increments.

K. All drawers are to use heavy-duty, ball bearing, double-action drawer slides.

L. Countertops to be 3/4" cabinet-grade plywood, doubled to 1.5” at the edges and finished with 1.5” x 3mm or 1.5” x 2mm color-coordinated hardened PVC edge-banding with radius corners and edges.

M. All cabinets to be European face-frame design with flush-mount door and drawer faces.

N. All exposed corners to be .125" minimum, anodized, extruded aluminum with 1" radius. Visible fasteners on exterior radius corners are NOT acceptable.

O. All cabinets to be cut using aircraft tolerance CNC router. Designs must be saved for 20 years.

P. All plywood to meet or exceed CARB air standards.

1.2.5. 120/240V AC Electrical System

A. All wiring shall meet or exceed NEC or applicable FMVSS standards. For ease of maintenance and service a removable wiring access panel parallels all horizontal wiring routes.

B. One (1) 12KW water cooled diesel powered generator.

C. Generator compartment to be insulated with high density sound absorbing foam and oil resistant foil faced lining.

D. Generator shall be plumbed to draw fuel from chassis fuel tank.

E. All 120/240V AC main wiring is to be stranded, bundled and color coded THHN wire.

F. Install one (1) 120/240V AC control panel with generator and shore power main breaker UL listed magnetic/hydraulic branch circuit breakers with LED indicators to show activation.

G. Install duplex wall outlets at each workstation.

H. All electrical circuits and appliances shall conform to applicable national electrical codes.

I. 50 Amp shore cord hardwired to coach.

1.2.6. HVAC System

A. Install four (4) 13,700 BTU air conditioners.

B. Forced air electric heat evenly distributed and designed to keep the interior at 72°F when the ambient temperature is at 0°F.

C. Two (2) roof ventilators, powered, reversible, *Fantastic Vent* or equal.

1.2.7. 12V DC Electrical System

A. In addition to the chassis batteries, two (2) group 27 deep-cycle batteries to be provided. Batteries shall be installed underfloor in weather resistant compartment.

B. All 12V wiring THHN stranded, bundled, color coded and numbered.

C. One (1) 75 amp minimum power converter with charger to convert 120V nominal AC to 13.6V DC to include reverse battery polarity protection, brown out input protection. Fan speed to be controlled by converters internal ambient temperature.

D. One (1) solenoid to be installed to allow alternator to charge the main and auxiliary batteries while vehicle engine is running.

E. Two (2) *Cole Hersee* M284 master disconnect switches for main battery system and auxiliary battery system.

F. 12V DC control panel with UL listed magnetic/hydraulic circuit breakers with LED indicators to show activation.

G. LED light fixtures to be provided throughout.

1.2.8. Wiring Requirements

A. 2-Gauge minimum copper stranded battery cable to be used for 12V DC main supply lines. All cable runs to be full length, no splices. All cable terminals are to be staked and soldered.

B. All added electrical circuits shall be protected from over current by resettable circuit breakers appropriately rated for the load.

C. Circuit breaker functions are to be identified by engraved or printed labels.

D. All wiring shall be numbered or lettered on 6" centers minimum.

E. All wiring is to be protected from chafing and abrasion.

F. Where wire passes through sheet metal, bulkheads and structural supports plastic grommets shall be used to protect both wiring and wire looms.

1.2.9. Lavatory

A. Toilet, sink, power ceiling vent with fan, sink cabinet, mirror. Restroom dimensions 45"x 35" minimum with solid door.

B. Forty gallon minimum water capacity, electric water heater, demand water pump, monitor panel, forty five gallon holding tank minimum.

