

**Houston Community College System  
Procurement Operations**



**REQUEST FOR PROPOSALS (RFP)**

**FOR**

**Fire Apparatuses**

**PROJECT NO. 07-34**

# REQUEST FOR PROPOSALS

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**HOUSTON COMMUNITY COLLEGE SYSTEM**

**REQUEST FOR PROPOSALS - SUMMARY**

**Date:** May 21, 2007

**Project Title:** Fire Apparatuses

**Project No.:** 07-34

**ISSUED BY:**

Houston Community College System  
Procurement Operations  
3100 Main Street (11<sup>th</sup> Floor)  
Houston, Texas 77002

**SUBMIT INQUIRES TO:**

Name: Keith Reynolds  
Title: Buyer  
Telephone: (713) 718-5014  
Fax: (713) 718-2113  
Email: keith.Reynolds@hccs.edu

**Project Overview:**

The Houston Community College System ("HCC") is seeking proposals from qualified firms to Custom build, supply and deliver (F.O.B. Destination) Fire Apparatuses.

**Contract Approval:**

This Procurement is subject to approval by HCC Board of Trustees. Subsequent to Board approval, the only person authorized to commit HCC contractually is the Chancellor or designee.

**Pre-Proposal Meeting:** \_\_\_\_\_Mandatory \_\_\_X\_\_\_Not mandatory

A pre-proposal meeting will be held in the Purchasing Department, 3100 Main Street (11<sup>th</sup> Floor, Room #11A07) Houston, Texas 77002 on July 3 at 10:00am (local time).

**Proposal Due Date/Time:** HCC will accept proposals to provide the required Fire Apparatuses until 4pm (local time) on July 17, 2007. Proposals will be received in the Purchasing Department, 3100 Main Street (11th Floor, Room 11A06), Houston, Texas 77002.

**Delivery Point:** The vehicle shall be delivered to the following location/address:

Houston Community College  
Northeast College, Codwell Campus  
555 Community College Drive  
Houston, TX 77013

HCC is an equal opportunity/educational institution, which does not discriminate on the basis of race, color, religion, national origin, gender, age or disability.

HCC reserves the right to accept or reject all or any part of any proposal, waive any technicalities or irregularities in the proposal documents and consider the proposal for award.

This Request for Proposal does not obligate HCC to award a contract or to pay any costs incurred by a proposer in the preparation or submission of a proposal.

## **INSTRUCTIONS TO PROPOSERS**

### **1. Introduction**

HCC is seeking proposals under the negotiated method of procurement from qualified firms interested in providing Fire Apparatuses in accordance with the Specifications contained in this solicitation (Attachment No. 3).

### **2. Proposal Submittal**

Proposer(s) shall submit one (1) original and 6 copies of the technical proposal and 6 copies of the price proposal to the address shown below by the date and time specified in this solicitation. In addition to the technical and price proposal, each proposer must complete and return the following documents, if appropriate:

- Attachment No. 1, Proposal/Award Form
- Attachment No. 4, Determination of Good Faith Effort
- Attachment No. 5, Small Business Unavailability Certificate
- Attachment No. 7, Contractor & First Tier Subcontractor/Supplier Participation Form
- Attachment No. 8, Non-Discrimination Statement
- Attachment No. 9, Certification & Disclosure Statement
- Attachment No. 10, Affidavit Form
- Attachment No. 11, Business Questionnaire
- Attachment No. 12, Assurance of SBDP Goal
- Attachment No. 18, Conflict of Interest Questionnaire

The envelope containing a proposal shall be addressed as follows:

- Name, Address and Telephone Number of Proposer;
- Project Description/Title;
- Project Number; and
- Proposal Due Date/Time.

All proposals shall be submitted to the following address:

Houston Community College System  
Procurement Operations  
3100 Main Street (11th Floor)  
Houston, Texas 77002  
Ref: Project No. 07-34  
Attn:Keith Reynolds, Buyer

### **3. Eligibility for Award**

- a. In order for a proposer to be eligible to be awarded the contract, the proposal must be responsive to the solicitation and HCC must be able to determine that the proposer is responsible and has the resources and capacity to perform the resulting contract satisfactorily.
- b. Responsive proposals are those complying in all material aspects of the solicitation. Proposals, which do not comply with all the terms and, conditions of this solicitation will be rejected as non-responsive.
- c. Responsible proposers as a minimum must:
  - Have adequate financial resources, or the ability to obtain such resources as required during the performance of the contract.
  - Be able to comply with the required performance schedule, taking into

consideration all existing business commitments.

- Have a satisfactory record of past performance.
- Have necessary personnel and management capability to perform the contract.
- Be qualified as an established firm regularly engaged in the type of business necessary to fulfill the contract requirements.
- Certify that the firm is not delinquent in any tax owed the State of Texas under Chapter 171, Tax Code; signing and submitting the proposal is so certifying.
- Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

Proposer(s) may be requested to submit additional written evidence verifying that the firm meets the minimum criteria necessary to perform the requirements of the solicitation and be determined a responsible proposer. Failure to provide any requested additional information may result in the proposer being declared non-responsive, and the proposal being rejected.

### **Preparation of Proposal**

- a. **Technical Proposal Format:** The format may be either "portrait" or "landscape" with binding (wire or spiral) on the left long or short side and shall include, as a minimum, the below information. Include a table of contents with all pages numbered in sequence. Tab each section.
  - **Cover Sheet:** The cover sheet should contain the project title, project number and the name of the lead firm(s) submitting the proposal.
  - **Letter of Interest:** The letter of interest should not exceed 2 pages in length, summarizing key points in the proposal.
  - **Project Management and Services:** This section shall include the management and technical approach as well as a description of all services offered by the proposer. Include an organizational chart, which includes "key" staff members and their respective responsibilities for this project. Provide a detailed management plan with defined lines of authority and proposer's commitment to utilize HCC students in an internship capacity with the firm. Include production and delivery timelines.
  - **Qualifications and Experience of Firm:** This section shall include a description of the firm, including firm's history, size and staff composition. Include a description of the firm's past and current contracts/assignments, which are related to the type of services, required by this solicitation.
  - **Qualifications and Experience of Personnel:** This section shall include a project-staffing plan including resumes for all proposed "key" staff members who will be assigned to this project. If personnel substitutions are contemplated on a contingency basis, they should also be identified.
  - **Small Business Participation:** This section shall include a clear statement of the firm's commitment and plan to meet the small business goal specified in this solicitation.
  - **Internship Program:** This section shall include a clear statement of the firm's commitment to utilize HCC students in an internship capacity with the firm.
- b. **Price Proposal:**

The price proposal shall be clearly identified as such in the technical proposal documents. (Refer to Attachment No. 2, Schedule of Items and Prices).

5. **Evaluation Criteria**

An Evaluation Committee ("Committee") will review all proposals to determine which proposers have qualified for consideration according to the criteria stated herein. The committee's evaluations will be based on all available information, including qualification statements, subsequent interviews, if necessary, reports, discussions, reference checks, and other appropriate checks. The highest rated proposer(s) evaluated by the Committee **may** be invited to make an oral presentation of their written proposal to the Committee and/or the HCC Board of Trustees. Proposals will be evaluated using the following criteria:

| <b><u>FACTOR</u></b>                              | <b><u>Percentage Weight</u></b> |
|---|---------------------------------|
| • Project Understanding, Management and Services: | 30%                             |
| • Qualifications and Experience of Firm:          | 25%                             |
| • Qualifications and Experience of Personnel:     | 20%                             |
| • Small Business Commitment:                      | 5%                              |
| • Price Proposal                                  | 20%                             |
|   | Total: 100%                     |

6. **Contract Award**

Award will be made to the responsive, responsible proposer whose proposal conforms to this solicitation and offers the best value to HCC, price and other factors considered. HCC may award a contract, based on initial proposals received, without discussion of such proposals. Accordingly, each initial proposal should be submitted on the most favorable terms from a price and technical standpoint, which the proposer can submit to HCC.

7. **Postponement of Proposals Due Date/Time**

Notwithstanding the date/time for receipt of proposals established in this solicitation, the date and time established herein for receiving proposals may be postponed solely at HCC's discretion.

8. **Oral Presentations**

During the process of selecting a company to provide the required services, oral presentations may or may not be held. Each proposer should be prepared to make a presentation to HCC. The presentations must show that the proposer clearly understands the requirements of the solicitation, and has a strategic plan and approach to complete the work.

9. **Small Business Development Program (SBDP)**

- a. HCC has adopted a Small Business Development Program for small businesses attempting to provide goods and/or services as prime contractors or as subcontractors to other prime contractors to HCC. The program is designed to prevent discrimination by ensuring that small, underutilized and disadvantaged businesses are informed and prepared to compete for HCC procurements. HCC will neither discriminate nor select vendors on the basis of race, color, national origin, religion, gender, age or disability in its procurement selection process.
- b. Small businesses whose gross annual income averaged over the past three (3) years does not exceed the Small Business Administration's size standard as specified in 13 CFR Part 121 are eligible to apply for participation in the program.
- c. For this solicitation, HCC has established Best Effort as its goal for Small Business participation.
- d. **Good Faith Efforts:** HCC will make a good faith effort to utilize small businesses in all contracts. The annual program goals may be met by contracting directly with small businesses or indirectly through subcontracting opportunities. Therefore, any business that

contracts with HCC will be required to make a good faith effort to award subcontracts to small businesses. The subcontracting goal applies to all vendors regardless of their status. By implementing the following procedures, a contractor shall be presumed to have made a good faith effort:

- e. To the extent consistent with industry practices, divide the contract work into reasonable lots.
- f. Give notice to SBDP eligible firms of subcontract opportunities or post notices of such opportunities in newspapers and other circulars.
- g. Document reasons for rejecting a firm that bids on subcontracting opportunities.

10. **Small Business Compliance**

To ensure compliance with any stated small business participation goal, the selected contractor will be required to meet with the HCC Buyer and the HCC Small Business Representative at the 50% and 75% completion phases/dates of the project, to verify small business participation activity and to ensure compliance with the stated small business goal, if any.

11. **Prime Contractor/Contracts for Services**

The prime contractor must perform a minimum of 30% of any contract for services with its labor force and or demonstrate management of the contract for services to the satisfaction of HCC.

12. **Internship Program**

- a. HCC is expanding its student internship program. All vendors are encouraged to make a commitment to utilize certain HCC student(s) in an internship capacity with the company under any resulting contract for services required under this solicitation. The selected contractor will be expected to pay the student(s) at least the minimum wage required by law. HCC will provide the selected contractor with the name of student(s) eligible to participate in the internship program.
- b. For additional information regarding the internship program, please contact Dr. Freddie Wade, Director of Workforce Program Initiatives at (713) 718-7596.

13. **Prohibited Communications**

Except as provided in exceptions below, the following communications regarding a particular invitation for bids, requests for proposal, requests for qualifications, or other solicitation are prohibited:

- [1] Between a potential vendor, service provider, bidder, offeror, lobbyist or consultant and any Trustee;
- [2] Between any Trustee and any member of a selection or evaluation committee; and
- [3] Between any Trustee and administrator or employee.

The communications prohibition shall be imposed on the date that responses to the solicitation are due or received, whichever is first.

The communications prohibition shall terminate when:

- [1] The contract is awarded by the Chancellor or his designee; or
- [2] The award recommendations are considered by the Board at a duly-noticed public meeting.

In the event the Board refers the recommendation back to staff for reconsideration, the communications prohibition shall be re-imposed.

The communications prohibition shall not apply to the following:

- [1] Duly noted pre-bid or pre-proposal conferences.
- [2] Communications with the HCC General Counsel.
- [3] Emergency contracts.
- [4] Presentations made to the Board during any duly-noticed public meeting.
- [5] Unless otherwise prohibited in the solicitation documents, any written communications between any parties, provided that the originator shall immediately file a copy of any written communication with the Board Services Office. The Board Services Office shall make copies available to any person upon request.
- [6] nothing contained herein shall prohibit any person or entity from publicly addressing the Board during any duly-noticed public meeting, in accordance with applicable Board policies, regarding action on the contract.

14. **Drug Policy**

HCC is a drug-free workforce and workplace. The manufacture, sale, distribution, dispensation, or use of illegal drugs or alcohol by vendors or contractors while on HCC's premises is strictly prohibited.

15. **TAXES**

HCC is tax exempt as a governmental subdivision of the State of Texas under Section 501C (3) of the Internal Revenue Code. Limited Sales Tax Number: 1-74-1709152-1.

16. **Explanation to Proposers**

Any explanation desired by a prospective proposer regarding the meaning or interpretation of the solicitation documents must be requested in writing and with sufficient time allowed (a minimum of seven (7) calendar days before the date set to receive proposals) for a response to reach prospective proposers before the submission of their proposals. Any HCC response will be in the form of an amendment of the solicitation or an informational letter. The response will be made available to all prospective proposers via HCC website at [www.hccs.edu](http://www.hccs.edu). Receipt of any amendment(s) issued by HCC shall be acknowledged with the proposal submission.

17. **Texas Public Information Act**

HCC considers all information, documentation and other materials requested to be submitted in response to this solicitation to be of a non-confidential and/or non-proprietary nature, and therefore, shall be subject to public disclosure under the Texas Public Information Act (Texas Government Code, Chapter 552.001, et seq.) after a contract is awarded.

18. **Appropriated Funds**

The purchase of service or product, which arises from this solicitation, is contingent upon the availability of appropriated funds. HCC shall have the right to cancel the resulting contract at the end of the current fiscal year if funds are not allotted for the next fiscal year to continue the resulting contract. If funds are withdrawn or do not become available, HCC reserves the right to cancel the resulting contract by giving the selected contractor a thirty (30) day written notice of cancellation without penalty. Upon cancellation of the resulting contract, HCC shall not be responsible for any payment of any service or product received that occur after the end of the current contract period. HCC fiscal year begins on September 1 and ends on August 31<sup>st</sup>.

19. **Conflict of Interest**

If a firm responding to this solicitation knows of any material personal interest, direct or indirect, that any member, official or employee of HCC would have in the contract resulting from this solicitation, the firm must disclose this to HCC. Persons submitting a response to this solicitation must comply with all applicable laws, ordinances, and regulations of the

State of Texas Government Code. As applicable, the person submitting a response to this solicitation must complete and submit **Attachment No. 18, Conflict of Interest Questionnaire Form**. This completed form must be signed and submitted with the solicitation response.



**ACCEPTANCE AND CONTRACT AWARD FORM**

(Note: This page will be completed by HCC.)

-----  
Purchase Order No. \_\_\_\_\_ (for payment purposes only)  
Project No. 07-34  
-----

Contractor to perform the work required herein in accordance with Purchase Order(s) issued by HCC and the Terms and Conditions of Purchase posted on the HCC website at [www.hccs.edu](http://www.hccs.edu), incorporated herein by reference, and the prices, scope of services and general terms and conditions attached hereto and made a part hereof.

HOUSTON COMMUNITY COLLEGE SYSTEM

Executed for and on behalf of the Houston Community  
College System pursuant to approval by the Board of Trustees  
on \_\_\_\_\_, 2007

Signed By: \_\_\_\_\_

Name: Michael Kyme  
Title: Executive Director, Procurement Operations

**ATTACHMENT NO. 2**

**SCHEDULE OF ITEMS AND PRICES**  
For  
Fire Apparatuses

The Proposer/Contractor shall furnish all resources and services necessary and required to provide Fire Apparatuses, in accordance with the specifications, and the general terms and conditions of the sample contract documents for the price(s) listed below.

|     | <b>Description of Item</b>   | <b>Qty.</b> | <b>Unit</b> | <b>Unit Price</b> | <b>Total Proposed Price</b> |
|-----|--|-------------|-------------|-------------------|-----------------------------|
| 001 | American LaFrance Demonstrator 1500 GPM Pumper Fire Apparatus with Compressed Air Foam Capabilities or Equal | 1           | EA          | \$ _____          | \$ _____                    |
| 002 | Compressed Air Foam System 75' Quint (Fire Apparatus); American LaFrance or Equal.                           | 1           | EA          | \$ _____          | \$ _____                    |

Items being proposed: 1) \_\_\_\_\_  
2) \_\_\_\_\_  
(Manufacturer and Model No.)

**Brand Name or Equal Description:**

The Items listed herein have been identified as brand name or equal. This description reflects the minimum level of quality that will satisfy the needs of HCC. To be considered for award, proposals of "equal" products, including "equal" products, including "equal" products of the same manufacturer, must:

- 1) Meet the minimum quality of the brand specified, if any;
- 2) Clearly identify the item(s) by brand name, if any, and make or model number
- 3) Include, with the proposal documents, descriptive material to clearly show any modifications. Mark any descriptive material to clearly show any modifications.
- 4) HCC will evaluate "equal" products on the basis of information furnished by the proposer . HCC is not responsible for locating or obtaining any information not identified in the proposal document
- 5) Unless the proposer clearly indicates in its proposal that the product being offerd is an "equal" product, the proposer shall provide the brand product referenced in the solicitation, if any.

## **ATTACHMENT NO. 3**

### **Specifications**

### **FOR**

### **Fire Apparatuses**

**Item #1) American LaFrance Demonstrator 1500 GPM Pumper Fire Apparatus with Compressed Air Foam Capabilities**

**Item #2) Compressed Air Foam System 75' Quint (details follow below)**

#### **CUSTOM FIRE CHASSIS**

A custom cab and chassis shall be provided, designed and engineered specifically for fire service application.

#### **CUSTOM CAB AND CHASSIS SPECIFICATIONS**

The chassis shall be designed, engineered and manufactured by a professional truck builder with experience in producing and servicing Class 3 through Class 8 truck chassis. The manufacturer shall provide service and parts availability twenty-four (24) hours per day; seven (7) days per week via a franchised dealer employing certified truck and apparatus component service technicians.

The manufacturer shall provide a Customer Assistance Center manned twenty-four (24) hours, each day of the year by knowledgeable technicians who can provide service assistance by telephone and/or facsimile as well as locate the nearest available technician to provide specific apparatus component repairs whenever necessary.

The cab shall be specifically designed and engineered for the emergency vehicle market while the chassis shall be assembled in an ISO 9001 certified facility to insure the highest level of consistent quality components and assembly procedures are utilized in support of long service life with minimum maintenance.

#### **NO OVERALL HEIGHT AND LENGTH RESTRICTIONS**

There are no specific overall length or height restrictions for this apparatus.

#### **CHASSIS WHEELBASE**

The chassis wheelbase shall be two hundred eighteen (218) inches.

#### **FRAME**

The chassis frame shall be built with (2) heavy duty ladder type frames, each utilizing AISI 1527 Modified Manganese Steel, quenched and tempered with 125,000 psi ultimate tensile strength and 120,000 psi minimum yield strength.

Each rail shall measure 7/16" material formed to a "C" channel shape with 3-11/16" flanges x 11-1/8" web. The section modulus shall be 22.17 cubic inches per rail and the RBM shall be

2,660,000 pound/ inches, per rail. Each frame rail shall be mechanically punched for the components selected and shall bear the engraved vehicle serial number.

Cross members shall be formed steel and reinforced. Cross member spacing shall sustain the chosen Gross Vehicle Weight Rating, permit properly engineered installation of chosen chassis components and support a lifetime warranty against cracking of either rail in emergency vehicle service.

The rear of the frame shall be square and shall incorporate an inverted "Dog Bone" cross member allowing for service access between the frame rails to the top of the fuel tank from inside the rear compartment.

A "C" channel inner frame reinforcement shall be provided and installed. The inner liner shall be formed to a "C" channel shape to fit the contours of the mainframe rail without exceeding the flange width. The overall insert length shall be 3" plus the wheelbase plus the rear frame overhang in length.

Combined, the section modulus for the 7/16" frame shall be 31.38 cubic inches, per rail, and the RBM shall be 3,765,000 inch-pounds, per rail, with a yield strength of 120,000 psi, per rail.

### **FRAME FASTENERS**

The chassis frame shall be assembled with huck-spin round collar fasteners. The fasteners shall be installed with constant uniform torque and shall not loosen from vibration or require re-torquing.

### **ENGINE**

The engine shall be an electronically controlled, turbo charged, six (6) cylinder (four-cycle) Cummins ISL diesel engine developing 400 bhp at 2000 rpm. Peak engine torque shall be 1200 lb-ft at 1300 rpm.

The engine shall be 540 cubic inches (8.9 liter) displacement with a bore of 4.49 inches and stroke of 5.62 inches. The engine shall weigh dry 1,550 pounds without additional equipment.

The engine fuel delivery system shall consist of six (6) mechanical fuel injectors (EUI's), one (1) for each cylinder fed by and electronically controlled Bosch fuel system with "water in fuel" sensing. The engine shall utilize Cummins Interact System electronic management to control, diagnose and protect engine operation.

A 5-years/100,000 miles warranty includes internal components of the Cummins engine. An authorized Cummins distributor or authorized sales and service facility must conduct repairs. Claims shall be filed directly with Cummins by the selected contractor.

A combination full flow/bypass oil filter shall be provided with the engine.

### **STARTER**

The engine starter shall be a Delco Remy 12 volt 42MT with over crank protection (OCP) and thermal protection.

### **AIR COMPRESSOR**

The engine driven air compressor shall be a Wabco rated at 18.7 cfm airflow. The air compressor discharge line shall be stainless steel braid reinforced Teflon hose.

## **ENGINE COMPARTMENT LIGHT**

One (1) engine work light shall be installed in the engine enclosure.