C. Install one (1) 10" x 14" stainless steel sink with chrome-plated laboratory style sink hardware.

D. One (1) *Aqua Magic* toilet in lavatory.

E. Chrome-plated paper towel dispenser and toilet paper holder in lavatory.

F. One (1) each GFCI duplex wall outlet in lavatory.

G. Water pump with accumulator tank, Surflo or equal, 2.8 GPM.

H. Hot water heater, two gallon fast recovery, electric.

I. Water inlet with a non-regulated tank fill, with locking access door.

J. All plumbing pressure pipes shall be CPVC.

K. Sewage hose and dump valve shall be provided for holding tank.

1.2.10. Miscellaneous Standard Features

A. Automatic hydraulic leveling system sized for GVW of vehicle.

B. Rearview camera system with monitor custom built into dashboard, to be provided to assist in backing up vehicle. Monitor is 7" measured diagonally and automatically turns on when vehicle gear lever is set in reverse. Camera to provide field of view of 100 degree horizontally and 80 degree vertically.

NOTE: Model numbers for individual equipment are subject to change from equipment manufacturers. Chassis specifications are subject to model year changes.

All vehicles delivered with as built interior and exterior AutoCad and/or Solid Works drawings. Complete wiring schematics provided with each vehicle.

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Specialty Vehicles, Equipment and Accessories

Specialty Vehicles, Equipment and Accessories

1.1. Vehicle: Mobile Lab/Classroom

This lab will include one instructor console, at least ten student work stations operating in a networked computer environment that includes an integrated sound and visual display system. The lab will be capable of running off of its own generator or it can be connected to an external power source. A semi-private conference area with bench seating and removable table will be included in design for interviewing and counseling.

Vendor should provide for basic driver training as well as standard operational checklist. A supply source for factory-approved mechanical service in the Houston area is required.

1.2. Specifications

1.2.1. Chassis, Coach and Overall Dimensions

The chassis exterior should be approximately:

Width:	Interior Exterior	no less than 96” wall to wall no more than 102”
Height:	Interior Exterior	no less than 84” no more than 155” with AC unit
Length	Exterior	No more than 40’

Rear wheel wells may not intrude into main interior space. Hydraulic leveling system will be included for vehicle stabilization when parked. The exterior shall be designed to be as aerodynamic as possible. Vendor should state in bid document the materials that will be used as outer skin.

Vehicle should be equipped with a heavy duty towing package front and rear.

1.2.2. Engine, Transmission

The engine transmission should fulfill the following minimum requirements:

- High Performance Engine with a minimum 250HP.
- Minimum 5 speed automatic with overdrive transmission.

- Gas or Diesel –vehicle and generator fuel type to match

Heated Fuel/water separator as applicable.

1.2.3. Electrical

Two on-board generators with a minimum of 240 VAC. 60 AMP service per generator are preferred. Generators should be rated to operate at minimum capacity for no less than 8 hours with a system to prevent depletion of chassis fuel tank(s). One generator should be wired for Stand By. Generator control will be located in interior of unit. Other generator configurations will be considered if submitted in the bid documents and detailed as to design safeguards for backup and optimum efficiency.

Transformers and/or voltage converters to power all computer workstations, including instructor console and 1 network server with 120 VAC single phase. Filtered and surge-protected power is required.

A service line 'umbilical cord" at least 36 foot long is to be provided to allow mobile unit to be powered from land based power source. An in-line voltage regulator isolator/filter is required for the land line umbilical cord.

1.2.4. Vehicle Features

Front and rear bumpers with license plate brackets are required. Molded bumpers are desirable. Undercoating of floor, skirts and wheelhouses.

Quartz Halogen headlights are required.

All glass should be automotive strength and tinted.

Brakes should be heavy duty air brakes or front and rear disc breaks with ABS (anti-locking system).

Vehicle should have all switches, door locks, turn signals, driving lights, and docking lights installed and in compliance with Department of Transportation (DOT) specifications.

1.2.5. Exterior Features

A minimum of two entrance doors will be required, one in front and one in rear of unit. Rear door will be wheel chair accessible with a single full platform lift compliant with ADA. The unit may have optional third door for wheelchair accessibility. All doors should be positioned to open forward. There will be exterior grab rails at each door.

A patio style awning should be placed down the length (or specified portion thereof) of the curb side of the coach.