## **AIR CLEANER**

The engine air cleaner shall be the size recommended by the engine manufacturer. The air cleaner element shall be manufactured from a fire retardant media and shall include an ember separator to resist flaming embers and shall be easily replaced by tilting the cab. The air cleaner shall be frame rail mounted on the right hand side of the engine.

The air cleaner intake shall be located on the right side of the cab, over the wheel well. The air intake bezel shall painted job color and be protected by a black wire mesh screen. It shall have a sealed system designed to prevent water from entering the intake pipe or air cleaner. The air cleaner shall include a moisture evacuator to allow discharge of condensation from the intake system.

## **AIR INLET / GAUGE**

A mechanical air inlet restriction gauge shall be visible through the in-cab service access door and it shall trigger a dash mounted warning light in the event of an air inlet restriction.

## **COOLING SYSTEM COMPONENTS**

The chassis shall be equipped with a high capacity down flow 1164 square inch radiator. The radiator core shall have (16) fins/inch with (3) rows of serpentine tubes made of copper, with header plates made of brass. The radiator top and bottom tanks shall be non-corrosive, high temperature composite that are swaged to the core.

The core shall be supported on both sides by a wrap around steel channel section with (2) lateral reinforcements between them. Each channel section shall be equipped with a gusseted mounting angle for attachment to a frame mounted, offset bracket, and a cantilever offset bracket for strut rod attachment. The mounting assembly shall dampen road shock and engine torque transmitted to the radiator.

The cooling system shall include a translucent surge and de aeration tank. This tank shall have a sensor to warn the driver of a low coolant level via a red warning light on the dash.

The entire cooling system shall be capable of maintaining engine manufacturers recommended engine operating temperature during all load conditions required by the engine manufacturer. The radiator core shall be compatible with all commercial antifreeze solutions.

## **COOLING FAN**

The nylon radiator cooling fan shall be controlled with a spring-on/air-disengage fan clutch. An automatic fan control shall be provided. The fan shall engage when the air conditioning system is on and for pumper vocations, when fire pump shift occurs. As head pressure builds up in the A/C compressor the fan will cycle on and off.

## **COOLANT HOSES**

The chassis shall be equipped with Gates "Blue Stripe" coolant hoses. Hose construction shall be with EPDM (Ethylene Propylene Dien Monomer). The hose wall construction shall reduce water permeation, decreasing radiator topping and coolant concentration imbalances. These hoses will provide a high durometer clamping surface to prevent cold seepage. Constant tension hose

clamps shall be provided for all coolant hoses of 5/8" diameter and greater.

### **HEATER HOSE**

The chassis shall be equipped with flexible hose plumbing to provide flow of engine coolant fluid to the front and rear heater cores. Formed hard line plumbing shall be used from the front of the cab back to the rear cab heaters. Lines shall be routed to prevent chafing or damage by other components of the apparatus.

### **COOLANT**

Engine coolant shall be heavy-duty pre-mixed ethylene glycol antifreeze. The engine coolant shall be treated with supplementary coolant additives (SCA's) as required by engine manufacturers. Engine coolant shall provide anti-freeze protection to -34 degrees Fahrenheit.

### **COOLANT FILTER**

The engine cooling system shall be equipped with a Fleetguard coolant filter with spin-on filter for collection of potentially harmful contaminants and their eventual build up on coolant system components.

### **ENGINE PROTECTION ALARMS**

The engine shall be equipped with an alarm system for low oil pressure, high coolant temperature and low coolant level. The system shall warn the driver or pump operator of a potentially damaging engine operating condition. This warning system shall not shut down the engine or reduce power under any conditions.

### **ENGINE START/STOP CONTROL**

The vehicle shall be equipped with a keyless ignition, three (3) position rocker switch, "Off/Run/Start" that shall be easily accessible to the driver.

### **TRANSMISSION**

The chassis shall be equipped with an Allison 3000 EVS-P, six (6) speed automatic transmission. The transmission shall be equipped with the following:

- Allison 4th Generation Controls and programmed for Fire Apparatus vocation
- Oil level indicator shall be provided
- 4th gear lock-up circuit for fire pump operation

The chassis to transmission wiring harness shall utilize Metri-Pack 280 connectors with triple lip silicone seals and clip-type positive seal connections to protect electrical connections from contamination without the use of coatings.

A 5- years/unlimited distance warranty includes internal components of the Allison transmission. An authorized Allison distributor or sales and service facility shall conduct the repairs. Claims are filed directly with Allison by repair facility.

### **TRANSMISSION PROGRAMMING**

The transmission shall be equipped with Allison 4th Generation Controls and shall be programmed for five (5) speed Fire & Emergency Vocational Package (120) split shaft pumper application.

## **TRANSMISSION SHIFT SELECTOR**

An Allison "Touch Pad" electronic shift selector shall be located on the forward left side of the engine enclosure in close proximity to the power on/off/start switch and the parking brake control.

## **TRANSMISSION OIL COOLER**

A water to oil transmission cooler shall be provided.

## **AUXILIARY BRAKE**

The engine shall be equipped with a Cummins C-Brake compression brake. The "Hi/Low/Off" switch shall be installed on the instrument panel. The engine brake shall interface with the Wabco ABS brake controller to prevent engine brake operation during adverse braking conditions. A pump shift interlock circuit shall be provided to prevent the engine brake from activating during pumping operation, if applicable.

## **FUEL SYSTEM COMPONENTS**

The chassis shall be equipped with a 54 gallon capacity rectangular fuel tank constructed of steel alloy with stamped heads. It shall provide a minimum of 54 gallon (204 liter) "draw" capacity on an incline in any direction up to 8 degrees. The fuel tank shall be certified to meet FMCSR 393.67 requirements.

Dual pick-up, dual return ports and dual fuel level sender ports with a single 3/4" tank draw tube shall be provided for possible future requirements. The bottom of the fuel tank shall contain a 3/4" magnetic drain plug that shall be recessed to prevent the plug from protruding from the bottom of the fuel tank.

The tank shall be mounted between and under the frame rails 55.5" aft of the rear most axle centerline when utilized with a rear mounted aerial device. Mounting shall include (2) steel straps protected against chafing the tank by form fitted rubber channels.

## **FUEL FILL**

The 54 gallon fuel tank shall be equipped with a 2" filler neck assembly with a 3/4" vent to prevent back splash at rapid filling rates and shall be located on the rear of the tank. The fuel fill cap shall have a lanyard.

## **FUEL LINES**

The fuel lines shall be high temp reinforced wire braid with ferrul nut brass fittings. The lines shall be carefully routed along the inside of the frame rails, protected against chaffing by non-conductive, frame mounted stand off fasteners. A fuel cooler will be provided to maintain the proper fuel temperature.

## **FUEL / WATER SEPARATOR**

A Alliance fuel/water separator shall be installed on the chassis frame rail. The filter shall be accessible, easily serviced, or replaced.

## **EXHAUST SYSTEM**

The engine exhaust system shall be a horizontal design with an aluminized muffler mounted under the right side frame rail. A horizontal tail pipe shall be provided extending the exhaust outlet to the forward side of the rear wheels, exiting the right side. All exhaust piping shall be protected

against damage from vibration, torque and frame flexing.

### **FRONT AXLE COMPONENTS**

The front axle shall be a Meritor model MFS-133A with a maximum beam and spindle capacity of 20,000 pounds. It shall be provided with oil lubricated wheel bearings seals and a clear oil level viewing window.

### **POWER STEERING PUMP**

The power steering pump shall be a Vickers V20.

### **PUMP RESERVOIR**

The power steering reservoir shall have a capacity of four (4) quarts of power steering fluid.

### **STEERING GEAR**

The steering gear shall be a TRW model TAS-85 with ram assist and rated at 21,500 pound capacity maximum. Steering geometry shall be capable of 45 degree cramp angle, minimum, in both directions limited only by specified tires and wheels.

### **FRONT SUSPENSION WITH SHOCK ABSORBERS**

The front suspension shall be a taper leaf design with a capacity of 20,000 pounds. Front spring bushings shall be graphite impregnated bronze spring pin with grease seals. Heavy duty, double acting shock absorbers shall be provided.

### **FRONT BRAKE COMPONENTS**

The front brakes shall be Meritor "Q-Plus" 16.5" x 6" cam type with a capacity of 20,000 pounds. Ferodo or equal non-asbestos brake shoe linings, specifically designed for fire and emergency severe service, shall be supplied. Automatic slack adjusters will be provided.

### **FRONT TIRES, WHEELS AND HUBS**

The front tires shall be Michelin XZY-3 "super single" radial tires with all position tread. The tires shall be 385/65R 22.5 18 ply and shall have a GAWR of 20,000 pounds.

### **FRONT WHEELS**

Front wheels shall be Alcoa 82364X 10-bolt, hub piloted aluminum disc, 22.5" x 12.25" with a maximum capacity of 22,000 pounds.

### **FRONT WHEELS**

Each front wheel outer surface shall be polished.

### **HUB AND LUG NUT COVERS**

Polished 304L Stainless steel axle hub and lug nut covers shall be installed on the front axle. The front axle covers shall include openings to view axle seal oil level.

### **REAR AXLE COMPONENTS**

The rear axle shall be a Meritor RS-30-185 with a fire and emergency rating of 31,000 pounds. The

axle shall include single reduction hypoid gearing and oil lubricated wheel bearings.

A gear ratio shall be selected for the specified drive train components to provide a top road speed of seventy (70) miles per hour (+/- 2 MPH).

### **REAR SUSPENSION**

The rear suspension shall be a self-leveling Reyco spring pack. The suspension shall have a capacity of 31,000 pounds. Rear spring bushings shall be graphite impregnated bronze bar pin end connections with grease seals.

### **AXLE SEALS**

The rear axle shall be equipped with appropriate oil seals based on the rear axle manufacturer and axle series.

### **REAR BRAKE COMPONENTS**

The rear brakes shall be Meritor "P" series 16.5" x 7" heavy duty cam type, equipped with Ferodo or equal non-asbestos brake shoe linings specifically designed for fire and emergency severe service and for application with a single drive axle. Brakes shall be equipped with double anchors and cast iron shoes. Automatic slack adjusters will be provided.

### **BRAKE CHAMBERS**

The rear brake service and parking chambers shall be properly sized based on the Gross Vehicle Weight Rating and type of brake selected.

### **BRAKE CHAMBERS**

Haldex spring set parking brake chambers shall be supplied with a dash mounted Bendix PB-1 yellow handle push/pull control located convenient to the driver and reachable by the officer. A light located in the driver's dash panel shall illuminate whenever the park brake is activated.

### **REAR TIRES, WHEELS AND HUBS**

Four rear tires shall be Michelin XDY-3 radial tires with drive position tread. The tires shall be 315/80R 22.5 20 ply, and shall have a GAWR of 33,020 pounds.

### **REAR WHEELS**

Four rear wheels shall be Alcoa 893600 aluminum 10-bolt, hub piloted disc, 22.5" x 9.00" with a maximum capacity of 36,000 pounds.

### **REAR WHEELS**

Each outer rear wheel, outer surface shall be polished.

### **HUB AND LUG NUT COVERS**

Polished 304L Stainless steel axle hub and lug nut covers shall be installed on the rear axle outer wheels.

### **DRIVE SHAFT**

A balanced drive line from the transmission to the rear axles shall be engineered to handle the combination of the engine and transmission torque and the resistance created by the GVW (gross vehicle weight) rating.

### **AXLE LUBRICANT**

The axles shall be equipped with a petroleum based lubricant.

### **AIR BRAKE SYSTEM**

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS-121 and the operating test requirements of NFPA 1901, shall be installed. The system shall be powered by an engine mounted, gear driven air compressor.

The air system shall be plumbed with reinforced, color coded nylon air brake tubing in conformance to SAE J844-94, Type B and US D.O.T. Standards. The compressor discharge shall be plumbed with stainless steel braided hose lines with a Teflon lining. Nylon air lines shall be enclosed in high temperature convoluted loom run along the inside frame rails, secured with non-conductive, corrosion resistant strapping mounted with stand-off fasteners. Cord reinforced rubber hose lines with brass fittings shall be installed from frame rail to axle mounted air connections.

A pressure protection valve shall be installed to prevent the use of air horns or other air operated devices should the air system pressure drop below 80 psi (552 kPa).

The chassis air system shall meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system. This system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

### **AIR DRYER**

A Bendix model AD-9 air dryer with heater shall be installed on the frame rails under the cab. The Bendix dryer shall be used to maintain the warranty coverage on Bendix brake system components, and shall provide an added 200 cubic inches of air capacity.

### **AIR TANKS**

The main system shall provide a minimum of 4860 cubic inches of air supply with not less than three reservoirs in accordance with FMVSS-121.

### **TANK DRAINS**

A Bendix heated automatic drain valve shall be installed on the wet tank. All other tanks shall be equipped with manual drain valves operated by stainless steel pull cables.

### **AIR BRAKE SYSTEM**

A Meritor Wabco, four-channel Anti-Lock Braking System with four-wheel sensors and four modulators to control and compensate braking force at each wheel shall be installed. A dash mounted diagnostic light shall be installed for servicing the system.

The system shall prevent wheel lock-up during braking thereby allowing the vehicle to accomplish a controlled stop while remaining substantially in the direction of travel at the time of brake application.

## **BRAKE LOCK SYSTEM**

An all wheel brake lock system shall be furnished and shall engage the front axle brakes only when the parking brake has been set with the engine running. It shall be a two valve system that utilizes a separate knob for activation, and releases with park brake release or loss of air pressure.

## **BRIGHT TRIM PACKAGE**

The cab shall have a bright trim package consisting of bright stainless steel mesh in the grill and in the wheel well air intake grates with surrounding trim painted cab color. Both lower step kick panel and upper step surface is aluminum diamondplate.

## **CUSTOM FOUR DOOR ALUMINUM CAB**

The cab shall be designed and engineered specifically for the rigors and ergonomics of emergency response. The cab and chassis shall be designed, engineered and assembled as a premium quality, integrated unit which provides for safe and comfortable entry and egress of firefighters properly clothed in full protective gear. Safe and comfortable transport shall be afforded each occupant who is properly seated, restrained and attentive.

The cab interior shall be styled by professional automotive designers. The interior trim shall be tooled to support repeatable high quality fit-up and appearance as well as serviceable component access. Interior surfaces shall be comfortable, easy to clean and long lasting under the rigors of contact with firefighter's clothing and personal safety equipment.

The cab and chassis shall meet and/or exceed all applicable FMVSS and FMCSR, Title #49, U.S. Code Requirements for vehicles domiciled in the United States and all applicable CMVSS and Canada Transport Regulations for vehicles domiciled in Canada. The cab shall have passed all load and impact tests required for compliance certification with United Nations Agreement, "Standard for Protection of Cab Occupants", Regulation #29. A copy of test reports shall be available upon request.

## **CAB CONSTRUCTION AND DIMENSIONS**

The cab shall be an aluminum structure utilizing tooled stampings of 3003-0 alloy in roof contour areas to prevent large zones of heat affected metal adjacent to welds. All metal joints shall be caulked. The cab design shall not require the use of body fillers to achieve smooth contours or flat surfaces.

The cab outer skin dimension shall be 95.5" from side to side and 134" front to back. With appurtenances including door hinges, fenders, cab trim, hand rails and warning lamps, the outer dimension shall be 99.5" and 119" overall width including mirrors. The cab length shall be 74" from the front wall to the front axle centerline and 60" from the front axle centerline to the back of the cab. The inside cab width between closed doors shall be 89.75".

There shall be a one piece, 1/4" thick, full height inner wall extending from the 1/4" thick front fire wall to the back vertical corner extrusion and shall extend from the roof side extrusion down to the bottom steps. All sheet and plate alloys shall be 5052-H32 and all extrusions will be 6061-T6.

The exterior surface of the rear cab wall shall be covered using .060" aluminum tread plate.

The cab width and length shall permit installation of two seats in the front portion and up to four SCBA seats in the rear portion. The rear cab section roof shall provide 62" clear standing room. The entire roof shall be aluminum, supported by formed hat section aluminum roof bows on 15" centers. The roof exterior shall be free of indentations and shall have a convex profile to provide water run off to the incorporated drip moldings over the doors.

## **CAB DOORS AND STEPS**

The cab shall have four-(4) side mounted, flush fit, barrier height doors, which are weatherproof, sealed and shall each have two-(2) hidden automotive type hinges, which allow the doors to open a full ninety-(90) degrees. Each door shall be 69.3" tall, by 32.5" wide and equipped with 5" wide interior paddle latches, and 8" wide, exterior grab handle style latches. These doors shall include exterior key locks (all keyed the same) and push/pull tab interior locks.

Each door shall be equipped with a nylon strap assembly to prevent doors from opening beyond ninety degrees. The strap assembly shall consist of four tabs, each 1-5/8" in width, cut from a single 3" wide web. The end of each tab shall return onto its center and shall be sewn to form a loop through which a 3/8" stainless steel pin shall pass on the door side and a 3/8" stainless steel pin shall pass on the jamb side. As the door is closed the center of the web strap shall fold into the jamb, hiding the strap and preventing equipment and apparel from catching on an exposed loop.

The cab shall be equipped with a bolt on, expanded aluminum diamond plate first step mounted under each door. The steps shall be contoured to the radius of the cab fender and shall protrude from the cab the same distance as the fender. The steps shall have exposed, safety grate. An enclosed second step shall be provided below the cab floor level. The first step shall be 8.5" deep x 26" wide and 20.75" from ground. The second step shall be 8.25" deep x 27" wide and 11.5" above the first step and 8.5" below the floor of the cab.

## **FRONT CAB SECTION**

The cab front shall be a curved, one piece streamlined design with a centered radiator air intake. A mesh screen shall be installed to provide radiator core protection from road debris.

The windshield base plane shall be set back from the front cab wall to permit an aerodynamic rearward sloping windshield and placement of wiper motor for optimal clearing surface area.

The windshield slope in combination with its proximity to driver and officer seating positions shall provide optimal upward visibility to identify overhead obstructions at scene locations. Additionally, the officer and driver shall be able to see the ground surface 11.5 feet in front of the cab.

## **CAB GLASS**

The cab doors and side windows shall have tinted automotive safety plate glass with solar management treatment to assist with the reduction of interior heat loading from UV penetration. The windshield shall be tinted laminated safety glass also with solar management treatment. The windshield shall be curved, two piece design, with replacement glass readily available from manufacturer's and dealer's stock. The chassis shall have dual heavy-duty bus, pantograph type, wet arm windshield wipers, driven by a single 4.5 million-cycle electric motor. The wipers shall have a dash mounted switch that provides a delay function for the wipers in the event of light rain, fog or mist.

The windshield shall be 3,370 square inches. Front door glass area shall be 779 square inches each. Rear door glass shall be 708 square inches each and sidewall cab glass between the front and rear doors shall be 370 square inches each.

## **SIDE CAB WINDOWS**

The cab shall have fixed side windows, one each side between the front and rear doors. They shall be tinted and include solar management treatment.

## **WINDOW REGULATORS**

The two front cab doors shall be equipped with electric window regulators. Each window shall be operated by heavy-duty switch located on the dash within easy reach of the driver and officer, when seated.

Two crew cab doors shall be equipped with electric window regulators. Each window shall be operated by a heavy-duty switch located at the rear of the engine tunnel, one each side, a second set of controls shall be located with the controls for the front cab door windows.

### **GRAB HANDLES**

There shall be four exterior grab handles, one at each cab door opening. The grab handles shall be 23-1/4" long, bright finish extruded aluminum with replaceable rubber insert grips. Four additional grab handles, one mounted at each of the "A" and "B" door pillars inside the cab, on the hinge side, shall be installed. The interior grab handles shall be 11" long and shall be vinyl covered. The grab handles shall be in compliance with NFPA 1901.

### **CAB MIRRORS**

There shall be two 16" high x 7" wide side mounted rear view mirrors. Both mirrors shall be heated and remotely adjustable by the driver. The mirrors shall have an aerodynamic design to reduce wind buffeting and resultant vibration. The mirror housings shall have a chrome finish and a single mounting clamp.

The doors shall be equipped with a 32" tall, tubular stanchion for the mounting of the mirrors. Each stanchion shall be mounted to the cab door frames with two "break-away" mounts, to help reduce the chances of damage. The mirror heads heat and motor function wire harness shall be placed within the tube of the stanchion to protect them from damage.

### **CAB MIRRORS**

The same aerodynamic design shall be incorporated into the 7" high x 7" wide parabolic convex mirrors, mounted below the primary mirrors on each side of the cab.

### **CAB FENDERS**

The cab shall be equipped with polished stainless steel fender extensions that fit into the radius of the cab fender well. The fenders shall provide protection against water and mud spray onto the cab from the front tires.

### **FRONT MUD FLAPS**

The front wheel wells shall be equipped with anti-spray mud flaps.

### **CAB TILT MECHANISM**

The entire cab shall tilt up, providing access to the drive train for maintenance and repair by a qualified technician. The cab shall pivot at the front, raised by dual hydraulic cylinders with hydraulic velocity fuses, which prevent excessive cylinder speed especially when lowering the cab. A push button control with plug-in tether cable shall be provided. The tether cable shall allow the operator to have a view of the area around the cab while the cab is in motion. Each cylinder shall have a remote cylinder lock to keep the cab from twisting on a single lock system. The cylinder lock release system shall be incorporated into the tether remote to give the operator the ability to stand away from the cabs movement.