The exterior lighting is to permit full illumination of the coach perimeter. Adequate lighting to permit limited use during dusk/night as well as vehicle security is required. The exterior lighting is to include patio light, utility light, step light, driving lamps, and docking lights. The exterior lighting should be tied to the vehicle security system to turn on at alarm.

Heavy duty automatic steps should be included for the vehicle entrance doors. Steps should be capable of being stored inside or underneath the vehicle while not in use and of such design to accommodate heavy use.

Exterior storage compartment(s) for batteries and service line with locks.

The exterior body graphics and paint specifications will be supplied after bid award. Pricing should include basic exterior paint package.

1.2.6. Interior Features

This mobile unit will <u>not</u> have lavatory amenities nor kitchen facilities.

A minimum of two roof mounted air conditioning units are required. The units should be rated at a combined minimum capacity of 40,000 BTU. A minimum of four electric baseboard heaters (120 volt) with internal thermostats are to be mounted near floor level of interior cabin. Other heating and air system configurations will be considered if submitted in the bid documents

There should be a master switch for light fixtures. This includes a two way switch with one switch near the main door with a second switch at the instructor workstation. A master switch to turn on/off power to all student workstations should also be located at the instructor workstation.

All interior storage compartments must be lockable and keyed alike.
The floor material for the classroom compartment is to be similar in appearance to hardwood floor. This may be actual hardwood flooring, or a plywood material with an upper veneered surface designed to look like hardwood flooring. The flooring should be coated for maximum durability. A durable commercial grade carpet type material may be an acceptable option.

Minimum interior lighting will be 110 volt recessed overhead double tube fluorescent fixtures installed the full length of the interior roof.

All wooden furnishings are to be made from either Oak, Maple or Birch woods, including furniture grade Oak, Maple or Birch veneered plywood. Counter tops for student desk area may be laminate with molding on all edges. Cabinets for workstations will include sound deadening fabric with class1 fire rating, hidden hinges, and keyed alike cylinder locks.

Smoke and carbon monoxide detectors /alarms and surface mounted fire extinguishers (2).

1.2.7. ADA Considerations

The classroom should be wheelchair accessible. A full platform wheelchair lift is required.

At least one student computer workstation must be wheelchair accessible with adjustable height keyboard tray or table top.

1.2.8. Computer Workstations/Learning Lab

Lab area will contain a minimum of 10 (up to 12 if space is available) student computer workstations and 1 instructor computer console. Student workstations facing front or rear of vehicle are acceptable. The instructor workstation must be oriented so that instructor faces students. All student workstations should be of an ergonomic design. The instructor workstation may be of desk type design if necessary. All corners of workstations and coach interior components will require ample rounded corners to prevent injury to students and instructor while moving through classroom space.

All workstations will be securely attached to wall and have cabinetry for equipment storage. Each monitor/computer will be secured to the workstation. Exact workstation design will be determined at a later time and monitor/computer model will be provided at a later time to the vehicle fabricator in order to finalize workstation design.

Pre-wiring will include CAT 6 outlets and wiring at each desk that will terminate to a Patch Panel in server cabinet. Panel must include a minimum of one spare port. Details will be resolved with the vehicle fabricator. All cabling will be contained and accessible.

The instructor workstation will include a control center with access to all equipment controls: lights, power switches for computers, VCR remote, and network server computer. Controls may be mounted on the instructor workstation and/or the adjacent walls.

A storage closet/cabinet with ventilation near the instructor workstation will house the network server equipment, DVD / VCR, additional drives, backup computers, printers, scanner, class materials and handouts.

Seating for all workstations will be provided and be cloth covered foam padded seating, treated with stain guard. Seating color schemes will be decided at a later time in coordination with vehicle fabricator. Seating may be wheeled but will include option for lockdown when in transit. Seating for all workstations will be based upon a standard medium to high end office chair with manual tilt adjustment, height adjustment and lumbar support.

1.2.9. Driver's Compartment

One driver's chair is required and have lumbar support, multiple adjustable recline mechanism, multi-position armrest and three-point shoulder and lap seat belts. Design may include co-pilot or additional DOT compliant additional seating for use while unit is traveling.

At a minimum, the following features should be available: Automotive A/C with defrost and bi-level function. Vinyl padded dashboard, with glove box.
Carpeting in driver's compartment, with floor mats. Auxiliary defrost fans.
AM/FM Radio with CD player, minimum 4 speakers. Map pockets.
Exterior powered mirrors with remote controls on both sides of coach.

Sun visors.

Cruise control.
Full instrument panel, with 12 volt receptacle and lighter.

Full curtain solar/privacy barrier that can be drawn around inside of windshield to prevent heat buildup and sun glare in driver's compartment.

1.2.10. Conference Area

A conference area with bench seating and removable table will be integrated into plan to allow for a semi-private interview, counseling area. Accordion door for privacy if possible.

1.2.11. Additional Equipment

<u>Audio Visual/Sound</u>
Flat screen plasma monitor – minimum 42" with ceiling mount, networked to overhead speakers, computer system and DVD/VCR

Ceiling mounted speakers with lavaliere and hand held microphones

<u>Security System</u>
On-board security system, main access in driver's compartment. Secondary security system shut off near main door. The performance requirements of vehicle security system will be developed with vehicle fabricator and alarm manufacturer.

<u>Internet / Intranet Telecommunications</u>

Cellular router system, supported by at least three (3) wireless carrier networks, connected to all computers.

Land line phone system with internal jack (location TBD).

Complete 2 Way Broadband Wireless Internet Satellite System to include: Self-storing roof mounted satellite dish.

Concealed Cabling

iNetVu Software

Systems above must be internally wired to Ethernet LAN for a maximum of 12 workstations, file server and instructor console.

Exterior

Exterior graphics package, full wrap and paint.

Rearview Camera System

Rearview camera system built into dash to provide assist in backing up vehicle.

Specialty Vehicles, Equipment and Accessories

Specialty Vehicles, Equipment and Accessories

1.1. Vehicle: Bookmobile

1.1.1. Unit shall be the latest manufactured current production (Year 2015 or 2016) with all standard components and details. Vehicle shall be new production as used models or demonstrator models will not be accepted.

To ensure uniformity and service in case of accident or major repairs, the manufacturer of the Bookmobile must construct the entire vehicle (with the exception of the chassis). No sub-contracting of the electrical system, module framing, body, interior, cabinetry, or paint finish is acceptable.

Vehicle shall comply with all Federal Highway Administration (FHWA), Department of Transportation (DOT), Federal Motor Vehicle Safety Standards (FMVSS), and Commercial Motor Vehicle Safety Standards (CMVSS) regulations, as well as State and Federal Codes.

1.2. Base Vehicle Specifications

1.2.1. Specifications below express the approximate size, type and configuration of the desired vehicle. Bookmobile offered should be substantially similar in size, quality, and shall include all listed features and modifications, if any.

SPECIFICATIONS	Comply Yes	Comply No
New vehicle (Model Year 2015 or 2016)		
BASIC VEHICLE DIMENSIONS:		
Width: approximately 96” exterior and 90” interior		
Height: approximately 84” interior and 11’6” exterior (including air conditioners)		
Length: approximately 24’ exterior and 16’ (load space) interior		
Wheelbase: approximately 176”		
Chassis: Ford E450, or approved equal, Super Duty Cut-A-Way		
120 Amp Alternator		

Front: 4,600 lbs. Twin-I-Beam front axle		
Rear: 9,450 lbs. Full floating rear axle		
Batteries: 12v-volt, 72 amp, and 650CCA		
Heavy duty power disc brakes – Anti-Lock Braking System		
Chrome front bumper		
6.8L EFI Triton V10 Engine, 305 HP@ 4,250 rpm, 420 lb. ft. torque at 3,250 with cruise control		
Stainless steel exhaust system		
Approx. 55 gallon fuel tank		
Gauges: voltmeter, temp, and oil		
Disposable oil filter		
GVWR: approximately 14,050 pounds		
Front springs: 4,600 lb. capacity front coil spring		
Rear springs: 9,600 lb. capacity single stage multi-leaf rear springs		
Front stabilizing bar		
Power steering		
Power locks for windows and doors		
LT 225/75R 16E All-Season SBR BSW tires		
5-Speed electronic automatic with overdrive (TorqShift) transmission		
16” wheels with chrome simulators		
Tinted safety glass windshield		
Utilimaster body type, or approved equal		
8” tread plate full step rear bumper		
CONSTRUCTION:		
“Z” shaped galvanized steel side posts on 16” centers		
3/16” diameter solid bucked rivets on 2” center		