A 12-volt motor driven pump with a self-contained hydraulic oil reservoir and a manual backup pump shall be provided to power the tilt system. A monitor light shall warn the driver if the cab is

not latched.

### **CAB MOUNTS**

The cab shall be supported at four points with rubber mounts. The front cab supports shall be pivot points to allow the cab to tilt to 35 degrees for service and maintenance. This tilt angle will provide access to the engine area forward of the front axle. The rear cab shall incorporate fixed rubber mounts.

All four mounting points shall be bolted directly to the mainframe rail.

### **12-VOLT POWER SUPPLY**

The alternator shall be a 270 amp Leece Neville model 4944A, engine driven via a multi-groove polyvee belt and shall be automatically tensioned. The alternator shall meet all applicable NFPA 1901 requirements for performance.

### **BATTERIES**

The battery system shall be a single system consisting of four group 31, 12 volt DC, heavy-duty, high cycle automotive batteries installed on reinforced rubber matting. The battery bank shall have a group rating of 4300 cold cranking amperes (CCA) at 0 degrees Fahrenheit and a reserve capacity of 800 minutes with a 23 amp draw at 80 degrees Fahrenheit.

The batteries shall have a red Master Power on/off switch in close proximity to the engine start switch.

### **BATTERY BOX**

The battery group shall be mounted under the crew cab left hand door steps on the side of the frame rails. The batteries shall be mounted on masticated rubber sheets.

A positive and negative post shall be installed on the lowest point of the side of the battery box, to provide jumpstart capability.

### **BATTERY CHARGE SYSTEM**

The chassis shall be equipped with a Kussmaul "Auto Charge Pump Plus" 1200 battery charger with air compressor. The charger output shall be rated for 40 amps at 12 volts DC for fast battery recharge. The air compressor output shall be .30 SCFM at 80 PSI, .35 SCFM at 60 PSI.

An AC/DC selector switch shall be provided for the air compressor to determine mode of operation. When the AC mode is selected, the air compressor shall operate only when the system is powered by 120 volts AC input. When the DC mode is selected, the air compressor shall operate whenever low air system pressure is detected.

The battery charger shall operate on 120 volts AC, and draw a maximum of 10 amps. The charger shall utilize remote voltage sensing to compensate charger output for voltage drop in the charging circuit. The charger shall have a cab mounted bar graph charge level indicator to indicate the charger state.

### **RECEPTACLE**

A Kussmaul Super Auto Eject shore line receptacle shall be provided. The auto eject receptacle shall be completely sealed preventing road dirt contamination and shall be mounted in the driver step well below the door. The electrical shore line shall be automatically ejected when the engine starter circuit is engaged. A yellow spring-loaded weatherproof cover shall protect the receptacle.

## **ELECTRICAL LOAD MANAGEMENT SYSTEM**

The chassis shall be equipped with an integral fire and emergency vehicle electrical package, which shall include the electrical requirements of the fire apparatus body and cab warning light devices, power distribution, load management, lighting administration, and interlock requirements as set forth and recommended by NFPA 1901.

The components of the electrical package shall be integrated into the system by an engineered wiring harness and interconnect system designed such that the system wiring, interconnects, warning control, load management, interlock system and associated documentation can remain unchanged regardless of the vehicle lighting and interlock configuration.

The electrical package shall include: An indicating interlock module; a programmable load management device; a warning light power distribution module and an information display with system diagnostic capabilities.

## **INTERLOCK CONTROL AND MONITORING MODULE**

The electrical package shall be equipped with an interlock module and monitoring system that can be readily configured to meet the interlock requirements of various PTO and pump configurations, without wiring modifications from the pre-engineered harness and interconnect system. The module shall consolidate all interlock signals, relays and indicators and shall attach to the harness system through connectors. Independent relays dispersed about the apparatus for the purpose of pump and throttle interlocks **shall not** be utilized.

The interlock module shall also control and indicate the following functions: Transmission lockup command, high idle control logic with adjustable speed potentiometer for electronic engines, engine run/starter lockout relay, select switch for foot throttle inhibit during pump operation, and cab and body "door ajar" indication with relay for "door open" alarm.

## **LOAD MANAGEMENT SYSTEM (LMS)**

The electrical package shall include an electrical load management system which will control the warning light switch bank, lighting system operational mode (scene/response), automatic high idle activation, NFPA recommended voltage monitoring, load sequencing, and load shedding functions. The system shall meet the requirements of various system configurations, without wiring modifications from the pre-engineered harness and inter-connect system. The LMS shall consolidate all load management signals, relays and indicators and shall attach to the harness system through connectors.

The LMS shall monitor the main battery bank and shall be capable of monitoring a second, independent battery or battery bank (if present). The voltage detected on each of the battery banks shall be displayed by the load management system.

The load management system shall be configurable so that any warning light or switch controlled by the system can be assigned or reassigned without additional wiring or modifications from the pre-engineered harness and interconnect system.

A control switch or device can be assigned a mode of operation. There shall be three possible modes of operation:

- 1) Scene Mode: The device can be turned "ON" only when the park brake is set.
- 2) Response Mode: The device can be turned "ON" only when the park brake is not set.

3) All Mode: The device can be turned "ON" without regard to park brake position.

A control switch or device can be assigned to be dependent, or not dependent, upon the Master Warning Switch. Devices that are not dependent on the Master Warning Switch will sequence "ON" when the vehicle power is turned on. Devices that are dependent on the Master Warning Switch will sequence "ON" when the Master Warning switch is turned on.

Any control switch or device can be assigned a priority level at which a given device is sequenced "ON" and "OFF" and at which point the given device is automatically shed (turned OFF) by the load management device during low system voltage conditions.

There shall be nine (9) levels of priority programmable for any given device connected to the load management system. Devices will be sequenced "ON" from priority 0 (P0) to priority 8 (P8). Devices will sequence off from P8 to P0. When load management is enabled, devices assigned P8 shall be shed first, while P1 is to be shed last. P0 devices shall not be shed by the load management control. Any control switch (or device) can be assigned two modes for reactivation: Automatic - The load will reactivate when system voltage increases appropriately. SHED HOLD - The load will not reactivate once it is shed.

The following load management functions shall be active whenever the chassis park brake is set:

The load management system shall be capable of activating the apparatus high idle system when the system voltage drops to an unacceptable level. The load management system shall activate the high idle feature before any devices are automatically shed OFF. The high idle function request from the load management device shall function only if the appropriate interlocks are present; that is, control of the high idle system is monitored and shall be superseded by the state of the interlock control module. The automatic high idle system shall be deactivated whenever the brake pedal is pressed, and shall remain inactive for two minutes thereafter to allow an operator to override the high idle function and return the engine to idle before pump or PTO engagement.

The load management system shall be capable of automatically turning off device loads when the system voltage becomes degraded. Loads will shed according to their assigned priority levels. Electrical loads will be turned off only after the system voltage drops to the given priority shed point for more than one minute. Once a load is shed, it shall remain off for a minimum of five minutes and until the voltage exceeds the given shed point by at least 0.2 volts (if it is programmed to automatically reset). If a load is programmed to remain off after it is shed, the given load shall remain off until the master switch is toggled, or a "power-on" cycle (POC) is initiated.

The following load management functions will be active in both scene and response mode. The load management system shall provide a low voltage output that meets the NFPA recommended timing and voltage levels. The load management system shall provide a warning if voltage measured on an attached secondary battery bank (or voltage source) falls below 11.9 volts. The load management device shall support a user configurable load management output. The output shall be capable of being set at any voltage between 10.5 volts and 15 volts. If the Set Point is selected below 13.8 volts, the output shall activate when the voltage drops to or below the desired Set Point; this shall allow the output to be utilized to activate an auxiliary device or alarm at a user defined point.

If the Set Point is selected at or above 13.8 volts, the output shall activate when the voltage rises to or above the Set Point; this shall allow the output to be utilized to activate an over-voltage alarm at a user defined point.

### **LOAD MANAGEMENT SYSTEM CONFIGURATION AND DIAGNOSTICS**

The load management system features shall be easily configured through an on-board configuration menu. The system shall display the settings for each independent switch

configuration and adjustable output.

The load management system shall provide visual indication of the following parameters:

|                       |                                  |
|-----------------------|----------------------------------|
| Operating mode        | Master warning switch status     |
| Main battery voltage  | Secondary battery voltage        |
| User set point value  | On/off indicator for each output |
| Output priority level | Load management enable input     |

### **POWER DISTRIBUTION SYSTEM**

The electrical package shall incorporate power distribution modules (PDM)s as an integral part of the electrical system to supply power to all loads controlled by the load management system, including all warning lights, the air conditioning system, and all interior lighting. Each PDM shall be able to switch current to circuits via plug-in replaceable relays. Plug-in automatic, self-resetting circuit breakers shall also be provided. To minimize failures and voltage drop, each PDM shall have no point-to-point wiring and shall include integral connectors so as to be a plug-in component in the electrical system.

### **ELECTRICAL LOAD MANAGER INTERLOCK**

The interlock module shall monitor and provide visual indication of the status (active/not active) and polarity (positive input/grounded input) of the NFPA related interlock inputs; pump/PTO shift switch, pump/PTO engagement switch, park brake switch and neutral switch.

The interlock module shall control and indicate the outputs for the following NFPA related interlock signals: Pump mode interlock, "Okay to Pump" and remote throttle interlock (pump panel throttle).

The interlock module shall also control and indicate the following functions: Transmission lockup command, high idle control logic with adjustable speed potentiometer for electronic engines, engine run/starter lockout relay, select switch for foot throttle inhibit during pump operation, and cab and body "door ajar" indication with relay for "door open" alarm.

### **CAB INTERIOR**

The front dash area shall be styled into two cockpits; one in front of the driver and one in front of the officer. They shall be separated by the insulated engine enclosure which shall have a contoured front, symmetrical with the dual cockpits. The center section of the dash shall bridge the engine tunnel and shall provide a central instrument and control panel, accessible to both officer and driver.

The center section also shall provide a generous service access for the main HVAC air ducting, dash mounted electrical power distribution modules, air brake control plumbing as well as the instruments and controls in the center dash.

Two padded vinyl visors shall be installed across the windshield.

Daily engine and transmission inspection and service checks shall be accessed from inside the cab. There shall be a hinged access door located at the rear of the engine enclosure. Fluids checked from inside the cab shall be engine oil, transmission oil, power steering fluid and windshield washer solvent. The engine enclosure shall be a flat rectangular shape with insulated ABS covering suitable for equipment mounting.

The driver's dash shall consist of an automotive styled, molded housing incorporating the main instrument and control panels with serviceable gauges, warning lamps and audio alarm. The instruments and controls shall be panoramically arranged for ease of locating, reading and

understanding.

The officer's dash shall consist of a contoured, molded housing incorporating two panels arranged panoramically.

The cab shall be completely insulated against heat and sound intrusion. The cab roof and rear wall shall be covered with closed cell foam insulation. The cab dash insulation shall be covered with ABS form-fit paneling. The cab floor shall be completely covered by an insulated non-slip vinyl floor mat. The floor shall be insulated to minimize exterior noise intrusion. Cab interior noise shall not exceed 80 dB at any seat position at 45 mph when the engine fan is not engaged.

### **DRIVER AND OFFICER INSTRUMENTS AND CONTROLS**

The following instruments and warning lights shall be installed in the center panel directly in front of the steering column:

|   |                                      |
|---|--------------------------------------|
| Cab Unlatched warning light                   | Alternator warning light             |
| Low Coolant warning light                     | Turn signal indicators               |
| Engine Air Filter Restriction indicator light | Headlight High Beam indicator        |
| Stop Engine warning light                     | Check Engine warning light           |
| Electric Tachometer with Hourmeter            | Voltmeter w/ warning light and alarm |
| Oil Pressure gauge w/warning light & alarm    | Electric fuel level gauge            |
| Electric Speedometer with Odometer            | Parking Brake Set indicator          |

Water Temperature w/warning light and alarm  
Transmission Temperature gauge with warning light and alarm  
Dual needle Air Pressure gauge with low air warning light and alarm  
ABS and ATC warning lights, Retarder warning light (when specified)  
Low Fuel Level and Water in Fuel warning lights

### **DRIVER'S LEFT CONTROL PANEL:**

|                              |                                     |
|------------------------------|-------------------------------------|
| Dash Lighting dimmer control | Mirror controls                     |
| Headlight switch             | Intermittent Wiper on/speed control |
| Floor Lighting switch        |                                     |

### **DRIVER'S RIGHT CONTROL PANEL:**

|                    |                      |
|--------------------|----------------------|
| Main HVAC controls | Transmission control |
|--------------------|----------------------|

### **DRIVER'S FLOOR AREA:**

|                                    |               |
|------------------------------------|---------------|
| Steering Column and Wheel Controls | Foot Throttle |
| Suspended Brake Pedal              |               |

### **CENTRAL DASH CONTROL PANEL:**

This panel shall be located between driver and officer and shall contain:

|  |   |
|--|---|
| Red Master Battery Power On/Off switch | Green Master Ignition On/Off/Start switch |
| Siren Control Panel                    | Parking Brake control                     |
| Horn/Air Horn Selector Switch          |   |

### **STEERING COLUMN AND WHEEL**

The steering column shall be a tilting and telescoping type, designed to collapse under impact.

The steering column shall be capable of telescoping up to 3", tilting up to 6" and shall have infinite adjustment within its range of operation. This shall be controlled by an air operated foot switch.

The steering column shall have a self-canceling turn signal switch with a headlamp dimmer switch, windshield washer switch and hazard flasher controls located in the control stalk.

### **STEERING WHEEL**

A 20" diameter padded charcoal gray steering wheel with a center horn button and two grip spokes shall be provided.

### **OVERHEAD CONSOLE**

An overhead console shall run the width of the cab above the windshield and shall have a flared center section which sweeps back between the driver and officer. It shall be designed into the cab's interior ceiling.

### **OVERHEAD CONSOLE**

There shall be an overhead switch panel accessible by the driver and officer with one master and ten rocker switch locations. The panel shall include one red flashing "Cab Door Ajar" warning lamp and an amber "Body Door Ajar" warning lamp. The warning lamps shall be activated if the parking brake is released while the engine is running.

### **OVERHEAD SWITCH CONSOLE**

The overhead switch console above the driver position shall house the aerial controls and indicator lights. This will include two 12-volt rocker switches, one for the aerial PTO and one for Ladder Power. There shall be indicator lights for Jacks Down, Left Jack Out and Right Jack Out for the aerial equipment.

### **GAUGE TYPE**

Dash gauges shall be black faced with white numbers and orange pointers and shall read in US measurements only.

### **INTERIOR CAB LIGHTING**

There shall be six overhead dome light clusters, each consisting of a red LED and a white incandescent flush mounted lamp. Each white lamp shall illuminate upon opening any cab door and each white or red lamp shall be operable from the seat positions when the doors are closed. The lights shall be activated by pushing directly on the light. A red courtesy light mounted under the dash at the driver and officer positions shall be controlled by a rocker switch mounted on the driver's instrument panel.

There shall be a single lamp with a red/clear lens installed in the center of each cab door lower panel. This lamp shall be automatically activated when the cab door is opened providing a red warning to approaching traffic and illuminating the cab step and ground. In compliance with NFPA 1901, there shall be a minimum of 96 sq. in. of reflective material installed on the interior lower portion of the cab doors.

### **AUXILIARY 12 VOLT OUTLETS**

There shall be two automotive 12-volt auxiliary electrical outlets with covers mounted on the central dash panel for accessory items. Automatic self-resetting circuit breakers shall also be provided.

## **HVAC SYSTEM**

The cab shall be equipped with a primary heater/defroster system with a fresh air inlet filter and air conditioning. The system shall provide environmental air treatment in accordance with published SAE standards. The defroster system shall include cold air returns across the top of the windshield to assist in the movement of air across the full height of the windshield without the necessity of auxiliary fans.

The heater and air conditioner shall have adjustable air outlets incorporated into the cab dash at torso and foot levels for optimum distribution of air. The front heater shall have a rating of 44,000 BTU/hour. The front air conditioner shall have a rating of 16,000 BTU/hour. Airflow shall be provided by a 380 CFM fan.

The primary heater and air conditioner re-circulation switch and manual air conditioner on/off controls shall be heavy duty truck design, utilizing large rounded surface knobs. The controls shall be located to the right of the driver forward of the transmission control for easy access by the driver.

## **AUXILIARY HEATING/AIR CONDITIONING**

An auxiliary (crew area) heating and air conditioning system shall be integrated into the design of the cab. The auxiliary air conditioner evaporator unit shall be mounted in an overhead ceiling console and shall be rated at 30,000 BTU/hour.

The auxiliary air conditioner will have four large adjustable louvered vents positioned on the back of the overhead console. The air flow shall be provided by a 577 CFM fan at the evaporator.

Two auxiliary heaters shall have a combined rating of 44,000 BTU/hour and shall be mounted one in each rear facing crew seat base. Air flow shall be provided by a 380 CFM fan at each heater. Both the auxiliary cooling and auxiliary heating systems shall be controlled by the rear crew persons.

The auxiliary heater/air conditioner shall have controls mounted on the rear of the engine tunnel.

## **AIR COMPRESSOR**

A Zexel (Seltex) refrigerant compressor shall be provided to power the primary and auxiliary air conditioner evaporators. The compressor shall be engine driven via a poly-groove power belt tensioned by a threaded rod.

## **CONDENSER**

A radiator mounted air conditioner condenser shall be provided and installed in front of the engine radiator.

## **HVAC SYSTEMS OPERATION**

The HVAC system shall be capable of and tested for cooling and heating a custom cab with a total open space of 360 cubic feet, and without occupants, to the following performance requirements:

The air conditioning systems shall reduce the in-cab temperature to 72 degrees Fahrenheit within 30 minutes from an ambient temperature of 110 degrees Fahrenheit and relative humidity, starting with a cold (ambient) engine.

The heating systems shall increase the in-cab temperature to 80 degrees Fahrenheit within 20 minutes from an ambient temperature of 0 degrees Fahrenheit, starting with a cold (ambient) engine.

### **SHADOW GRAY VINYL INTERIOR**

The cab interior shall be a medium gray color. Accent trim shall be medium gray. The following interior components shall be consistent in material and color:

The header and back wall shall be shadow gray padded vinyl.

The engine tunnel shall be molded in color shadow gray ABS.

The upper panel of the doors shall be molded in color shadow gray ABS.

The sun visors will be shadow gray padded vinyl.

All dash panels will be medium gray powder coated aluminum.

The overhead console shall be shadow gray molded composite.

The floor will have black non-skid vinyl mats.

The engine tunnel kick plates shall be gray powder coated aluminum.

The interior of each door shall have a soft touch ABS trim panel on the upper section. A stamped stainless steel kick plate shall be installed.

### **CAB SEATS**

The driver's seat shall be a Seats, Inc. Universal model high-back air suspension seat. The seat shall be readily adjustable by the driver in accordance with SAE J1517. The seat shall be positioned to accommodate a human in at least the 5th percentile female and 95th percentile male as defined in SAE J833. The seat shall be equipped with 9" fore/aft adjustment and vertical travel of 6".

### **OFFICER SEAT**

The officer's seat shall be a Seats, Inc. Universal SCBA with air suspension including 6" of vertical travel and full seat cushion, and a fixed 95 degree high seat back. The seat shall incorporate 9" fore/aft travel and 6" vertical travel.

### **REAR SEATING**

The rear cab area shall contain two Seats, Inc. Universal SCBA high back non-suspended rear facing seats. They shall be mounted behind the driver and officer seats. Each seat shall be equipped with dual head rests and a protective back panel.

### **REAR SEATING**

The rear cab area shall contain two forward facing high back non-suspended seats. The two seats shall be mounted at the back wall in the center of the cab. The seats shall be Seats Inc. Universal series and shall not include provision for SCBA.

### **AIR PACK BRACKETS**

Install (Quantity) Ziamatic air pack brackets with mechanical collision restraint arms and quick release lanyards for the SCBA seats in the cab.

### **SEAT COVERS**

All seats shall be covered with solid color flat finish 44 ounce flat vinyl.

### **SEAT BELTS**

All seats shall be equipped with red, three-point seat belts.

### **BUMPER WITH 12" EXTENSION**

The front bumper shall be 10" high, two-(2) rib contoured channel rolled from 10 gauge 304 stainless steel. It shall be highly polished and shall have edge protecting molded end caps. It shall be attached to a bolted frame extension 12" ahead of the center of the cab front.

### **ALUMINUM DIAMONDPLATE GRAVELSHIELD**

A 3/16" bright finish aluminum diamondplate gravelshield deck shall be provided for the extended front bumper.

### **FRONT TOW HOOKS**

Two-(2) painted tow hooks shall be mounted to the bottom flange of the frame rail extension at a position that maintains an angle of approach compliant to NFPA 1901.

### **FLUID CAPACITY PLATE**

A permanently mounted plate shall be installed in the driver's compartment. It shall identify the quantity and type of the following fluids used in the vehicle:

Engine Oil  
Engine Coolant  
Chassis Transmission Fluid  
Pump Transmission Fluid  
Pump Primer Fluid

Power Steering Fluid  
Cab tilt fluid (if applicable)  
Transfer Case fluid ( if applicable)  
Equipment Rack fluid (if applicable)  
Air Compressor system lubricant

Drive Axle(s) lubrication Fluid  
Air Conditioning Refrigerant  
Air Conditioning Lubrication

Generator system lubricant (if applicable)  
Front tire pressure cold  
Rear tire pressure cold

### **SEATING CAPACITY PLATE**

A permanently mounted plate shall be installed in the cab, specifying the quantity of personnel the cab is designed to accommodate.