Reinforced all steel rear frame, 10 gauge rear sill		
12 gauge rear corner posts		
.100 extruded aluminum top and bottom rails		
12” Aerodynamic front top radius of .063” aluminum		
Heavy duty aluminum front corner castings		
5” radius front corners, .100” extruded aluminum		
1 1/8” laminated plywood floor		
3” formed c-channel crossmembers on 16” centers		
.040 aluminum one-piece roof riveted on 2” centers		
1” anti-snag galvanized steel roof-bows on 24” centers		
Entrance door: 33” x 80” RV swing door with 22” x 13” glass window. Door will include a single stanchion with diagonal handrail to the stepwell on the interior of the vehicle and a 36” vertical handrail on the exterior of the vehicle.		
Wheelchair Lift door: Install a single lift door at the rear of the body.		
Cab heater, defroster, and air conditioner		
Single rectangular halogen headlamps		
All sidewalls and roof shall have a 1 5/8” foam insulation		
FMVSS 108 compliance		
Interior Mirror: One interior rear-view mirror will be included		
Exterior Mirror: One rear-view mirror will be installed on both the passenger and driver side. Two (2) backup wide angle exterior mirror, one mounted on each side of the top rear of the vehicle. Mirrors to be manual.		
Rubber mud flaps front and rear to be provided.		
Reinforced steel mud guards front and rear of all wheels. Floor to bottom skirt to be provided.		
Three (3) reflectors on each side, and two (2) on rear to be provided.		
Sun visors shall be provided for the driver and passenger.		
Welded Alumaframe superstructure		

Conventional undercoating applied to underbody.		

1.3. Conversion Specifications

1.3.1. Specifications below express the approximate size, type and configuration of the desired vehicle. Bookmobile offered should be substantially similar in size, quality and shall include all listed features and modifications, if any.

SPECIFICATIONS	Comply Yes	Comply No
Full graphics wrap package		
Two (2) extra double-sided, lockable book trucks		
Large Retractable screen located on exterior of vehicle to show movies, etc. using projector. Manual.		
Two (2) external outlet banks on two (2) sides of the vehicle for a total of four (4) units		
Awning (electric): Dometic A&E WeatherPro, or approved equal, electric awning will be installed on the curbside of the vehicle.		
Cabinetry (finish): All interior cabinetry shall be finished using a UV wood acrylate finish cured with Ultra Violet light—one sealer coat plus one topcoat, both cured to total dry thickness of .8 -1.0 mil. Finish shall contain 0% formaldehyde content, 0% VOC emission, and exceed AWI, NKB, and ANSI standards with a 30%-40% reflection level.		
Cabinetry (construction): All interior cabinets will be constructed using cabinet grade, hardwood veneer plywood. Plywood shall be constructed using cross-grain and long-grain Poplar and Fir core layers, sanded to ensure maximum smoothness.		
Interior cabinetry will be constructed from pre-engineered components produced by a CNC router, with accuracy to design of +/-.0001”. Component design files shall be kept by the vendor for a minimum of fifteen (15) years to allow for identical field replacement should such become necessary. All cabinet components shall be identified with a UPC bar code and written description to additionally facilitate this requirement.		