### **VEHICLE INFORMATION TAG**

Installed overhead and in clear view of the driver shall be a permanently mounted engraved tag with the overall height, length and weight of the completed apparatus.

### **AERIAL DEVICE WARNING LABELS**

All aerial device warning and safe operation labels shall be permanently installed on the completed apparatus in accordance with NFPA 1901.

### **WARNING SIGNS**

Warning signs shall be affixed to the rear panel and crew cab prohibiting personnel against riding on the outside of the vehicle, and to ride only inside the cab on the seats provided with seat belts fastened.

Each seating position that is not designed to be used during transit will have a warning sign that says:

"THIS SEAT IS NOT TO BE OCCUPIED WHILE VEHICLE IS IN MOTION"

### **TESTING**

The apparatus pump shall be thoroughly tested by a certified, independent Third Party Testing Organization such as Underwriter's Laboratories, in accordance with the appropriate requirements of the latest edition of NFPA, Standard for Automotive Fire Apparatus.

Upon delivery, the Purchaser may elect to duplicate some or all of these pumping tests. The manufacturer shall include all required certification forms in the delivery package.

In event the apparatus fails to meet on-site delivery testing, second trials may be arranged within 30 days following first test failure. Such subsequent trials shall be final and conclusive and failure to meet these requirements shall be cause for rejection.

Failure to make changes deemed necessary by the Purchaser to make apparatus conform to any clause of the specifications within 30 days after notice to the manufacturer shall also be deemed cause for rejection of the apparatus. Permission to keep or store the apparatus by the Purchaser during the testing and re-testing period, if agreeable with manufacturer shall not constitute acceptance of the apparatus.

### **PUMP ENCLOSURE**

A freestanding, side control, pump enclosure shall be provided with a substructure constructed entirely of stainless steel tubing and 12-gauge 304L break-formed components. A pump enclosure constructed using carbon steel or any other mounting method is not acceptable

The cross members shall support the substructure and the exterior panels independently from the cab and body. The cross members shall be isolated from the frame rails using a minimum of four-(4) torsion mounts. The module shall be secured with angle brackets bolted to both the enclosure cross rails and the side of the chassis frame rails. This design is required to eliminate shift and stress on the pump enclosure, pump panels, and running boards.

A removable stainless steel service panel shall be installed on the right side of the pump enclosure.

Overall length shall be 50" from front to back, plus flex joints between the cabs, pump enclosure and apparatus body.

Overall width of the pump enclosure shall permit permanently mounting valves, siamese, or adapters without projecting beyond the outer edge of the running boards.

### **CONTROL AND INSTRUMENT PANELS**

Removable 12-gauge brushed stainless steel pump panels shall be installed. All items on these panels shall be functionally arranged. These panels shall have large cutouts with stainless steel trim collars for ease of service of side mounted suction and discharge valves without requiring disassembly of the lower side panels for routine maintenance.

There shall be a hinged gauge panel on the pump operator's side containing the master discharge and intake gauges as well as engine monitor gauges. Two-(2) adjustable grip latches shall be installed to retain the panel in the closed position.

The lower panel shall contain the individual line pressure gauges. All line gauges shall be functionally arranged. This shall eliminate confusion when operating and discharge valve and monitoring discharge valve pressures. All items shall be installed in accordance with NFPA 1901 standards.

A brushed stainless steel light hood shall be installed above the both side pump panels. Weldon 2-1/2" x 6" model 2025 clear lens lights shall be installed under each hood. A switch on the pump operator's panel shall control the lights. Other items as required by the specifications shall be functionally arranged on the panels.

Individual drain valve controls and master drain controls shall be located at the lower area of the side pump panels.

All items shall be installed in accordance with NFPA 1901 standards. Other items as required by the specifications shall be functionally arranged on the panels.

### **CROSSLAYS**

Two-(2) pre-connected crosslay compartments shall be provided. The crosslay divider shall be adjustable.

The flooring shall be removable sections of machine punched ventilated 3/16" thick aluminum material. The floors shall include cutouts for the swivel elbows to allow pre-connected hose to be deployed from both sides of the apparatus.

### **CROSSLAY CAPACITY**

Each of the crosslays shall accommodate up to 200' of 1-3/4" DJ pre-connected hose in a double stack.

### **CROSSLAY COVER**

One-(1) heavy-duty reinforced black vinyl snap-on cover with vinyl end flaps shall be installed over the crosslays.

### **STORAGE AREA**

The remaining area above the pump enclosure shall be used for miscellaneous equipment storage. The floor in this area shall be aluminum treadplate.

### **RUNNING BOARDS**

Two-(2) 3/16" embossed, non-skid aluminum treadplate running boards, shall be bolted to the pump enclosure substructure. Running boards shall be a minimum of 13" deep.

### **PULLOUT PUMP STEP - LEFT SIDE**

One-(1) pullout operator's step shall be provided under the left side pump panel step. This step shall be constructed of a steel tube frame with pull out slides and Grip Strut grating. A positive mechanical lock shall be provided to hold the step in both the in and out positions.

### **TAGS**

The intakes, discharges, drains, controllers and gauges shall all be function and color-coded using individual labels installed on the pump panel using the guidelines as established in the NFPA 1901 section. 16.9.1.

### **"NO STEP" TAGS**

There shall be "No Step" tags installed identifying the non-step surfaces in and around the area of the pump enclosure.

### **LIGHT HOOD FOR RIGHT SIDE PUMP PANEL**

A hooded light shield shall be installed above the right side pump panel. Lights shall be controlled by the pump operator's panel light switch.

### **PUMP COMPARTMENT WORK LIGHTS**

Two-(2) manually switched clear lens Truck-Lite 80 series 6" pump compartment work lights shall be installed one-(1) each side of the pump enclosure.

### **VALVE CONTROLS**

All push-pull valve control handles shall be twist lock type with chrome plated handles and bezels. The valve manufacturer shall supply all swing type valve control handles. Connecting linkage shall be minimum 1/2" diameter and installed in a manner that will not bind, and once set will not require further adjustment.

The swing type valve control levers shall be positioned up in the closed position and down in the open position for unobstructed view the discharge gauges when in use.

Any 3" and larger discharges or gated intakes shall have a speed regulated operating mechanism as per NFPA 1901 standards.

### **MASTER GAUGES**

The master pump intake and discharge gauges shall be 4-1/2" diameter Class 1 Sub-Z Interlube filled 30-0-400 PSI compound gauges, with black letters on a white background.

### **INDIVIDUAL LINE GAUGES**

All discharges 1 1/2" and larger shall be equipped with an individual 2-1/2" diameter Class 1 premium, Sub-Z Interlube filled 0-400 PSI discharge gauge with black letters on a white background.

### **AERIAL DISCHARGE LINE GAUGE**

The Aerial discharge shall be equipped with an individual 2-1/2" diameter Class 1 premium Sub-Z Interlube filled 0-400 PSI gauge, with black letters on a white background.

### **INFORMATION CENTER**

Installed at the pump operator's panel shall be a Fire Research TP100 Tachplus+ gauge and instrument panel with large LED displays to monitor the following:

Tachometer, numeric display  
Engine oil pressure, color coded bar graph display with alarm  
Engine coolant temperature, color coded bar graph display with alarm  
Battery voltage, numeric display with audible low/high voltage alarm  
Low fuel, numeric display  
Pump hours, numeric display

Visual and external audible warnings shall be provided for a monitored failure. The audible alarm can be canceled by pressing the silence switch.

The Tachplus+ system shall also provide information on pump operation hours, incident hours, and engine hours at the push of a button.

### **ELECTRONIC GOVERNOR CONTROLS**

Electronic governor controls system. Operate in either an RPM mode or PSI mode. The system shall include safety interlocks and pump cavitation protection features.

### **FAST IDLE**

A preset fast idle set at 1400 rpm (or as otherwise required) shall be included with the electronic engine. A control switch mounted on the dash panel shall activate the high idle feature.

### **WATER LEVEL GAUGE**

One-(1) Innovative Controls water level gauge shall be installed on the pump operator's panel. The gauge shall be easy to read with 14 color-coded lights showing water level in 1/4 increments. A flashing light indicates the level has dropped 1/4 of the tanks capacity. The sensor shall be a PVC pressure transducer in the cell.

### **FOAM LEVEL GAUGE**

One-(1) Class 1 Intelli-Tank foam level gauge shall be installed on the pump operator's panel. The gauge shall be easy to read with four-(4) ultra bright LED lights showing foam level in 1/8 increments. A flashing light indicates the foam level has dropped 1/8 of the tanks capacity. The sensor shall be an electronic pressure transducer externally mounted on the tank, eliminating the need for internal probes.

### **FOAM LEVEL GAUGES**

Two-(2) Class 1 Intelli-Tank foam level gauges shall be installed on the pump operator's panel. The gauges shall be easy to read with four-(4) ultra bright LED lights showing foam levels in 1/8 increments. Flashing lights indicate foam levels have dropped 1/8 of the tanks capacity. The sensors shall be electronic pressure transducers externally mounted on the tanks, eliminating the need for internal probes.

### **HAND RAILS, PUMP ENCLOSURE**

Two (2) 18" long extruded aluminum non-slip handrails with black rubber inserts and chrome plated stanchions shall be installed one (1) each side at the top of the pump enclosure. These handrails are provided to access top of pump storage areas and accessories.

## **FIRE PUMP**

A Waterous CSU single stage midship fire pump shall be installed. The pump shall be of a size and design and have the capacity of 1500-2000 gallons per minute (U.S. GPM), NFPA 1901 rated performance.

## **PUMP ASSEMBLY**

The pump body shall be close-grained gray iron and shall be horizontally split in two sections for easy removal of the entire impeller shaft assembly. Two-(2) piece design shall allow complete servicing from underneath without disturbing pump mounting on the chassis or piping mounted on the fire pump.

The pump impeller shall be bronze with double suction inlets, fully balanced, and of mixed flow design with labyrinth type-high efficiency wear rings. Wear rings shall be bronze and easily replaceable when needed.

The impeller shaft shall be stainless steel, accurately ground to size, and properly supported on each end by lubricated ball bearings. For ease of service, the impeller shaft shall be of two-piece construction, allowing the pump transmission to be removed from the pump body without having to disassemble either unit. The entire pump shall be cast, manufactured, and tested at the pump manufacturer's factory.

The entire pump, both suction and discharge passages, shall be hydrostatically tested at the manufacturer's facility to the performance specifications as outlined by the NFPA. Pump shall be free from objectionable pulsation and vibration.

## **DRIVE UNIT**

The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

The pump transmission shall be rigidly bolted to the pump body, and shall incorporate high strength, involuted tooth-form Morse Hy-Vo chain drive for smooth, quiet transfer of power. The drive unit shall be manufactured and tested at the pump manufacturer's factory.

Pump drive unit shall be of sufficient size to withstand torque of the drive train components 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.

## **FIRE PUMP INSTALLATION**

The pump shall be rigidly mounted to the chassis frame rails. Driveline analysis software shall be used to calculate driveline angles, taking into account the specific power train components, wheelbase, and pump location.

## **PRIMING PUMP**

One-(1) Waterous fully automatic solenoid actuated model VPES priming pump shall be of the positive displacement type, electrically driven and conform to standards outlined by the NFPA. One-(1) priming control shall both open the priming valve and start the priming motor. When operating, the primer is to be automatically lubricated from its own five-(5) quart capacity oil reservoir.

A lever activated manual override shall be provided to permit priming of the fire pump in event of electrical failure.

## **MECHANICAL SEAL**

The midship pump shall be equipped with a high quality, spring loaded and self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

## **PUMP MANUALS**

There shall be two-(2) pump operation and parts manuals supplied on CDs included with the apparatus.

## **FIRE PUMP PAINTING**

The fire pump will be painted black. This is to include all intakes, discharges, manifolds and associated valves.

## **FIRE PUMP WARRANTY**

There shall be a five-(5) year Waterous Pump Conditional Warranty. Please refer to Waterous Standard Limited Warranty Agreement for coverage details.

## **PRESSURE GOVERNOR**

A Fire Research PumpBoss pressure governor and monitoring display shall be installed on the apparatus pump operators panel and provide the following displays:

- CHECK ENGINE and STOP ENGINE warning LEDs
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments
- Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments
- BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments
- PSI / RPM setting; shown on a dot matrix message display
- PSI and RPM mode LEDs
- THROTTLE READY LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur by monitoring apparatus information, stored data, and program options when selected by the operator. The brightness of the displays shall be automatically adjusted for day or night viewing.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Engine RPM
- Pump Overheat
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- Low Engine Oil Pressure
- High Engine Coolant Temperature

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or

engine RPM variation shall occur when switching between modes. A control knob that uses optical technology shall adjust pressure or RPM settings. It shall be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center.

A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

### **INTAKE RELIEF VALVE**

There shall be one-(1) intake relief valve shall be installed on the intake side of the pump. This valve shall be preset to relieve at 125 PSI through 2 ½" plumbing terminating with a 2 ½" MNST coupling below the running board on the right side of the apparatus.

### **PUMP SHIFT CONTROL**

The midship fire pump shift control shall be an electric over air mechanism that shall be located on the right side of the steering column, and positioned in a location that is in close proximity to the transmission shift selector. The shift mechanism shall be wired into the vehicle interface module to interlock the engine rpm control, transmission direct drive hold mode, and pump engage.

The shift switch console shall consist of three-(3) indicator lights. This console shall include a green indicator light that shall be energized when the pump shift has been completed, and shall be labeled, "PUMP ENGAGED".

A second green indicator light in the driving compartment shall be provided and energized when both the pump shift has been completed and the chassis transmission is engaged in pump gear. The light shall be labeled, "OK TO PUMP".

Electronic signals shall be provided at the firewall to facilitate installation of a warning light at the pump operator's position, indicating when the chassis transmission is in the neutral position and the parking brake is engaged.

A third green indicator light in the driving compartment shall be provided and energized when the pump shift has been completely disengaged, and the chassis drive axle has been engaged, and shall be labeled, "ROAD GEAR".

### **PIPING**

Left and right side pump panel discharges shall be bolted directly to the discharge ports that are cast into the fire pump body for maximum flow efficiency.

A top of pump stainless steel manifold shall be installed to feed all auxiliary or non-rated discharges. All piping and fittings 1-1/2" through 3" shall be high-pressure flexible piping with stainless steel couplings or Schedule 40 stainless steel. Where large diameter piping is required, Schedule 10 stainless steel will be utilized.

Wherever possible, piping shall be flange bolted directly to the multiple port openings on the fire pump body. For ease of service and longer life of plumbing, Victaulic couplings shall be utilized where necessary.

### **MASTER DRAIN VALVE**

A master drain valve shall be installed and operated from the pump panel area. The valve shall be located lower than the main pump body.

### **DRAINS**

Individual drain/bleeder valves shall be Class 1 quarter turn style, labeled per NFPA standards for 2" and larger lines.

### **TANK FILL, 1-1/2"**

A 1-1/2" full flow pump to tank fill/pump bypass line shall be controlled at the pump operator's panel. The plumbing from the valve to the water tank shall be high-pressure flexible hose with stainless steel couplings. The tank fill fitting in the specified water tank shall be sized to accommodate this valve.

### **TANK TO PUMP**

One-(1) 4" full flow wafer valve shall be installed between the tank and the pump. The valve shall be air operated with a control on the pump operator's panel.

### **ENGINE COOLER**

One-(1) Auxiliary heat exchanger shall be provided for added engine cooling during pump operation. The auxiliary engine cooler shall be mounted directly behind the radiator tank and shall use water from the fire pump during pumping operation. The radiator plumbing shall include a draincock for coolant evacuation.

The control valve for the heat exchanger shall be located on the pump operator's panel, and shall be a Class 1 quarter turn ball valve with chrome-plated handle and an "Auxiliary Cooler" identification tag recessed into the face of the handle.

### **PUMP COOLER**

The pump shall have a bypass cooler line installed from the discharge side of the pump to the water tank to cool the pump during sustained period of operation when water is not being discharged.

The pump cooler control valve, located on the pump operator's panel, shall be a Class 1 quarter turn ball valve with chrome plated handle and "Pump By-Pass" identification tag recessed into the face of the handle.

### **PUMP RATING**

The pump shall be certified to meet the delivery listed, from draft, through 6-inch suction hose at a maximum elevation of 2000 feet:

|      |       |         |
|------|-------|---------|
| 2000 | GPM @ | 150 PSI |
| 2000 | GPM @ | 165 PSI |
| 1400 | GPM @ | 200 PSI |
| 1000 | GPM @ | 250 PSI |

### **INTAKE, MAIN, 6" LEFT**

One-(1) 6" NST main non-gated inlet shall be installed on the left side of the pump. This inlet shall

be equipped with a removable screen and long handled cap.

#### **INTAKE, MAIN, 6" RIGHT**

One-(1) 6" NST main non-gated inlet shall be installed on the right side of the pump. This inlet shall be equipped with a removable screen and long handled cap.

#### **INLET, AUXILIARY, LEFT PANEL, 2-1/2"**

There shall be one-(1) 2 1/2" gated intake located on the left pump panel, in the rear position. The Akron, full flow, intake valve shall be located behind the panel and controlled at the valve with a swing handle. This inlet shall terminate with a chrome 2 1/2" Female NST swivel, strainer, plug and chain. A 3/4" 1/4 turn bleeder for this intake shall be located in the bleeder/drain panel.

#### **DISCHARGE, 2 1/2" LEFT PANEL**

One-(1) Waterous 2-1/2" full flow, straight (no elbow) discharge valve shall be located at the left side forward area of the pump enclosure and direct connected to the discharge side of the pump. The valve shall be controlled from the pump operator's panel and shall terminate with a 2 1/2" male NST coupling with a cap and chain. A 3/4"- 1/4 turn bleeder for this discharge shall be located in the bleeder/drain panel.

#### **DISCHARGE, 2 1/2" LEFT PANEL**

One-(1) Waterous 2-1/2" full flow, straight (no elbow) discharge valve shall be located at the left side rearward area of the pump enclosure and direct connected to the discharge side of the pump. The valve shall be controlled from the pump operator's panel and shall terminate with a 2 1/2" male NST coupling with a cap and chain. A 3/4"- 1/4 turn bleeder for this discharge shall be located in the bleeder/drain panel.

#### **DISCHARGE, 4" RIGHT PANEL, ELECTRIC**

One-(1) Akron 4" full flow, discharge valve shall be located at the right side forward area of the pump enclosure and direct connected to the discharge side of the pump. This discharge shall be electrically activated from the pump operator's panel complete with color coded valve position indicator lights and terminate with a 4" male NST coupling with a rocker lug cap. A 3/4"- 1/4 turn bleeder for this discharge shall be located in the bleeder/drain panel.

#### **DISCHARGE, 2 1/2" RIGHT PANEL**

One-(1) Waterous 2-1/2" full flow, straight (no elbow) discharge valve shall be located at the right side rearward area of the pump enclosure and direct connected to the discharge side of the pump. The valve shall be controlled from the pump operator's panel and shall terminate with a 2 1/2" male NST coupling with a cap and chain. A 3/4"- 1/4 turn bleeder for this discharge shall be located in the bleeder/drain panel.

#### **DISCHARGE, CROSSLAY**

One-(1) Akron 2" valve and full flow plumbing shall be piped to a 1-1/2" NST male swivel elbow to crosslay bed number 1.

#### **DISCHARGE, CROSSLAY**

One-(1) Akron 2" valve and full flow plumbing shall be piped to a 1-1/2" NST male swivel elbow to crosslay bed number 2.

### **AERIAL DISCHARGE, 4"**

A four-inch (4") discharge with a 3" ball type valve shall feed the pre-piped aerial water system.

This discharge shall be gear-operated hand wheel from the pump operator's panel, complete with position indicator.

A 3/4"- 1/4 turn bleeder for this discharge shall be located in the bleeder/drain panel.

### **DISCHARGE MATERIAL**

The discharge piping shall be full flow 4" schedule 40 black iron pipe.

### **ADAPTER, STORZ**

One-(1) 4" NST swivel female x 5" Storz 30 degree elbow adapter with a blind cap and retainer cable shall be installed on the 4" discharge.

### **FOAM SYSTEM, COMPRESSED AIR**

The pump shall be equipped with a Waterous Eclipse 200 CFM fully integrated compressed air foam system (CAFS). The CAF system shall be piped to provide foam solution, or compressed air foam to the three (3) discharges. The complete CAF system shall be installed in strict compliance with Waterous and FoamPro guidelines.

### **AIR SYSTEM AND CONTROLS**

The air compressor shall be rotary screw type, driven by the fire pump transmission, and operated by a pneumatic activated "hot shift" clutch controlled from the pump operator's panel. The air system shall include an Auto-Sync Balancing System four-way pump operator control module. The compressor shall be oil lubricated, including a spin-on filter, low oil warning system with red light and audible alarm, and a copper/brass heat exchanger cooling system that operates with water from the fire pump as a heat exchanger.

In addition to air compressor use for the CAF system, the compressor shall have the capability to be used strictly as compressed air for using air tools, filling air bags, utility air hose reels, etc.