All exposed edges shall have a 3mm, hardened PVC edgeband applied to ensure durability and superior aesthetical qualities. Banding shall be applied using AD-20, EVA Ethylene – Vinylacetate based adhesive and using only machinery.		
Drawers and cabinets will include flush style positive latches. Desk will include a pencil drawer with marine latch. One drawer in each desk will be lockable. Final layout to be determined upon award of bid. Final design may include on or more built-in book drops.		
Front desk: A desk shall be installed at the front of the vehicle. Final design will be decided during pre-construction process.		
Closet: One (1) storage closet with bras coat hooks will be constructed.		
Shelving: MSV aluminum shelving specifically designed for Bookmobile application shall be installed. Two (2) wall huger detachable bookcarts will be included. Two (2) removable patron station will include a 120 volt and Cat 6 outlets.		
Ceiling: Kemlite L-1062, or approved equal, semi-rigid panel of fiberglass reinforced plastic (FRP). Ceiling will be covered with ½" Luann grade plywood, then covered with .075" FRP panel. Ceiling will be covered with one (1) continuous sheet, and no seams will be allowed.		
ELECTRICAL SYSTEM:		
AC Electrical System: System will be a 120/240 VAC system rated for anticipated conversion load. System will include 125A rated distribution panel configured with UL LED listed type magnetic/hydraulic circuit breakers. Circuit breakers will be sized per component manufacturer's recommendation or to 125% of anticipated load.		
System will be wired using EPM 12 gauge, 3-conductor (12/3), 600V rated, UL approved, multi-stranded boat cable. All wiring shall be color coded; black=hot; white=neutral; and green=ground. Additionally, wiring shall be labeled with machine-generated, self-laminating labels listing circuit number and/or designation at all termination points. All wiring shall adhere to applicable NEC and FMVSS regulations.		

Wiring shall be supported on 20” to 24” centers with insulated, non- conductive clamps. Wire bundles shall be tied with trimmed nylon ties. Extreme care shall be taken to prevent chafing, abrasion, and exposure to high heat. Wiring run in external areas shall be encased in conduit to further protect against damage.		
Five (5) 120 VAC duplex receptacles will be located according to final floorplan approved by the City.		
DC Electrical System: System will be a 12VDC, negative ground system rated for anticipated conversion load. System will include a distribution panel(s) using ATC fuses unless connected component manufacturer’s specifications require other. All added circuits shall be protected from over current by circuit breakers rated for a minimum of 125% of anticipated load. Circuit breaker functions shall be clearly designated by printed labels. Wiring shall be labeled with machine-generated, self-laminating labels listing circuit number and/or designation at all termination points.		
Auxiliary Battery System: System shall include one (1) deep-cycle battery, one (1) generator dedicated battery, and one (1) three-stage, fully regulated battery charger wired to the 110/240 VAC distribution panel, powered by the generator and/or shore cord mounted in an exterior compartment (or suitable alternative). Battery charger must be fully regulated to prevent battery overcharging.		
Charging system shall include provisions for automatic and manual battery bank merging to provide charging of chassis and auxiliary battery. System shall provide battery isolation during operation periods when the vehicle engine is not running to prevent depletion of both battery systems. Isolated senator battery to be provided.		
WIRING REQUIREMENTS:		
All high-current battery cabling shall utilize full-length cable runs sized to load. Splices are not acceptable. Terminal ends shall be crimped with manufacturer recommended tooling and sealed using color-coded wrap.		