The following air system controls shall be provided on the pump operator's panel:

Air compressor clutch switch with "On" indicator light.

Auto-Sync control module with "Auto/Manual, Run/Unload" and engraved instruction plate.

Air compressor temperature gauge with warning light and alarm.

CAF system air pressure gauge.

Digital air flow meter to show SCFM.

An "On/Off" air switch for each of the discharges piped for compressed air foam solutions.

### **FOAM SYSTEM AND CONTROLS**

Furnish and install a FoamPro 2002 electronic, fully automatic, direct injection, discharge side of pump foam proportioning system. The system shall be designed for Class A and Class B foam concentrates, producing 1000 GPM using 0.5% concentrate setting at 150 PSI.

A FoamPro "A-B" dual tank selector valve with flush control shall be installed at the pump panel.

Foam proportioning shall be automatically based on direct measurement of water flows in the water/foam discharge manifold that supplies the pre-connected discharges. The sensor shall be a paddlewheel type flow meter installed in the manifold. Full flow check valves shall be installed to prevent foam contamination in the fire pump and/or water contamination in the foam tank.

The pump operator foam system control shall be a digital computer push-button module with LED digital displays. Functions include:

Foam setting adjustments from 0.1% to 3.0% in 0.1% increments.

Show current GPM of water flow.

Show total volume of water discharged during and after foam operations.

Show total volume of foam concentrate used.

Simulate flow rates for manual operation.

Perform setup and diagnostic functions for system microprocessor.

Show "low concentrate" warning as foam level runs low.

Flash "no concentrate" when foam tank is empty, shutting down the foam injection pump system to prevent pump damage.

The foam injection pump shall be 12 volt motor driven, rated for 5 GPM at up to a maximum pressure of 400 PSI. Pump speed and injection rate shall be automatically controlled by the readings of the pump operator's control module.

Included at the pump operator's control panel shall be a system operation instruction plate, and a plate showing the foam system piping schematic.

#### **FOAM SELECTOR VALVE, DUAL TANK SYSTEMS, MANUAL**

There shall be a foam selector installed to allow the selection of either foam tank "A" or "B". The valve shall be manually controlled and include a feature that shall flush the valve between tank selections.

#### **FOAM TANK**

A 20 gallon polypropylene foam tank, with vented fill tower, strainer, and drain shall be installed inside the main water tank on the apparatus. The water tank size shall be increased to compensate for the area required for the installation of the internal foam tank.

#### **FOAM TANK**

A second 20 gallon polypropylene foam tank shall be installed inside the main water tank on the apparatus. The water tank size shall be increased to compensate for the area required for the installation of the internal foam tanks.

#### **WATER TANK**

The booster tank shall be 450 gallon capacity, constructed of polypropylene plastic.

Tank to be shaped to provide for deep side compartments and to serve as a large sump to limit the amount of undraftable water. The joints and seams shall be nitrogen welded inside and out. Tank to be baffled in accordance with NFPA bulletin 1901 requirements. The baffles shall have vent and air hole openings at both the top and bottom of each baffle to permit movement of air and water between compartments. The longitudinal partitions shall be constructed of .38" polypropylene plastic and shall extend from the bottom of the tank through the top cover to assure positive welding. The transverse partitions shall extend from the bottom to the underside of the top cover. All partitions shall interlock and shall be welded to the tank bottom and sides.

The tank cover shall be constructed of .50" polypropylene and incorporate a three-piece design which will allow for individual removal of just one section. The cover shall be recessed .38" from the top of the tank and shall be welded to the tank sides and the longitudinal partitions. Each section of the cover shall be supported to keep the cover rigid during fast filling conditions. Construction shall include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels shall be drilled and tapped to accommodate lifting eyes.

The tank shall be designed with a sumpless water pickup that is NFPA complaint.

The tank shall have a combination vent and fill tower. The fill tower shall be constructed of .50" polypropylene and large enough to accommodate the overflow tube and an open butt end of a 2-1/2" fire hose. The fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover. A 4" polypropylene overflow pipe shall be installed approximately halfway down the fill tower and extend through the bottom of the water tank.

The tank shall be mounted in accordance to the manufacturer's recommendations. Tank lifting devices shall be provided to enable removal of the tank from the apparatus should the need arise.

The tank shall have an internal deflection shield for the tank fill line and a 3" clean-out plug for ease of cleaning the tank interior.

The tank shall be furnished with a lifetime warranty.

### **APPARATUS BODY CONSTRUCTION**

The apparatus body and body mounting shall be designed to allow for severe flexing during road travel and aerial firefighting operations as experienced in the fire services. The main body shall consist of a driver and curb side compartments, front and rear body assemblies welded into a complete body unit prior to mounting on the apparatus.

However, welding shall not be employed in a manner that prevents the body removal for service or repair.

Any body finish paint shall be completed prior to the body being mounted onto the aerial torque box mounting system to increase corrosion protection.

### **BODY MOUNTING**

The body mounts shall be incorporated into the aerial ladder torque box assembly to provide a rigid support network for the complete body unit. The mounts shall be designed into the original torque box assembly and mounted prior to any finished painting to minimize corrosion.

The body mounts shall be fabricated from body material formed and structural components shall also be incorporated into the complete body unit prior to it being finish painted. All mounting areas shall be reinforced to distribute the load over a larger area.

## **BODY FABRICATION**

All compartments shall be ventilated to allow air circulation in and out of the closed compartment.

All compartment floors shall be designed with the lower door opening flange bent down to produce a sweep out compartment design. A step up flange at the compartment door opening shall not be acceptable due to difficulties in cleaning the compartments and the possibility of water being entrapped within this recessed area.

Each lower compartment floor shall be reinforced by a formed channel welded to the underside of the compartment floor to provide maximum strength.

Each body compartment assembly shall be manufactured from 1/8" aluminum, using modern sheet metal fabrication techniques to ensure maximum longevity and corrosion resistance.

## **EXHAUST HEAT DEFLECTOR**

A stainless steel heat deflector shall be provided over the exhaust piping where the exhaust piping passes below the apparatus body.

## **COMPARTMENTATION DETAIL**

The approximate compartment sizes and locations shall be as follows:

### **DRIVER SIDE**

There shall be a compartment "L1" ahead of the rear wheels, 57.50" wide x 61.00" high x 24.00" deep. The minimum door opening shall be 55.00" wide x 52.50" high with a roll-up style door.

There shall be a compartment "L2" above the rear axle and outrigger which shall be 81.50" wide x 25.00" high x 24.00" deep. The minimum door opening shall be 79.00" wide x 16.50" high with rollup style door.

There shall be a compartment "L3" behind the outrigger which shall be 33.00" wide x 61.00" high x 24.00" deep. The minimum door opening shall be 30.50" wide x 52.50" high with a roll-up style door.

### **CURB SIDE**

There shall be a compartment "R1" ahead of the rear wheels, 57.25" wide x 61.00" high x 24.00" deep. The minimum door opening shall be 54.50" wide x 52.00" high with roll-up style door.

There shall be a compartment "R2" behind the outrigger which shall be 33.00" wide x 33.00" high x 24.00" deep. The minimum door opening shall be 30.00" wide x 24.00" high with a roll-up style door.

## **ROLL-UP COMPARTMENT DOORS**

The apparatus body shall be provided with Roll-O-Matic Robinson shutter type roll-up compartment doors. The compartment doors shall be constructed from anodized aluminum rectangular extrusions with each slat of the door individually replaceable to reduce repair costs and down time of the vehicle.

Inner seals between each slat of the compartment door shall prevent vibration of the compartment door and assist in preventing dirt and water from entering the compartment.

One piece extruded aluminum flanges with heavy duty rubber seals shall be installed on each side of the compartment door assembly to eliminate the space between the compartment side walls and the door assembly. The side extrusions shall also provide the side slide tracks of the door assembly for smooth operation without binding. An extruded aluminum drip rail with internal rubber seal shall be provided along the top edge of the compartment door. In addition, a bottom door seal shall be installed to provide a fully weatherproof compartment.

A full width aluminum lift/latch bar shall be provided on the door assembly with a bar catch installed on each side of the side track extrusion sections. A heavy duty aluminum angle shall be installed directly above the lift bar to assist in the closing of the compartment door and to ensure door operation with one hand.

Each roll-up compartment door shall have a satin finish.

### **OUTRIGGER CONTROL STATION DOOR**

A polished stainless steel door shall be provided at each outrigger control station. Each door shall be furnished with a trigger latch.

### **FUEL FILL**

A Cast Products aluminum fuel fill pocket with brushed finish cast aluminum hinged access door with spring loaded opener shall be installed on the street side of the body in the corner access step area. The door shall be labeled for "Diesel Fuel".

### **REAR GROUND LADDER ACCESS**

One (1) 1/8" aluminum treadplate lift-up hinged door shall be provided at the center rear of the apparatus to assist in keeping dirt from drafting into the rear ground ladder/storage area and restrict ground ladder movement. The door shall be provided with two (2) gas spring stay arms and "D" ring bent-handle style latch assembly.

A 12 VDC distribution area for both the body and aerial shall be located under a hinged treadplate cover directly behind the turntable.

### **WHEELWELL LINERS**

Each rear wheelwell of the body shall have a one-piece full width wraparound wheelwell liner with extended radiused highly polished stainless steel fenderette. The wheelwell liner shall be bolted to the body to permit easy removal for service and maintenance. Ample clearance shall be provided between the tire and wheelwell liner for the use of tire chains.

### **MUD GUARDS**

Heavy-duty mud guards shall be provided behind the rear wheels, overlapping each side of the tires.

### **BODY TRIM**

All aluminum treadplate installed on the apparatus body shall be "bright finish" with a minimum 1/8" thickness. For corrosion resistance, aluminum treadplate shall not be installed prior to paint as described in the painting section of this specification.

Aluminum treadplate shall be installed on the entire rear surface of the apparatus, front wall of the forward body compartments, the vertical wall of the water tank enclosure and the top of the side

compartment assemblies, flanged out to form a drip edge over the compartment doors.

### **RUBRAILS WITH RED REFLECTIVE STRIPE**

Protective rubrails shall be provided along the lower edge of the apparatus body, below the compartment doors. The rubrail assemblies shall be spaced-out and isolated from the body with non-metallic materials. Each rubrail shall consist of an anodized aluminum extrusion interlocked with an extruded UV stable, rubber impact strip. The rubber impact strip shall have a molded recess in which a 1" wide red reflective strip is located.

### **HANDRAILS**

Handrails shall be constructed of 1-1/4" diameter heavy duty polished extruded aluminum tubing with three (3) fully replaceable rubber grip inserts with polished chrome-plated cast mounting brackets.

Two (2) looped handrails shall be installed on the turntable access stairway at the rear driver's side of the apparatus body, one (1) each side.

Two (2) straight handrails shall be installed on the rear curbside of the apparatus for assisting in loading the hose bed.

### **STEPS**

An access step arrangement shall be provided at the rear of the body, each side.

The step assemblies shall feature six (6) open grate aluminum corner steps. The four (4) driver side steps shall access the aerial turntable, while the curb side steps access the low hosebed. The step assembly shall be compliant with the latest NFPA 1901 standards.

A fold-down step shall be built into the body below step arrangement. This step shall serve to provide easier access when the unit is raised upon its outriggers. A latch assembly shall be provided to hold the step in the stowed position. The step assembly shall be wired to the "compartment open" light in the cab to indicate when the step is not stowed.

### **CHROME PLATED FOLD DOWN STEPS**

Six (6) chrome plated fold down steps shall be installed on the front of the main body bulkheads, three (3) each side of the apparatus adjacent to the pump panels. The steps shall provide access to the top of the pump enclosure and hosebed storage areas. Step tread area shall be of equal size or greater than that indicated by the current NFPA Standards.

### **OUTRIGGER COVERS**

Highly polished stainless steel outrigger covers shall be provided. The outrigger covers shall be no wider than 15 inches so as not to prohibit extension of the outrigger between parked cars.

### **OUTRIGGER PAD STORAGE SLIDES**

Two (2) auxiliary outrigger pad storage slide assemblies with locking devices to hold one (1) auxiliary outrigger pad each shall be provided. The storage slides shall be located under the

apparatus, one (1) each side. The slides shall be constructed of U.H.M.W. nylon assemblies with body material mounting angles.

The slide assemblies shall be installed as not to interfere with the angle of departure of the apparatus.

### **HOSE BED**

For ease of unloading and loading the hose, the floor of the hosebed shall not be more than 60" from the ground. Also, the hose payout shall be directly from the right rear of the apparatus without the use of chutes, tunnels or other indirect methods of deploying the hose.

The hose bed storage shall be approximately 24" wide x 128" long x 27" deep (49 cubic feet).

A Duradek #T-1800 extruded Polyester Resin (Gray in color) hosebed floor shall be provided. Flooring "T" channels shall be spaced apart to allow for hose ventilation. Each "T" section of the flooring shall be a minimum of 1" high x 1-1/2" wide.

The hosebed storage area shall have a capacity large enough to hold a minimum of 1000 feet of 5 inch large diameter fire hose.

### **HOSEBED COVER**

A heavy duty black vinyl cover shall be provided for the main hosebed with quarter turn fasteners on the front and down each side of the cover. Velcro fasteners shall be provided down the sides of the flap. The rear flap shall be weighted along the lower seam.

### **GROUND LADDER STORAGE**

Ground ladders shall be stored in the enclosed center ladder storage area within the plate style torque box under the turntable support structure, unless otherwise note. The interior ladders shall store on full length .250" fiberglass slides with access from the rear of the apparatus.

Each ladder shall be labeled to identify the specific ladder stored in that slide.

Removal of one ladder to access another ladder shall not be acceptable.

### **PIKE POLE STORAGE**

Pike pole storage shall be provided in the rear storage area with access through the rear ground ladder access door, unless otherwise noted. Pike poles shall be stored in individual, properly labeled, 2.25" diameter aluminum tubes.

### **REAR TOW DEVICES**

Two (2) rear tow eyes shall be provided, one (1) each side, and shall be connected directly to the chassis frame. The tow eyes shall be painted silver aluminum.

### **12V ELECTRICAL SYSTEM AND COMPONENTS**

The electrical system and its equipment shall comply with all applicable FMVSS requirements, including Federal Motor Carrier Safety Regulations (FMCSR) and shall also conform to all the applicable SAE recommended standards and practices, whether or not specifically referenced in this document while complying with the subparagraphs herein. All electrical and electronic components shall be selected to minimize electrical loads. All electrical system components and wiring shall be readily accessible through access panels for checking and maintenance. All

switches, indicators, and consoles shall be located and installed in a manner that facilitates easy removal and servicing. All exterior housings of lamps, electronic devices, and fixtures shall be corrosion resistant and weatherproofed. The electrical system for this vehicle shall be the most technologically advanced system available for emergency vehicles.

The body power distribution shall be accomplished by using a solid state power control unit. These units shall be solid-state and not employ electromechanical relays, breakers, solenoids or other internal components that wear or reduce the body's electrical service life. These power distribution units shall provide multiple control and management of the electrical power provided by the chassis electrical system and assist in the critical maintenance of vehicle batteries. Power distribution units shall be positioned in the vehicle to minimize the length of wire runs to the devices they control. They shall be installed in the body bulkhead areas and not be exposed to shifting equipment. Easily removal access panels shall be provided for service access.

The electrical control system shall be the Weldon Technologies, Inc. V-MUX Multiplex System. The electrical system shall provide multiple switching and interlocks to turn on outputs from two or three switch locations making control of specific devices more operationally efficient.

The system shall have the capability to shed extraneous electrical loads from any power distribution units output at eight (8) different voltage levels. This feature shall provide micro-management of necessary electrical loads during acute or transitory electrical system failures.

The system shall be designed to survive extreme temperature conditions from -40F to +185F. The system shall be sealed against environmental conditions of moisture, salt and fluids and shall be protected against over voltage and reverse polarity conditions.

Troubleshooting and service shall be accomplished by attaching a PC Diagnostics interface and viewing the messages across the communications node on a laptop computer. Each node shall be capable of being queried for voltage levels and indicate where in the system a voltage drop has occurred. Status of all inputs and outputs shall be determined through the PC interface.

The wiring shall be permanently color coded to identify wire function. Wires shall be permanently heat ink embossed with both number and function codes. The function codes shall be the "descriptive" name of the circuit served. The number code shall be the exact purpose of that circuit. This number code shall be completely referenced in a detailed wiring schematic provided with the vehicle.

Wiring installed in the manufacturing process shall be routed in conduit or high temperature loom with a rating of 300 degrees Fahrenheit where necessary to protect it. All added wiring shall be located in accessible, enclosed, and protected locations. All conduits, looms, and wiring shall be secured to the body cable straps in order to prevent sagging and movement resulting in chafing, pinching, snagging, or any other damage. These cable straps shall be secured to "welded" stud provided as required throughout the harness run to provide security. All apertures on the vehicle shall have grommets and be properly sealed for passing wiring and conform to SAE 1292. 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.

The body wiring shall be provided with "centralized" ground points. These shall be easily accessible for service. These centralized ground points shall utilize solid connection studs for reliability. The wiring harness shall incorporate a master ground wire to connect to these grounding studs. The internal connections for the ground wires where they feed into this master ground wire shall be an ultrasonic connection. Where they connect to the ground stud the connection shall be a machine crimped, epoxy sealed ring terminal.

Wiring connections from the wiring harnesses to various components or electrical assemblies shall be made through the use of either machine crimped, epoxy sealed ring terminals or self-sealing

Deutsch connectors.

### **COMPARTMENT LIGHTS**

Flush mounted lights to illuminate the compartment interior shall be provided with the quantity determined by the height and width of each compartment. At least three (3) lights shall be provided in each enclosed compartment over 36" in height. While at least two (2) lights shall be provided compartments under 36" in height.

The lights shall be controlled by an automatic door open switch, which shall be wired to the compartment open indicator light in the cab. The

Two (2) flush lights of the same style shall be provided in the enclosed ground ladder storage areas, with automatic door switch.

### **STEP LIGHTS - BODY**

A light shall be installed at the rear access to illuminate the step leading to the aerial turntable. These lights shall be activated when the lower step is in use position.

### **SHELVING**

Three-(3) shelves shall be provided. The shelves shall be constructed of 3/16" smooth aluminum plate. The front and rear edges shall be formed up 2". Adjustable shelves shall be mounted on adjustable track type channels to provide height adjustment with simple standard hand tools.

### **TRAYS, 250 POUND CAPACITY**

Two-(2) floor-mounted trays shall be provided. The trays shall be constructed of 3/16" smooth aluminum plate with at least a 3" lip formed around the perimeter and the corners welded. Trays shall be mounted on full extension ball bearing slides with a minimum rating of 250# per pair. The trays shall be capable of being locked in both the extended and retracted positions.

### **NFPA WARNING LIGHT SYSTEM OPERATION**

#### **Emergency Warning System:**

Rocker switches located on the cabs dash activate the emergency warning lights system. The rocker switches shall have an internal indicating light to show when the switch is in the on position. Individual switches shall be installed to allow pre-selection of various components of the warning system. The switches shall be mounted centrally located for easy service and identification. The electrical system components and wiring shall be readily accessible through service panels.

#### **The Optical Warning Device System:**

The Optical Warning Device System shall comply with NFPA 1901 without exception. To minimize the load placed on the electrical system during apparatus start-up for an emergency response, a sequential switching device shall be installed to energize the optical warning devices.

The warning system shall be divided into upper and lower warning levels. The optical warning system on the apparatus shall be capable of two-(2) separate signaling modes during emergency operation. One-(1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency, and is calling for the right-of-way. The other mode shall signal that the apparatus stopped and is blocking the right-of-way

#### **Parking Brake Position Sensing Switch:**

When the master (warning system) switch is closed, and the parking brake released, the warning devices are signaling the call for right-of-way to be activated. When the master (warning system)

switch is closed and the parking brake set, the warning devices signaling blockage of the right-of-way are activated.

Certification of Compliance:

The apparatus manufacturer shall provide a "Certification of Compliance" of the warning system by one of the following means:

1. Certification that the system was installed within the geometric parameters specified by the manufacturer of the system, and referencing the optical source test reports provided by the manufacturer of the system.
2. Certification that the mathematical calculations were performed by a qualified person , demonstrating that the combination of individual devices as installed meet the requirements of the current NFPA standard. This calculation is based on test reports for individual optical sources provided by the manufacturer of the device.
3. Certification of actual measurements of the lighting system were performed after installation on the apparatus.

**AERIAL LADDER CONTOURED COMBINATION LIGHT BAR**

A strobe warning light bar with two-(2) clear lenses and two-(2) red lenses shall be installed and meet NFPA 1901 requirements for zone A. The center three-(3) sections shall be removed to accommodate the aerial ladder section, for a clear width of 46.13".

On each side of the ladder, at the front corners of the cab a right angle clear lens shall contain one-(1) clear halogen rotating beacon and one-(1) red halogen rotating beacon. Two-(2) side facing sections shall each have red lenses and two-(2) clear 600 series linear strobe lights.

Two-(2) amber ICC marker lights shall be installed in the light bar. Three-(3) amber ICC marker lights shall be installed on the forward center section of the cab roof. There shall be red LED indicators at the switch console to indicate the selected lights are illuminated.

Two-(2) red Whelen 600 series halogen, one-(1) on the left-hand side and one-(1) on the right-hand side mounted in the headlight bezel inboard of the headlights.

**BODY WARNING LIGHTS**

Two-(2) Whelen RB6PAP amber lens rotating halogen beacons shall be installed on the upper rear corners of the apparatus body.

Two-(2) Whelen 600 series red lens LED lights shall be installed one-(1) each lower side of the apparatus. Lamps shall be installed with Whelen 6E chrome plated flanges.

Two-(2) Whelen 600 series red lens LED lights shall be installed one-(1) each side on the outrigger covers. Lamps shall be installed with Whelen 6E chrome plated flanges.

Two-(2) Whelen 600 series red lens LED lights shall be installed on the lower rear of the apparatus. Lamps shall be installed in polished aluminum spacer castings.

**ICC LIGHTING-BODY**

Two-(2) Truck-Lite amber LED combination turn/clearance lights shall be mounted on the body side wheel well panel, one-(1) each side. Each light shall be provided with a reflector style lens assembly. These lights shall be wired to the turn signal control circuit, four-way flasher circuit, and the headlight switch circuit in the cab.

Two-(2) Dialight Series 15 red LED clearance lights and two-(2) Arrow red reflectors shall be mounted below the rear of the apparatus, one-(1) each side.

Five-(5) Dialight Series 15 red LED clearance lights and two-(2) Arrow red reflectors shall be mounted below the rear of the apparatus.

The headlight switch shall activate the apparatus clearance lights.

### **HEADLIGHTS**

Two-(2) rectangular halogen headlights, one-(1) each side with high beam and low beam together, shall be installed in each cab front recessed headlight module.

### **TURN SIGNALS**

Two-(2) incandescent lights, each with a amber contoured lens, shall be mounted to the side of the headlamp bezel. These lights shall be visible to side and front approaching vehicles. The housings shall be chromed plastic.

A heavy-duty, non-polarity sensitive electronic flasher shall be provided to control the turn signal and emergency four-way flasher requirements.

### **UNDERBODY LIGHTS**

Eight-(8) clear lens underbody work-lights shall be installed under the cab & body around the perimeter of the vehicle, in compliance with NFPA 1901. The lights shall be strategically placed to illuminate the immediate ground area around the unit. The cab under body lights shall be switch able but automatically activate when the cab doors are opened the remainder of these lights shall be switched in the cab.

### **DECK LIGHTS**

There shall be two-(2) Unity AG-S 6" chrome plated, individually switched at the light, hose bed lights installed on the rear stanchions, one-(1) each side.

### **LICENSE PLATE LIGHT**

One-(1) license plate light and bracket shall be installed on the left side rear of the apparatus with the light to be wired to come on with the headlights.

### **STOP, TURN, AND BACK-UP LIGHTS**

Install three-(3) Whelen 600 series lights in individual polished lamp bezels, one-(1) each side on the lower rear body corners. Each bezel shall be mounted with closed cell neoprene molding around the full perimeter contact surface area of the body to seal out moisture and eliminate electrolysis. The tail lamps shall be installed in the following descending order:

|          |                              |
|----------|------------------------------|
| Outside: | Red LED Stop/Tail Light      |
| Center:  | Amber LED Arrow Turn Signals |
| Inside:  | Clear Halogen Back-Up        |

### **DUAL ELECTRIC HORNS**

Dual electric horns rated at 400hz/500hz shall be installed under the cab, controlled through the horn ring on the center of the steering column, and wired through a dash mounted selector switch

allowing control of either the electric or air horns.

### **SIREN/PA WITH SPEAKERS**

One-(1) 200 Watt, full feature, solid state, electronic siren shall be installed in the cab. The siren includes a hard wired microphone, a remote mounted amplifier and a flush mounted control panel located in the center of the dash for accessibility to both the driver and officer. Two-(2) 100- watt speakers with cast aluminum housings and protective grills shall be recessed in the left and right sides of the bumper and wired to the electronic siren.

### **FOOT SWITCH**

One-(1) foot switch shall be installed on the officer's side of the cab to activate the electric siren.

### **AIR HORNS**

Two-(2) chrome plated Grover Stuttertone 21" air horns shall be mounted through the front bumper, one-(1) each side and plumbed to the chassis air brake system.. A horn/air horn selector switch shall be installed on the central dash panel allowing the choice of either the dual electric horns or the air horns to be activated by the steering wheel horn button.

### **HORN/AIR HORN SELECTOR**

A horn/air horn selector switch shall be installed in cab switch control panel to allow the selection of either the chassis road horns or the air horns to be activated by the steering wheel horn button.

### **BACK-UP ALARM**

A Code 3 model D50C electronic back-up alarm producing 97 db shall be installed on the apparatus and shall automatically activate when the truck is shifted into reverse gear.

### **PAINTING - GENERAL REQUIREMENTS**

The final finishing of the apparatus shall be performed to the highest standards of the fire apparatus industry.

All removable components and accessories shall be fitted to the body and then removed prior to final finishing ensuring paint has been applied under all components and accessories.

Care shall be taken during paint preparation to properly fill all surface imperfections. Welded seam areas shall be ground flush and metal finished. Bare metal surfaces shall be etched chemically to insure proper adhesion. The primer shall be sanded to assure a smooth surface for painting.

The cab and body shall be finished using PPG urethane enamel paint for a high gloss and hard finish.

### **SINGLE COLOR CAB PAINT**

The cab exterior shall be painted using a single color as follows.

Paint Color:                      Traditional Red

### **CHASSIS PAINT**

The chassis frame and all frame mounted components, less the engine and transmission, shall be painted with black high solids polyurethane paint.

### **SINGLE COLOR BODY PAINT**

The exterior of the apparatus body shall be painted using a single color to match the cab primary color.

### **COMPARTMENT INTERIOR FINISH**

The interior walls of all enclosed body side compartments shall be painted white with black webbing. The white compartment interior shall enhance compartment illumination. The black webbing shall make compartment scratches caused by eventual equipment wear less noticeable and easier to touch-up and blend.

### **WHEEL FINISH**

Vehicle wheels shall have the standard factory color.

### **BODY UNDERCOATING**

The body shall be thoroughly prepared and sprayed with a rust inhibiting undercoating. Areas to be sprayed shall include the backsides and undersides of all compartments. All substructure under the body shall be undercoated thoroughly.

### **SCOTCHLITE LETTERING**

There shall be up to sixty-(60) 3" Scotchlite reflective letters applied to the apparatus as directed by the fire department.

### **AERIAL LETTERING**

Both sides of the aerial device shall be lettered as requested by the HCC Fire Department. Also, an HCCS logo will be placed next to the lettering. Designed to be pre-approved by Rufus Summers, or his future replacement.

### **SCOTCHLITE STRIPING**

There shall be a triple Scotchlite reflective stripe installed around the perimeter of the apparatus in compliance with NFPA 1901. The triple stripe shall consist of three individual reflective stripes beginning with a 1" wide stripe at the bottom, a 6" wide center stripe, and a 1" wide upper stripe all spaced 1" apart allowing the apparatus color to show between the stripes.

### **75 FOOT AERIAL LADDER SPECIFICATIONS**

The intent of these specifications is to describe a telescoping aerial ladder of the true ladder type. It shall consist of three (3) steel ladder sections with a pre-piped telescoping waterway, a steel turntable, torque box, and outriggers.

It is also the intent of HCC to secure a fire service proven piece of apparatus which is manufactured in the United States.

It is not the intent of HCC 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.

### **CONSTRUCTION STANDARDS**

The ladder shall be designed such that stresses produced at 2 x DL (Dead Load) + 2 x RL (Rated Load Capacity) shall not exceed material yield strength and a one and on-half to one (1.5:1) stability factor, in compliance with the NFPA Standards for aerial fire apparatus.

The capabilities shall be established in the unsupported configuration and all ladder sections, turntable, torque box and outriggers shall be designed by computer modeling analysis (FEA). The selected contractor shall provide written certification, signed by the third-party Registered Professional Engineer, certifying that the aerial meets the requirements of NFPA 1901.

**HEIGHT**

The minimum height of the aerial device at 78 degrees elevation and full extension shall be 75 feet. This shall be measured by a plumb line from the top rung of the ladder to the ground.

**REACH**

As horizontal reach is often more important than vertical height, the minimum horizontal reach shall be 66 feet. This shall be measured from the centerline of rotation to the tip of the fly section.

**WELDMENT FIXTURE**

To ensure the highest levels of quality and ultimate safety, all weldments including outriggers, turntable, ladder sections, pins and bushings shall be manufactured by the selected contractor to ensure sole source responsibility. All raw materials shall be vendor certified. Each weldment shall be third-party certified prior to assembly.

To ensure tolerances between parts and part interchangeability, all weldments shall be manufactured in fixtures. To further ensure weld integrity in all weldments, the fixtures must be able to rotate to enable the weldment to be welded in the number 1 flat welding position, resulting in maximum weld penetration in the welded material.

**AERIAL CRITERIA AND STANDARDS**

The following aerial ladder and water capabilities shall be established in the unsupported configuration with the truck level, the outriggers fully extended and lowered to relieve the chassis weight from the suspension. The capacities shall be based upon 360 degree continuous rotation and up to full extension. The ratings shall be based on average weight of personnel on ladder at 250 lbs. each.

The following aerial ladder and water capabilities shall be established in the unsupported configuration with the truck level; the outriggers fully extended and lowered to relieve the chassis weight from the axles. The capacities shall be based upon 360 degree continuous rotation and up to full extension and based on average weight of personnel on ladder at 250 lbs. each.

The ladder shall be designed to permit 500 pound tip load, up to full ladder extension from -7 to 78 degree elevation. In addition to the 500 pound personnel allowance, 100 pound allowance shall be included for equipment mounted at the tip of the ladder.

| Elevation        | Tip or Evenly Distributed Load                     |
|------------------|--|
| -7 to 45 degrees | 500 pounds @ tip or 1000 pounds evenly distributed |
| 46 to 78 degrees | 500 pounds @ tip or 2000 pounds evenly distributed |

**WATER TOWER OPERATION CAPABILITIES:**

The ladder and water system shall be designed to permit 1500 GPM flow with water stream parallel

to ladder or 90 degrees to either side of the ladder. The stream elevation shall be from 30 degrees above horizontal to 135 degrees below horizontal.

With the above flow rates, the ladder shall be capable of -7 to 78 degree elevation at full extension with a 500 pound tip load.

|                  |            |
|------------------|------------|
| Elevation        | Tip Load   |
| -7 to 78 Degrees | 500 Pounds |

### **LOAD CRITERIA CERTIFICATION**

The selected contractor shall supply a written statement to HCC from a registered Professional Engineer certifying that the structural safety factor based on rated capabilities have been achieved.

This statement shall be based on the following definitions:

DL = Dead load stress induced by structure and permanently attached components (psi).

RL = Rated capacity load stress induced by vertical payload (500 pound minimum).

WL = Water reaction stress. Stress induced by nozzle reaction and weight of water (1500 GPM at 90 degrees either side of ladder centerline). The nozzle reaction force shall be a minimum of 606 pounds perpendicular to the ladder centerline

Fy = Yield strength of steel (psi).

The ladder shall be certified to the following criteria:

With no water flowing and full rated vertical tip load (500 pound minimum) in worst position (0 degrees elevation with ladder at full extension), for ladder stress:  $2 \times DL$  plus  $2 \times RL$  is less than or equal to Fy

With the ladder at a 45 degree elevation angle at full extension and with water flowing and full rated vertical tip load (250 pound minimum) with monitor in worst position for ladder stress (1500 GPM minimum):  $2 \times DL$  plus  $2 \times RL$  plus WL is less than or equal to Fy

### **AERIAL APPARATUS CERTIFICATION (TYPE I)**

The aerial device shall be tested and certified by Underwriters Laboratories, Inc in compliance with the National Fire Protection Association's Standard No. 1914, latest edition, during construction and before shipment. All welding on the aerial device shall meet American Welding Society (AWS) D1.1 Structural Welding Code.

The following tests shall be conducted by personnel holding a Level II certification in accordance with ASNT-TC-1A recommended practices:

1. Nondestructive testing methods shall be incorporated into the inspection to detect defects and improperly secured parts.

Magnetic particle inspection shall be conducted on all parts of the ladder, turntable torque box, and outriggers before assembly to assure the integrity of the weldments and to detect any discontinuities. Manufacturers that test after assembly of the complete ladder device shall not be acceptable.

Ultrasonic inspection shall be used to detect any flaws in pins, bolts, and other critical mounting components.

2. Functional tests, load tests, stability tests, and visual structural examinations shall be performed. These tests shall determine any unusual deflection, noise, vibration, or instability characteristic of the unit.

Upon completion of the preceding inspections, Underwriters Laboratories, Inc shall issue a Certificate of Inspection, Type I indicating that all specified standards have been satisfied. Aerial manufacturers not utilizing third-party, independent testing companies shall not be acceptable. Aerial manufacturers not providing a Type I Certificate of Inspection shall not be acceptable.

### **APPARATUS LEVELING OPERATION**

The apparatus shall be capable of being operated at full rated capacities up to 10.5 degree slope (18% grade). On slope conditions from 10.6 to 15 degree (25% grade), the apparatus capability shall be reduced to 50% of full capacities.

### **TESTING CRITERIA**

The following stability requirements shall be met by the aerial apparatus when in a service-ready condition. Items such as water, hose, ground ladders and loose equipment shall removed. Items mounted on the aerial device by the manufacturer shall remain mounted.

1-1/2:1 Stability Test - A test of the apparatus shall be performed to confirm that the ladder sections are so designed and powered to support a load representing 150% of the manufacturer's rated payload capability at maximum horizontal reach and rotated a complete 360 degrees. Specifically, a 750 pound tip load with the ladder fully extended, at a range from -7 degrees to +78 degrees, shall be rotated 360 degrees. The ladder may need to be raised slightly in order to clear apparatus body and cab.

1-1/3:1 Stability Test - A test of the apparatus shall be performed to confirm that the ladder sections are so designed and powered to support a load representing 133% of the manufacturer's rated payload capability at maximum horizontal reach and rotated a complete 360 degrees with the vehicle on a slope of 5 degrees downward in a direction most likely to cause overturning. Specifically, a 666 pound tip load with the ladder fully extended, at a range from -7 degrees to +78 degrees, shall be rotated 360 degrees. The ladder may need to be raised slightly in order to clear apparatus body and cab.

Ladder Time Test - A test of the apparatus shall be performed to raise the ladder from the bedded position to it's maximum elevation and extension and rotated 90 degrees smoothly and without undue vibration in not over 120 seconds.

Outrigger Time Test - The stabilizers shall deploy from the stowed position to the operating position in not more than 90 seconds.

Water Tower Test #1 - A test of the apparatus shall be performed to test its ability to discharge 1,500 gallons per minute, parallel to the ladder, with the ladder at full extension, and a 250 pound tip load, through 360 degrees of rotation.

Water Tower Test #2 - A test of the apparatus shall be performed to test the ability to discharge 1,500 gallons per minute, 90 degrees to the ladder, with the ladder at full extension, and a 250 pound tip load, through 360 degrees of rotation.

### **AERIAL DEVICE MOUNTING**

The aerial device shall be rear-mounted on the truck chassis with aerial ladder facing forward over the chassis cab. This mounting arrangement is to improve vehicle turning radius, to permit driver visibility of the overhang and to keep the overall length of the vehicle at a minimum.

A steel ladder rest shall be provided to support the ladder in the travel position. The ladder rest shall be bolted to the chassis frame as close to the front axle as design allows. Stainless steel bedding plates shall be attached to the ladder base section to protect the ladder paint when the unit is in the travel position.

### **TORQUE BOX**

The torque box shall be constructed with high strength steel plates. The plates shall be welded together, forming a box style torque box. The ground ladders shall be enclosed within this structure. An open-base steel tubing structure shall provide support for the turntable bearing plate.

The tube style torque box shall transfer all aerial loads into the outriggers, thus preventing damage to the chassis frame and body. The torque box shall be fastened to the chassis frame side rails with huck-spin collar fastener. Units of this type that utilize frame/torque box style chassis shall not be acceptable due to the inability of the replacement of the chassis in the event of vehicle damage to the chassis.

The two (2) outriggers shall be mounted independently under the chassis frame, directly behind the rear axle. The outriggers shall be bolted the chassis frame and torque box using huck-spin collar fasteners.

### **OUTRIGGERS**

Two (2) independently controlled out-and-down type outriggers shall be provided, capable of maximum stability with in a 16' stance across the outriggers.

Each jack cylinder shall have a 5" internal diameter (bore), 3-1/2" external diameter chrome plated cylinder rod with a 25 1/4" stroke. Jack cylinders shall be equipped with dual, integral counterbalance holding valves which shall maintain cylinder position in the event of hydraulic system failure.

To protect the rod at all times from the possibility of nicking or scarring, the jack cylinder shall be mounted with the rod end attached to the top of the outer jack tube. Designs that do not allow the barrel to be extended while keeping the rod fully enclosed shall not be acceptable.

To minimize side loading and subsequent seal failure of the vertical jack cylinder, a 4" wide load bearing nylatron wear band shall encircle the jack cylinder barrel, providing load distribution over a 360 degree plane. Designs which could allow load concentration on one side of the vertical jack cylinder 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 removal of the jack tubes or horizontal beams or dropping the cylinder out the bottom shall not be acceptable.

The extension of the forward horizontal beams shall be accomplished by an extension cylinder which has a 3" internal diameter (bore), 2" diameter cylinder rod, and a 42" stroke.

All cylinders shall be fully enclosed within telescoping jack boxes to protect the cylinder rods against damage which may occur while on the fire ground.

### **OUTRIGGER PADS**

Two (2) one-position floating type 1/2" thick, 154 sq. inch steel pads shall be provided, one (1) on each outrigger.

The outrigger pads shall not require operator adjustment during set-up. Outrigger pads that pivot in only one plane shall not be acceptable due to their inability to distribute loading over the total pad surface on uneven terrain.

### **AUXILIARY OUTRIGGER PADS**

Two (2) auxiliary outrigger pads shall be provided for additional load distribution on soft surfaces. Each pad shall be fabricated of 3/8" 6061-T6 high strength aluminum alloy plate and shall have a handle for easy use of the 24" x 24" flat pad.

### **OUTRIGGER LEVELING INDICATORS**

Two (2) bubble type leveling indicators shall be provided at the outrigger control station, one (1) each side, to assist in outrigger set-up and leveling of the apparatus.

### **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, separate and distinctive from that of other audible warning systems provided on the apparatus. When the outrigger control device is released to its neutral position, the signal shall cease. The warning device shall have a two-position switch to enable the dB level to be raised or lowered.

### **LADDER/OUTRIGGER INTERLOCK SYSTEM**

A ladder/outrigger interlock system shall be provided to prevent the lifting of the aerial from the nested position, until the operator places all jacks in the load supporting configuration. A limit switch at the ladder rest shall prevent operation of the outriggers once the aerial has been elevated from the nested position. The interlock system shall be provided with manual override. For the safety of personnel and equipment, no exceptions shall be allowed to this interlock system.

### **SAFETY FEATURES**

The outrigger system shall provide the following safety features:

1. An outrigger interlock system to prevent raising of the aerial prior to all outriggers' being in firm contact with the ground. Green indicator lights shall be provided at the outrigger control stations to indicate circuit completion.
2. A ladder cradle/outrigger interlock system shall be provided to prevent the lifting of the aerial from the nested position until the operator places all jacks in the load supporting configuration. A limit switch at the ladder rest shall prevent operation of the outriggers once the aerial has been elevated from the nested position.

For the safety of personnel and equipment, no exceptions shall be allowed to this interlock system.

### **AERIAL LADDER SECTION CONSTRUCTION**

The aerial ladder shall be comprised of three (3) sections. The ladder sections shall be constructed of welded, high-strength steel throughout. Each section shall be trussed diagonally, vertically, and horizontally, using steel rectangular tubing, reinforced at critical points for extra rigidity, thus giving a high strength-to-weight ratio. Aluminum ladder sections, either welded or riveted, shall not be acceptable due to aluminum's loss of strength when exposed to high temperatures incidental to fire fighting.

All ladder rungs shall be welded to the rung rail section in two (2) places. K-bracing shall be provided between the rungs and ladder rung rails to provide the ability to discharge water at 90 degrees to the side of the ladder. Ladders that do not utilize K-bracing shall not be acceptable.

All rungs shall be round and covered with deeply serrated, replaceable, heavy-duty rubber sheaths, which shall be both glued and clamped securely to the rungs. Due to high maintenance cost and difficulty in replacement of antislip rung surface and the inability to provide a safe surface during icing conditions, ladder designs that do not utilize rubber rung covers shall not be acceptable.

Ladder construction shall complement the support of heavy or unbalanced loads at horizontal or low-angle positions.

To allow the passing of personnel on the ladder and safe ladder climbing at any angle, the dimensions of the ladder sections shall be as follows:

| Ladder Section | Width  | Height |
|----------------|--------|--------|
| Base           | 35.75" | 22.63" |
| Mid            | 30.50" | 20.19" |
| Fly            | 26.00" | 18.00" |

### **DOUBLE WALL RAIL CONSTRUCTION**

The bottom rung rails of the base and middle ladder sections shall be of double-wall construction. Flat stock shall be welded to the top of the tubular rung rails to increase their thickness, thus preventing damage and fatigue to the rung rails caused by road hammer while being driven and heavy loads during ladder operation. The flat stock shall act as the load transfer surface between telescoping sections, thus providing greater load transfer from section to section.