All added wiring shall be supported on 20” to 24” centers, and bundles shall be tied with trimmed nylon ties. Entire system shall be installed to modern US automotive standards using best practices available at time of installation. Plastic grommets and/or dielectric sealants shall be used to protect wiring and/or looms where they pass through sheet metal, bulkheads, or structural supports. Convoluted polyethylene tubing shall be used to protect against chafing and abrasion where required. Extreme care shall be exercised to provide for easy serviceability of the system in future years. Extreme care shall be taken to avoid the engine manifold, engine exhaust, muffler, or any high-heat items that may subject the wiring to severe overheating during long periods of operation. These shall be the minimum acceptable wiring standards.		
Install commercial-grade PVC or rubber floor covering or 10- to 20-year commercial grade carpeting. City will choose from a selection of colors upon award.		
Custom floor plan designed and engineering using Computer Aided Drafting (CAD) technology. Floor plan will be provided on Size B paper and designed in 3/8” scale.		
GENERATOR:		
One (1) Onan Marquis, or approved equal, 7.0 kW Gas Generator will be installed. Generator fuel line will be tied into the existing chassis fuel tank. This fuel line will be installed approximately ¼ off the bottom of the fuel tank to assure that the chassis fuel tank cannot run out of fuel totally.		
An all-steel compartment will be designed and built to accommodate the required generator. The compartment will be securely tied into body framework to avoid damage to the compartment and the equipment by road vibration and road surface faults. Generator shall have double swing-out doors for ease of access. The doors will have ventilation panels of louvered metal installed as required to move air over and around the generator, away from air inlets, and meeting manufacturer’s requirements. The generator compartment must be insulated to maximum possible for elimination of heat, noise, and fumes to the coach area through walls and/or flooring without interfering with necessary airflow. Insulation of foil type will surround all possible areas of the generator compartment. The latches will be locking flush mounted latches, keyed alike.		
Generator stop, start, and hour meter will be located in the front interior of the vehicle.		

Air Conditioning: Two (2) 13,500 BTU roof mounted Coleman, or approved equal, air conditioners, 110 volt will be installed. Roof section to be reinforced where air conditioners are to be mounted.		
Heating: Two (2) electric fan forced air heats with variable control 1500 watts baseboard heats will be installed.		
Interior Lighting: 12-Volt LED lights placed down the center of interior ceiling, 12-volt stepwell light		
Exterior Lighting: One (1) Series 810 Scene-light mounted at entry door; Four (4) Series 810 Scene-lights will be mounted, one at each top corner of the bookmobile, front and rear		
SAFETY/SECURITY:		
• One (1) AudioVox, or approved equal, backup camera with monitor will be installed (microphone included).		
• One (1) Backup Alarm		
• One (1) 5 lb. fire extinguisher		
• One (1) first aid kit		
• One (1) set of triangle flares		
Shoreline Cord: Heavy duty rubber covered 120/240-volt shoreline cord to be provided, 25' minimum length. Transfer switch to prevent simultaneous use of generator and shoreline cord will be located in interior front of vehicle.		
½" Oak or Maple cabinet grade plywood walls will be installed.		
A Braun Millennium NL916-1B-2, or approved equal, interior wheelchair lift will be installed inside an enclosed cabinet with shelving full length of door.		

1.4. Technology Equipment Specifications

1.3.2. The Bookmobile shall be outfitted, at a minimum, with technology equipment as follows: Equipment shall be of commercial quality and shall include product brands that are well known and accepted in the industry. The City, in its sole discretion, shall determine whether the equipment offered is acceptable.

Bookmobile will be parked outside in the elements. Technology equipment provided must be able to withstand extreme temperatures of cold and heat.

SPECIFICATIONS	Comply Yes	Comply No
Public and staff wireless internet utilizing CradlePoint WiFi router MBR 1400 or approved equal		
Two (2) LCD TV's mounted to ceiling with adjustable arm, Samsung or approved equal. Size to be determined by contractor and approved by the City.		
CradlePoint WiFi router MBR 1400, or approved equal		
Audio system with internal and external speakers, audio inputs and control, and wireless microphone system		
External, lockable electrical outlets on the vehicle to facilitate devices being used during programming outside of the vehicle		
Two (2) staff notebooks/tablets, Latitude 12 Rugged Extreme Convertible Notebook or approved equal		
Fifteen (15) notebooks (Dell Latitude 13 (3340) or approved equal)		
Fifteen (15), iPad Air 2 or approved equal		
Two (2) Interactive smart short throw projectors (Epson BrightLink Pro 1430Wi Collaborative Whiteboarding Solution with Touch OR SMART LightRaise 60wi OR approved equal)		
Two (2) outdoor daylight projectors, Epson Home Cinema 3020 or approved equal		
One (1) Desktop 3-D printer, 3D Systems CubePro Trio, or approved equal		

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