### **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 a radius handrail. The bolt-on section shall be easily replaced if damaged during fire fighting operations.

### **FOLDING STEPS**

Two (2) spring-loaded aluminum folding steps with "Bustin" non-slip aluminum inserts shall be installed in the fly section of the ladder to provide footing for an operator stationed at the tip of the fly section. Springs shall hold the steps in place during use and secure the steps in the stowed position when not in use. Each step shall have a minimum surface area of 72 square inches and a minimum design load of 500 lbs.

### **BASE SECTION NAMEPLATES**

Two (2) painted white aluminum nameplates shall be provided and bolted on the ladder base section for the Fire Department's name, one (1) each side. The nameplates shall be 14" high x 120" long.

### **ELEVATION SYSTEM**

Two (2) double-acting lift cylinders shall provide smooth, precise elevation from minus 7 degrees to plus 78 degrees. Units that do not operator below 0 degrees shall not be acceptable.

The elevation cylinders shall have a 5.50" internal diameter (bore); 3.00" cylinder rod diameter;

and a 36-1/8" stroke. The cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should the charge lines be severed at any point within the hydraulic system. Units that do not use holding valves on the cylinders shall not be acceptable. A hydraulic holding valve shall be provided in the elevation circuit to retain the aerial ladder in its bed when the vehicle is in motion.

The elevation cylinders shall be provided with both rod and piston "hydraulic cushions". The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke.

### **ROTATION SYSTEM**

A 40.29" diameter external tooth monorace bearing shall be provided for 360 degree continuous rotation in either direction. The bearing shall have a minimum rated moment of 523,000 ft. lbs. To ensure proper bearing installation and long service life, surfaces of both the open base bearing plate and the turntable bearing plate shall be milled. Units that do not have milled bearing surfaces shall not be acceptable.

The bearing shall be bolted to the turntable and bolted to the open base support plate, using seventy-one (71) 7/8" diameter Grade 8 bolts. A planetary drive gear box, powered by a hydraulic motor, shall provide precision rotation control throughout 360 degrees of rotation. A spring-applied, hydraulically-released disc type brake shall be furnished to provide positive braking of the turntable assembly against reactionary forces such as water flow and gravity.

The turntable rotation bearing shall be easily accessible for lubrication and retorquing of bolts from the turntable side, for ease of access.

Access to the turntable bearing bolts which requires the removal of the ground ladders and/or the ground ladder slide assemblies, during bolt retorquing process shall not be acceptable.

### **ROTATION LIMITING SYSTEM**

An aerial ladder rotation limiting system shall be provided to notify and prevent the operator from rotating the aerial ladder into a restricted position due to a "short-set" outrigger configuration. The system shall enable the operator to place the aerial ladder in a 180 degree rotation to the opposite side of the apparatus than that of the "short-set" outriggers only. Indicator lights shall be provided on the turntable control console to indicate outrigger not deployed status.

In order to rotate the aerial ladder with a outrigger "short-set", the aerial interlock override control momentary switch located in the turntable control console shall require to be continuously activated while rotation of the aerial is in process. The system shall be capable of rotating the ladder slightly past the centerline of the apparatus on the "short-set" side to enable bedding of the ladder within the travel support structure without system cutout.

### **EXTENSION/RETRACTION SYSTEM**

A full hydraulic powered extension and retraction system of the ladder shall be provided through dual hydraulic cylinders and cables, each capable of operating the ladder in the event of failure of one of the systems.

The extension cylinders shall have a 3.00" internal diameter (bore) with 1.75" diameter rod. The extension/retraction cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should the charge lines be severed at any point within the hydraulic system.

The extension cylinders shall be provided with both rod and piston "hydraulic cushions". The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke.

Cylinders in excess of 25 feet with the rod extended, or that require the attachment of the rod to the mid section, shall not be desirable for two (2) reasons that are not consistent with the level of quality desired by the purchaser:

1. Rod attachment to the mid section requires that the lower rung rail cannot be sealed from the atmosphere and therefore long-term corrosion cannot be adequately controlled.
2. The cylinder shall be subjected to the buckling forces caused by normal ladder deflection.

Cables attached to the base and mid ladder sections shall be routed over sheave wheels on the base section and cylinder sheave mount. This cabling arrangement shall act as a stroke multiplier to provide full-power ladder extension and retraction.

Dual extension/retraction cables shall have a minimum safety factor of 5:1 and shall be of the following diameters: Mid Section: 1/2" / Fly Section: 5/16".

### **LADDER SLIDE MECHANISM**

All ladder slide pads shall consist of ultra high molecular weight (UHMW) synthetic material with a sliding coefficient of friction of 0.05. Slide pads shall be used on both upper and lower bearing surfaces and to control side sway of the sections.

### **AIR/ELECTRIC LADDER TRACK**

All air and electric line routing shall be accomplished using a flexible conduit system. Routing shall be such that cables shall be fully enclosed except at points of transition between sections. The conduit shall run through the handrail uprights, so the conduit does not decrease the interior width of the ladder..

### **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.

### **HYDRAULIC SYSTEM**

The hydraulic system shall provide power in as efficient a manner as possible. The system shall use a piston type load sensing pump and shall be capable of operating under any rated load condition and aerial position at normal engine idle (slow idle) or governor controlled fast idle. The piston pump shall be capable of generating sufficient flows to allow multiple function operation without significant loss of speed.

For size and weight considerations, a 40 gallon (maximum) oil reservoir is desired. The reservoir shall be equipped with a gated drain line and a gated suction line shall be provided between the oil reservoir and the hydraulic pump. The reservoir shall have a magnetic rod, a drain plug, an oil level sight glass and an easily accessible fill cap.

The system shall be equipped with both a pressure and a return line filter of no greater than 10 micron in mesh size. Filters shall be equipped with easily visible dirt alarms. Both filters shall be protected by bypass circuits to protect the system from extreme contamination caused by the breakdown of a neglected filter and subsequent release of previously trapped particles into the system.

The hydraulic system cylinders shall be sized and rated in accordance with previously described structural safety factors.

All hydraulic hoses and steel lines used in the system shall have 4:1 safety factor based upon burst pressure. Hoses shall be of the steel braided, rubber covered type and shall be properly sized to reduce heat build-up during prolonged periods of operation.

The system shall not be dependent upon an auxiliary cooler to control system temperature. The system shall be capable of generating full rated flow capacities at no more than 1500 rpm. Each function shall be protected by a system relief valve and/or individual circuit relief valves, preset at the factory. Maximum preset system pressure shall be 3000 psi.

A three-function hydraulic proportional valve bank shall control ladder functions. The valve shall be located at the turntable with direct linkage controls. Three (3) aerial control actuators shall be located at the aerial control station to provide "Raise/Lower"; "Extension/Retraction" and "Swing Left/Right" functions.

The hydraulic system shall be capable of simultaneous outrigger functions or simultaneous aerial functions.

#### **COMBINATION HYDRAULIC, WATER AND ELECTRIC SWIVEL**

Hydraulic power to the turntable hydraulic circuits shall be provided through a three-port, high pressure hydraulic swivel permitting 360 degrees continuous rotation of the turntable.

Water shall be transferred to the aerial waterway by means of a 4" internal diameter water swivel, permitting 360 degree continuous rotation.

Electric power to the turntable electric circuits shall be comprised of a minimum of twenty six (26) ring collector assembly, permitting 360 degree continuous rotation of the turntable.

#### **12 VOLT EMERGENCY HYDRAULIC SYSTEM**

The apparatus shall be equipped with a 12 volt emergency hydraulic power system. The emergency system shall be electrically driven from the truck batteries and shall be capable of limited ladder functions to stow the ladder and outriggers in case of primary hydraulic pump failure.

Two (2) spring loaded switches shall be provided, one (1) on each side outrigger control station, to activate the emergency power unit.

#### **POWER TAKE-OFF (PTO)**

The apparatus shall be equipped with a "Hot-Shift" PTO driven by the chassis drive train. A red indicator light shall be located in the cab next to the PTO switch to show when the PTO is engaged.

The PTO shall only engage with the chassis spring brake set and the transmission in neutral (or drive if the fire pump is engaged) to prevent unintentional movement of the chassis during hydraulic system operation.

For the safety of personnel and equipment, no exceptions shall be allowed to this neutral safety system.

#### **TURNTABLE DECK**

A steel tube support structure shall be welded to the turntable bearing plate.

A 68" x 75" aluminum treadplate deck shall be attached to the support structure, covering the top surface of the structure. An aluminum treadplate step access shall be provided at the heel of the aerial ladder.

#### **SAFETY RAILING - TURNTABLE**

Forty-two inch (42") high safety railing shall be provided at the sides and rear of the turntable. The safety railing shall be constructed of 1-1/4" diameter heavy duty stainless steel knurled tubing. Brackets shall be polished stainless steel type. A vinyl covered safety chain shall be provided across each corner opening with chrome plated snap style clips.

#### **CRADLE ALIGNMENT INDICATORS**

Aluminum arrows with red Scotch-Lite coating shall be provided on the turntable surface, and on the apparatus body to indicate the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be suitably illuminated for night time operation.

#### **AERIAL CONTROL STATION - TURNTABLE CONSOLE**

An aerial control console shall be located on the street side of the turntable with the ladder in the nested position, such that the operator can easily observe the tip of the aerial device while operating the controls. The operator shall have at least 5 square feet of standing and working and working space exclusive of any other space required.

The pedestal shall be constructed from an aluminum framework with aluminum treadplate inserts. The treadplate panels shall be provide either hinged doors or removable access panels to the console interior. A hinged aluminum cover shall be provided over the console to protect the etched panel and controls. The top of the console shall be angled to face the operator for ease of ladder operation. The pedestal framework and hinged cover shall be powder-coated for long service life.

The following features shall be provided, clearly identified and suitably illuminated for ease of operation.

**Deadman Foot Switch:** A switch to safeguard against accidental movement of the aerial ladder. The aerial ladder function controllers shall remain inactive while the foot switch is not depressed.

**Ladder Function Controllers:** Three (3) function controllers located on the control panel to provide elevation, extension, and rotation operational control of the aerial device. 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.

**Fast Idle Switch:** A toggle switch located on the control panel to activate the Engine Fast Idle.

**Load chart:** The manufacturer's load chart indicating recommended safe aerial loading, installed within view from the operator's console and properly illuminated for easy reference by the operator.

**Elevation Angle Indicator:** A bubble-type indicator mounted in clear view of the operator to indicate the aerial device's angle of elevation.

**Rung Alignment Indicator:** A light located on the control panel to indicate that aerial ladder rungs are properly aligned for safe climbing.

**Outrigger "Not Deployed" Warning Light:** A red indicator light shall be provided on the turntable

console that illuminates while the outriggers are not in a load supporting position. This light shall turn off once the outriggers are properly locked in position.

Hydraulic Oil Pressure Gauge: A 5000 psi hydraulic oil pressure gauge shall be installed to indicate the overall pressure of the hydraulic system.

### **OUTRIGGER CONTROLS**

Two (2) illuminated outrigger control stations shall be provided at the rear of the body, one (1) each side.

For safety, ease of deployment and operational speed, the outrigger controls shall be of the hydraulic proportional type with manual overrides immediately accessible. The operator shall deploy each outrigger from its corresponding side of the apparatus. And to ensure safe deployment at all times, the controls shall not be obstructed in anyway, which would limit operator visibility of the outrigger in operation.

Each outrigger shall be independently controlled in both in/out and up/down modes to allow vehicle set-up in restricted areas or on uneven terrain.

The following features shall be provided at each control station, clearly identified and suitably illuminated for ease of operation: Fast Idle Switch (Each Side), Outrigger Control Handles, "Outrigger Deployed" Indicators and Emergency Power Unit Switch (EPU).

### **AERIAL ELECTRICAL SYSTEM**

Electrical power for the aerial device shall be drawn from the chassis electrical system and routed through major segregated circuits and into an electric collector ring assembly. The circuits shall provide power for the aerial device controls, indicators, and interlocks; other circuits shall power auxiliary equipment such as lights, intercom, etc.

The electric collector ring assembly shall provide power for electrical ground, ladder control functions, 12 and 120 volt systems. The collector rings shall be enclosed in a sealed, weatherproof housing to prevent corrosion.

All aerial device wiring shall be multi-conductor, copper 16 gauge (minimum), color-coded, with thermosetting cross-linked polyethylene insulation. All aerial device wiring shall be in pre-engineered harnesses with each circuit identified by number and color code. Harness connections shall be through locking, weatherproof, guided pin connectors.

### **ENGINE, FAST IDLE ACTUATOR**

A fast idle actuator system shall be provided to raise the engine RPM to a pre-set level for proper aerial operation. For the safety of personnel and equipment, the fast idle system shall not activate unless the interlock systems have been applied, the chassis spring brakes are set and the transmission is in neutral or in drive, when the fire pump is engaged. No exceptions shall be acceptable to this system.

The aerial device shall not be dependent upon the fast idle circuit to perform any rated task.

### **AERIAL HOUR METER**

An hour meter shall be installed and wired to the aerial PTO to record hours of hydraulic pump operation. The hour meter shall aid in scheduling preventative maintenance as outlined in the Operator's Manual.

### **TURNTABLE WORK LIGHTS**

Four (4) 12 volt work lights shall be installed on the rear step of the turntable to illuminate the turntable treadplate area.

### **OUTRIGGER LIGHTS**

Two (2) 7" diameter, double-faced, red, flashing lights shall be mounted on the inner vertical surface of the outer jack box structure below the horizontal beam.

A 4" diameter, white, ground illumination light shall be located beneath each extending outrigger beam box to illuminate the ground area for night operation.

All outrigger lights shall be activated by the "Ladder Power" switch in the cab to eliminate the need to activate additional switches before starting aerial operations.

### **COMMUNICATION SYSTEM**

An Atkinson two-way communication system shall be furnished between the tip of the fly section and the turntable control station. The communication control box, which includes "Talk" and "Listen" volume controls and a "Push to Talk" button, shall be located at the turntable control console. A "hands-off" speaker which requires no operator attention shall be located at the tip of the fly section.

### **AERIAL SPOTLIGHTS - REAR LADDER BASE HANDRAIL**

Two (2) Unity AG6 spotlights shall be mounted at the rear of the base ladder section, one (1) on each handrail. The spotlights shall be capable of swiveling a 180 degree arc to direct light up the inside or outside of the ladder walkway. The lights shall be 12 volt, 6" diameter, with 50 watt halogen bulbs and "On/Off" switches on each light. The lights shall be mounted below handrail height, so as not to increase overall height of the vehicle.

### **AERIAL SPOTLIGHTS - LADDER TIP**

Two (2) Unity AG6 spotlights shall be mounted at the tip of the fly ladder section, one (1) on each handrail. The spotlights shall be capable of swiveling a 180 degree arc to direct light up the inside or outside of the ladder walkway. The lights shall be 12 volt, 6" diameter, with 50 watt halogen bulbs and "On/Off" switches on each light. The lights shall be mounted below handrail height, so as not to increase overall height of the vehicle.

### **RUNG ILLUMINATION LIGHTS**

The aerial ladder shall be furnished with permanently installed ladder illumination. The lights shall face inwards on each side of the ladder. The lights shall be positioned in such a way that the light shall give the maximum safety for personnel during night climbing. Under no circumstances shall the lights be mounted so that they become an obstruction.

The lights shall be red LED strip style for maximum night time illumination. Due to large reduction of night time illumination, no other color LED lights shall be acceptable.

The lights shall be controlled by a switch on the turntable control console.

### **WATERWAY INLET**

The aerial waterway shall be capable of being supplied by an external water source with intake located on the curbside of the apparatus to the rear of the outrigger.

Four inch (4") Schedule 40 Aluminum waterway piping shall be provided from the inlet to the water swivel beneath the turntable.

A liquid filled water pressure gauge shall be located near the external inlet.

One (1) 1-1/2" drain valve shall be provided beneath the turntable with control located below the external inlet on the rear left side of the apparatus body.

A 4" NPT-F x 4" NST-M chrome plated adapter with screen shall be provided on the waterway exterior inlet.

A 4" NST-F x 5" Storz 30 degree elbow adapter shall be installed on the NST adapter.

A 5" Storz blind cap shall be provide on the inlet adapter.

### **ROTATION SWIVEL**

Water shall be transferred to the aerial waterway by means of a 4" dia. water swivel which is part of the combination hydraulic, water, electric swivel.

### **HEEL PIN SWIVEL**

A swivel elbow located at the heel pins of the ladder shall permit water tower operation throughout the aerial device's full range of elevation.

### **WATER SYSTEM FRICTION LOSS**

The aerial ladder and its waterway system shall be capable of flowing 1000 GPM at 100 psi nozzle pressure at full elevation and extension. The friction loss (total system loss less head loss) shall not exceed 100 psi at 1000 GPM flow with the ladder at full horizontal extension. The pressure reading for friction loss measurement shall be taken at the base of the monitor and at a point below the waterway swivel.

### **TELESCOPIC WATERWAY**

A single anodized aluminum telescopic waterway shall be provided, mounted beneath the center of the aerial ladder. The telescopic waterway shall consist of a 4-1/2" base section tube, 4" mid section tube, and 3-1/2" fly section tube.

### **REMOTE CONTROLLED MONITOR**

An electrically controlled Akron Master Stream Model #3578-RC monitor shall be located at the tip of the fly section. The electrical line to the nozzle shall be equipped with a disconnect plug to permit quick change over to straight bore tips.

Elevation shall be from parallel to the ladder to 135 degrees below parallel. Horizontal sweep shall be 180 degrees (90 degrees to either side of monitor centerline). Stream pattern shall be from straight to fog. The entire water system shall be capable of delivering up to 1,500 gallons per minute at any angle of elevation, up to full extension at 90 degrees to the centerline of the ladder.

### **ELECTRIC NOZZLE**

An Akron "Akromatic" 2000 #5178 3.5" electrically controlled nozzle shall be installed on the electrically controlled deck gun specified. The nozzle shall have a low pressure (80 PSI) automatic flow mechanism to maintain constant pressure through the flow range.

## **MONITOR FUNCTION SWITCHES**

Wireless controlled function switches shall be provided on the turntable control console and the monitor to remotely control the electronic monitor specified.

## **RETRACTABLE MONITOR**

The waterway and monitor shall have a retractable feature to allow it to become disconnected from the tip of the fly section and reconnected to the next lower ladder section of the aerial ladder. This shall eliminate any interference caused by the water pipe and monitor during rescue operations. The aerial ladder shall be capable of full extension and operation when the waterway is connected to either section of the ladder.

The remote control monitor shall be capable of being operated from either section. The electrical circuit for the monitor shall be automatically connected to the section which it is pinned on. Systems which only allow the operation of the monitor from one position, or require a plug to be switched between the sections shall not be acceptable. Due to ice build-up or obstructions, a cable reel shall not be provided for transferring power between the sections.

The waterway and monitor shall have a positive lever type latching system to secure them either to the tip of the fly section or next lower section of the aerial ladder. A latching system requiring a pin to be removed from one location and repositioned into another location shall not be acceptable due to the possibility of dropping the latching pin.

## **FLOWMETER (TURNTABLE)**

An Akron flowmeter shall be installed on the turntable control console to provide a visual display of the ladder water system. The display head shall display both GPM and PSI.

## **MOUNTING FOR ROOF LADDER IN FLY SECTION**

A special width roof ladder mounting brackets shall be provided on the inside of the right side handrail of the ladder fly section.

## **SPECIAL TOOLS**

The following special tools shall be provided for retorquing of specified bolts as recommended by the manufacturer of the aerial device: Extensions, adapters, and sockets (as required), hydraulic oil test kit, custom hydraulic test/air bleeder kit, two (2) tubes of specified aerial lube, one (1) high pressure filter element and one (1) return filter element.

## **PAINTING - AERIAL DEVICE**

Before any painting, all weldments such as the outrigger beams, torque box, turntable, and ladder sections shall be shotpeened to work-harden and stress relieve the exterior surface of all weldments and to ensure removal of any surface imperfections to ensure 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. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the outrigger beams, torque box, turntable and ladder sections shall be thoroughly cleaned, conforming to good painting practices. The weldments shall then be primed with Epoxy Primer.

The aerial ladder sections shall then be coated with a polyurethane primer sealer. After which, they shall be sprayed with two (2) coats of PPG Polyurethane fleet white paint.

The torque box and outrigger beams shall be painted with enamel paint, allowing easy touch-up after extended use. The torque box shall be sprayed black enamel and the outrigger beams silver enamel.

### **SCOTCH-LITE OUTRIGGER BEAM STRIPING**

Each outrigger beam assembly shall be striped with Scotch-Lite reflective material. The stripes shall be applied to provide a safe appearance when the beams are extended. The color of the stripes shall be white, and the width of each stripe shall be two inches (2").

### **OPERATOR INSTRUCTIONS, CAUTION, AND WARNING SIGNS**

The selected contractor shall supply and affix various operator instruction, caution, and warning signs to the front, sides, rear and inside of the apparatus. The warning signs shall meet the general guidelines of ANSI Z35.1 (Specification for Accident Prevent Signs).

### **ON-SITE PREVENTATIVE MAINTENANCE & OPERATIONAL TRAINING PROGRAM**

The selected contractor shall provide an on-site program for training of Fire Department personnel. 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 by HCC, the selected contractor shall supply a factory trained, qualified Field Service Technician for three (3) days of training services.

The training program shall be designed to instruct the HCC personnel who has never utilized an aerial device of this type before. The HCC personnel will be thoroughly taught the operating systems of the aerial device, including emergency operation. Introductory service skills utilizing the vehicle shall also be taught.

### **TRAINING PROGRAM REQUIREMENTS**

The selected contractor shall instruct HCC Fire Department personnel in the operation, preventative maintenance and care of the aerial device, this training program shall be oriented towards a hands-on approach utilizing the new apparatus.

1. Review personnel training level and determine specific training requirements.
2. Explain operations of the entire aerial device. Each participant shall actually use the aerial and be taught the necessary steps for safe operation.
3. Troubleshooting will be emphasized and reinforced continually throughout the training period.
4. Preventative maintenance procedures shall be set up and definite schedules developed to assure proper maintenance of the aerial device.
5. Instruction in the use of tools and how to replace minor assemblies, as applicable. Equally important in this training will be when to call appropriate personnel for assistance.
6. How to order parts through the local service center by utilizing parts manual.

### **SERVICE**

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of down time, the manufacturer of the aerial device shall maintain a network of service centers with factory-trained personnel. The manufacturer of the aerial device shall also have a separate facility for service of units so as not to conflict with production operations. The manufacturer of the aerial device shall also have factory personnel on 24-hour call for emergencies.

### **MANUALS - AERIAL DEVICE**

The following manuals pertaining to the aerial device shall provided at time of apparatus delivery.

A) Two (2) sets of Operator's Manuals which shall include the following sections: Operating instructions, troubleshooting guide, bolt re-torquing criteria, maintenance instructions, vendor service manuals, and hourly maintenance check lists.

B) Two (2) sets of Parts Manuals which shall include exploded view drawings with individual parts identified by part number and common descriptions.

C) Two (2) sets of wiring diagrams for the aerial device shall be provided with the completed apparatus.

D) Two (2) sets of hydraulic diagrams for the aerial device shall be provided with the completed apparatus.

### **DELIVERY REQUIREMENTS**

The apparatus shall be delivered to the following location:

555 Community College Drive, Houston, TX

### **ELECTRICAL SCHEMATICS**

Electrical Schematics shall be supplied for the apparatus in compliance with section 4.19.2.3 of the current edition of NFPA 1901.

### **ENGINE and TRANSMISSION MANUALS**

There shall be an Engine and a Transmission Manual supplied with the apparatus in compliance with section 4.19.2.2 of the current edition of NFPA 1901.

### **OPERATORS and MAINTENANCE MANUALS**

Each apparatus shall include operation and service documents compliant with section 4.19.2.1 of the current edition of NFPA 1901.

### **LADDERS**

One-(1) Alco-Lite PRL-12, 12' aluminum roof ladder shall be provided.

One-(1) Alco-Lite PRL-16, 16' aluminum roof ladder shall be provided.

One-(1) Alco-Lite PEL-24, 24' 2-section aluminum extension ladder shall be provided.

One-(1) Alco-Lite PEL3-35, 35' 3-section aluminum extension ladder shall be provided.

One-(1) Alco-Lite FL-10, 10' aluminum folding ladder shall be provided.

**EQUIPMENT**

Two-(2) Duo-Safety 6FP, 6' fiberglass handle pike poles shall be provided with the apparatus .

Two-(2) Duo-Safety 8FP, 8' fiberglass handle pike poles shall be provided with the apparatus.

Two-(2) Duo-Safety 12FP, 12' fiberglass handle pike poles shall be provided with the apparatus.

Two-(2) Ziamatic #SAC-44 folding wheel chocks with underbody mounting brackets shall be installed under the compartment forward of the left rear wheels.

There shall be a generous size bag of assorted miscellaneous stainless steel fasteners, like these used in the construction of the apparatus, shall be shipped with the completed vehicle for use as spares.

**WARRANTY, CHASSIS/CAB, (1) YEAR, UNLIMITED**

Coverage shall include all factory-installed components of the vehicle/chassis that are not excluded elsewhere in the warranty or by special agreement or described as having a different time, distance, or hours.

**WARRANTY, CHASSIS BRIGHTWORK, (6) MONTH, UNLIMITED**

Warranty coverage shall include all factory-installed components with chrome, polished aluminum, or polished stainless steel surfaces.

**WARRANTY, TOWING/ROADSIDE ASSIST, EXTENDED (1) YR, UNLIMITED**

Coverage shall include US \$ 450 per occurrence if a warrantable defect prevents the safe and lawful operation of the vehicle.

**WARRANTY, DRIVETRAIN (3) YR, UNLIMITED HOURS**

Coverage shall include transmission, steer axle(s), and drive axle(s).

**WARRANTY, BATTERY (1) YEAR**

Warranty coverage includes the battery assembly only.

**WARRANTY, CLIMATE CONTROL SYSTEM, (1) YR, UNLIMITED**

Coverage shall include all parts in the heater and air conditioning system, including electrical components and lines. Excluded are maintenance charging and coolant lost because of loose fittings.

**WARRANTY, STARTER/ALTERNATOR, (1) YR, UNLIMITED**

Coverage shall include: starter motor, starter solenoid, alternator and mounting brackets.

**WARRANTY, STEERING (1) YEAR, UNLIMITED**

Coverage shall include: Steering gear box and power steering pump.

**WARRANTY, ENGINE COOLING SYSTEM, (1) YR / UNLIMITED**

Coverage shall include: Radiator core, radiator tanks, cooling fan, fan hub assembly and mounting brackets and braces.

**WARRANTY, AXLES (3) Yr/UNLIMITED**

Coverage shall include: Front axle beams, spindles, drive axle differential assembly, axle shafts and housing, and all internal lubricated parts. Excludes driveline's, input and output seals, kingpins and kingpin bearings, tie rod ends, and front and rear axle attachments such as hubs, wheel seals and wheel bearings.

**WARRANTY, SUSPENSION (1) YR, UNLIMITED**

Coverage shall include; Steel springs, spring hanger brackets, axle mounting brackets, U-bolts, shackles and pins and torque rods less bushings.

**FRAME RAILS WARRANTY**

Coverage shall be lifetime coverage limited to breaking or cracking of factory installed frame rails, frame rail liners, frame rail extensions, and any item(s) factory welded to them.

**CROSSMEMBERS WARRANTY**

There shall be a five (5) year / unlimited hours coverage to include cross members, gussets, and huck-mounting bolts that attach gussets to cross members and gussets/cross members to frame rails. Excludes any bolt-on item attached with either conventional or huck bolts.

**CAB STRUCTURE AND SHEET METAL WARRANTY**

There shall be a ten (10) year unlimited hours warranty coverage to include cab, structural components, sheet metal panels, doors, and hoods.

**CAB CORROSION / PERFORATION WARRANTY**

There shall be a 10 year unlimited hours coverage limited to rust-through or perforation of the cab due to corrosion from within.

**WARNING EQUIPMENT WARRANTY**

There shall be a 3 year unlimited hours coverage to include emergency light bar and components, strobe light power supply, electronic and / or electromechanical siren and speaker(s). Warranty coverage excludes consumable parts.

**BODY WARNING EQUIPMENT WARRANTY**

There shall be a 3 year unlimited hours coverage to include emergency light bar and components, strobe light power supply, electronic and / or electromechanical siren and speaker(s). Warranty coverage excludes consumable parts.

**WARRANTY, ALF BODY (1) YR UNLIMITED HOURS**

Warranty coverage includes fire pump panel and controls; foam system and controls; foam system plumbing; body emergency lighting and controls; hinged and rollup compartment doors; body trim;

body lighting and controls; body electrical systems; hydraulic ground ladder rack and controls.

**WARRANTY, BODY STRUCTURE AND CORROSION (10) YR**

Warranty coverage includes compartments and body panels; hinged compartment doors; fire pump closure; body frame and sub-frame, if applicable. Excludes surface corrosion caused by chips or scratches.

**WARRANTY, PAINT, CUSTOM CAB (7) YR (US/CAN)**

Warranty coverage includes all factory-painted exterior surfaces (except those included in chassis paint coverage) against orange peel, peeling or delaminating, cracking or checking or loss of gloss due to cracking, checking or hazing. Excludes lack-of-gloss issues on vehicles painted with low gloss colors; the undersides of hoods and roof and side mounted air fairings; and any damages to the paint or painted surface such as chips and scratches.

**WARRANTY, BODY PAINT, (7) YR, UNLIMITED HOURS**

Coverage includes all factory-painted exterior body surfaces. Warranted against orange peel; peeling/delaminating; cracking or checking; loss of gloss due to cracking, checking, or hazing. Excludes lack-of-gloss issues on vehicles painted with low gloss colors; the undersides of hoods and roof and side mounted air fairings; and any damages to the paint or painted surface such as chips and scratches.

**WARRANTY, AERIAL DEVICE PAINT, (7) YR, UNLIMITED HOURS**

Warranted against fading, cracking, checking, lack of adhesion, or material defect.

**WARRANTY, CHASSIS PAINT, (6) MONTH UNLIMITED**

Coverage includes all factory painted surfaces on frame rails, cross members/gussets, front and rear bumpers, suspension components, power train components, driveline's, fuel tanks, air tanks, wheel end equipment, tool boxes, battery boxes, access steps, and attaching brackets and hardware against peeling or non-adhesion.

**WARRANTY, CORROSION, (6) MONTH/ UNLIMITED HOURS**

Provides warranty against corrosion to any metal or metal alloy part of the vehicle.

**WARRANTY, AERIAL DEVICE STRUCTURE/CORROSION (20) YRS/UNLIMITED**

Coverage includes aerial device, torque box, outriggers and stabilizers. Excludes surface rust or corrosion caused by chips or scratches.

**WARRANTY, AERIAL DEVICE, (1) YR**

Coverage includes hydraulic system (gauges, hoses, seals, valves, lift cylinders, hydro/electric swivel and motors [rotation and extension/retraction]); electrical system (switches, wiring, intercom, lights, cables, and cord reels); device components (rotation bearing, slide pads, extension/retraction cables); waterway components (couplings, plumbing, swivel, and controls).

**WARRANTY, (10) YEAR LIMITED, (3) SECTION WATERWAY**

There shall be a ten (10) year limited warranty covering the waterway between the waterway swivel and the monitor at the tip, including the waterway seals.

**SINGLE MANUFACTURER REQUIREMENTS**

The cab, chassis, aerial device, and body shall be manufactured by a single manufacturer/builder to ensure compatibility, serviceability, and to eliminate divided responsibility. Statements indicating that the bidder's service center honors all warranties or that a chassis is manufactured to the proposer's specifications shall not comply with the intent of this requirement. There shall be no exception to the single source manufacturer requirement.

**LICENSING REQUIREMENT**

All proposers must have any and all current licenses required by state law to do business in the State of Texas. This is to include both Motor Vehicle Manufacturer and Automotive Dealer licenses. If the proposer is "second stage" vehicle manufacturer bidding direct and not through a dealer or distributor, the proposer shall enclose copies of their Manufacturer and Automotive Dealer licenses.

If the proposer is a dealer or distributor, then they shall submit a copy of their Motor Vehicle Manufacturer license of the "second stage" Vehicle Manufacturer they are proposing and their own Dealer license. Bids failing to meet this legal requirement shall be rejected. All proposers shall approve the following information with their proposal:

State Motor Vehicle Dealer License # \_\_\_\_\_  
Expiration Date \_\_\_\_\_

State Motor Vehicle Manufacturer's License # \_\_\_\_\_  
Expiration Date \_\_\_\_\_

**DRAWINGS REQUIREMENTS**

Drawings of the proposed apparatus shall be submitted with the bid. These drawings shall be an important tool in evaluating the bids. They shall also insure that the purchaser understands the apparatus being proposed by the bidder. These drawings shall depict the driver's side, top, front, and rear views.

Drawings supplied shall be specifically for HCC. Any drawings that are similar to or general in design are not acceptable and shall be considered non-compliant. Bids submitted without the required drawings shall not be accepted.

**LOCAL REPRESENTATION**

To assure HCC that prompt, professional and accurate representation is made on behalf of the manufacturer, a factory authorized dealership within a reasonable distance from the HCC facility located at 555 Community College Drive, Houston, TX shall be licensed by the State of Texas to sell vehicles. This dealership shall be competent and knowledgeable with respect to the sales and service of the emergency apparatus that the selected manufacturer produces.

The dealership shall have available twenty-four (24) hours a day factory, trained and authorized service technicians who are completely trained in the servicing and maintenance of the apparatus offered. The local dealership shall attend all contract review meetings, pre-construction meetings, inspection trips, and completed unit delivery to HCC.

**SERVICE ABILITY REQUIREMENTS**

HCC places a very high priority on service. All bidders shall therefore provide complete details of their ability to service the apparatus proposed, including but not limited to the following:

1. Service Facility: Size, location(s), bays, paint and body capabilities.
2. Service Vehicles: Number and limitations.
3. Certified Service Employees: Number of NAEVT Certified technicians.
4. Service: Hours of operation.
5. Parts volume at location(s) and emergency contingency offerings.

The Service Ability section of these specifications will be a major factor in determining the successful bidder. Limited manpower does not allow for the apparatus to be taken to various places for repairs. It is the desire of HCC that repairs to the apparatus which can be reasonably accomplished in the fire station shall be done so to reduce the out of service time of the apparatus.

The bidder's authorized service center shall have fully equipped service vehicles, which shall carry spare parts and repair equipment needed to work on the apparatus proposed.

The bidder's service center shall have a fully enclosed and heated facility which shall be located within a reasonable distance of the HCC facility located at 555 Community College Drive, where the apparatus proposed will be housed after delivery. The service center shall have adequate security to protect the HCC equipment while undergoing necessary service or repair. The service center shall be certified by the apparatus builder and shall be able to provide body, paint, fire pump, aerial ladder, electrical, hydraulic, HVAC, chassis repairs, engine repairs, and transmission repairs.

The local service center shall be available for an inspection by designated representatives of HCC prior to bid award.

**There shall be no exception to the service ability requirements.**

**SERVICE ABILITY FORM** (Bidders shall provide the below information with their bids)

1. Bidder's authorized service center location:

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2. Next closest location:

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3. Is this facility an authorized warranty center for the apparatus builder?

\_\_\_\_ Yes                      \_\_\_\_ No

4. Which other vehicle brands is this facility authorized for?

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5. Square footage of service center: \_\_\_\_\_
6. Number of service bays: \_\_\_\_\_
7. Is the service center enclosed? \_\_\_\_ Yes \_\_\_\_ No
8. Is the vehicle parking lot fenced and gated? \_\_\_\_ Yes \_\_\_\_ No
9. Is the service center heated? \_\_\_\_ Yes \_\_\_\_ No
10. Is the service center protected by fire and burglar alarms? \_\_\_\_ Yes \_\_\_\_ No
11. Hours of Service Operation:
- \_\_\_\_\_ AM to \_\_\_\_\_ PM - Monday through Friday  
 \_\_\_\_\_ AM to \_\_\_\_\_ PM - Saturday  
 \_\_\_\_\_ AM to \_\_\_\_\_ PM - Sunday
12. Hours of Parts Operation:
- \_\_\_\_\_ AM to \_\_\_\_\_ PM - Monday through Friday  
 \_\_\_\_\_ AM to \_\_\_\_\_ PM - Saturday  
 \_\_\_\_\_ AM to \_\_\_\_\_ PM - Sunday
13. Number of full time service center employees: \_\_\_\_\_
14. Number of full time technicians with NAEVT certification: \_\_\_\_\_
15. Number of fully equipped mobile service vehicles: \_\_\_\_\_
16. Are service vehicles and technicians available "on scene" during major response incidents?  
 Yes \_\_\_\_ No \_\_\_\_
17. Is the service center equipped to handle the following without subletting:
- \_\_\_\_ Yes \_\_\_\_ No    Body repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Electrical repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Paint work  
 \_\_\_\_ Yes \_\_\_\_ No    HVAC repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Welding, aluminum  
 \_\_\_\_ Yes \_\_\_\_ No    Welding, stainless steel  
 \_\_\_\_ Yes \_\_\_\_ No    Aerial repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Hydraulic repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Frame & spring repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Metal water tank repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Nonmetallic water tank repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Engine repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Transmission repairs  
 \_\_\_\_ Yes \_\_\_\_ No    Fire pump and plumbing repairs

Service center name: \_\_\_\_\_  
 Authorized representative: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

## ATTACHMENT NO. 4

### GENERAL TERMS AND CONDITIONS

1. **Contract Award**

A response to the solicitation is an offer to contract with Houston Community College System ("HCC") based on the terms and conditions contained therein. Proposals do not become contracts until they are accepted by HCC through issuance of written purchase orders or other duly executed documents.

2. **Delivery Point**

The vehicle shall be delivered to the following location/address:

Houston Community College  
Northeast College, Codwell Campus  
555 Community College Drive  
Houston, TX 77013

3. **Interpretation, Jurisdiction and Venue**

The Contract shall be construed and interpreted solely in accordance with the laws of the State of Texas. Venue of any suit, right or cause of action arising under or in connection with the contract shall be exclusively in Harris County, Texas.

4. **Compliance with Laws**

The Contractor shall give all notices and comply with all Federal, State of Texas and local laws. Upon request, the Contractor shall furnish to HCC certificates of compliance with all such laws.

5. **Taxes**

HCC is tax exempt as a governmental subdivision of the State of Texas under Section 501C (3) of the Internal Revenue Code. Limited Sales Tax Number: 1-74-1709152-1.

6. **Termination for Convenience**

HCC may, at its option and discretion, terminate or reduce the statement of work or other requirements of the contract at any time, without any default on the part of the Contractor, by giving thirty (30) calendar days written notice thereof to the Contractor.

7. **Termination for Default**

HCC may terminate the contract immediately for default, by giving written notice thereof to the Contractor, if the Contractor neglects to execute the work properly; performs in an unsatisfactory manner or fails to perform any provisions of the contract. In the event of termination for default, HCC shall have against the Contractor, all remedies provided by law and equity.

8. **Ethics Conduct**

Any direct or indirect actions taken to unduly influence competitive purposes, to circumvent equal consideration for competitive bidders, or to disregard ethical and legal trade practices will disqualify vendors and contractors from current and future consideration for participation in HCC orders and contracts.

9. **Small Business Development Program (SBDP)**

The Contractor hereby agrees to attain small business participation in the amount of \_\_\_\_% of the total contract amount. The Contractor agrees to enter into agreements for the Work identified in Exhibit \_\_\_\_, entitled Contractor and First Tier Subcontractor/Supplier Participation. The subcontracting goal applies to all vendors regardless of their status. The Contractor's failure to comply with the aforementioned small business participation provisions may result in:

- Withholding of payment until such compliance is achieved or a waiver of the provisions is provided by HCC.
- Revocation of any benefits and incentives provided under the program or suspension or termination of the contract in whole or in part.

10. **Small Business Compliance**

The Contractor shall meet with the HCC Buyer and the HCC Small Business Representative at the 50% and 75% completion phases/dates of the contract, to verify small business participation activity and to ensure compliance with the small business goal stated in the contract, if any.

11. **Prime Contractor/Contract for Services**

If this contract is for services, the Contractor shall perform a minimum of 30% of the work with its labor force or demonstrate management of the work to the satisfaction of HCC.

12. **Changes**

HCC shall have the right, at any time, to make changes within the scope of the contract. If such change causes a material increase in the Contractor's cost and/or the time for performance, the Contractor shall so notify HCC in writing within ten (10) calendar days from the date of the contractor's receipt of the notice of change, and an equitable adjustment in the price and/or the time of performance shall be mutually agreed upon between the parties. No such change shall be effective in the absence of express written direction of HCC.

13. **Insurance Requirements**

The Contractor agrees to comply with the insurance requirements contained in Exhibit H.

14. **Indemnification**

The Contractor shall hold HCC, its agents, employees, trustees and other officers harmless from any claim or liability asserted against it by reason of the negligence of the Contractor, its agents, servants and employees in the performance of the Contract.

15. **Independent Contractor**

It is agreed and understood that the Contractor shall be deemed to be an independent contractor in all its operations and activities hereunder; that the employees furnished by the Contractor to perform the services required by the contract shall be deemed to be Contractor's employees or independent subcontractors; that Contractor's employees shall be paid by the Contractor; that Contractor and its employees shall be responsible for all obligations and reports covering social security, unemployment insurance, income tax, and other reports and deductions required by State and Federal law.

16. **Assignment**

The Contractor may not assign or transfer any of its rights, duties or obligations under this Agreement, in whole or in part, without the prior written consent of HCC. This contract shall inure to the benefit of, and be binding upon, the parties hereto and their respective successors and permitted assigns.

17. **Notices**

All notices hereunder by either party to the other shall be in writing, delivered personally, by certified or registered mail, return receipt requested, or by overnight courier, and shall be deemed to have been duly given when delivered personally or when deposited in the United States mail, postage prepaid addressed as follows:

**Houston Community College System:**  
Procurement Operations (11<sup>th</sup> Floor)  
3100 Main Street

**Contractor:**

\_\_\_\_\_  
\_\_\_\_\_

Houston, Texas 77002  
ATTN: Michael Kyme,  
Executive Director, Procurement Operations

\_\_\_\_\_  
ATTN: \_\_\_\_\_

**18. Invoicing and Payment**

The Contractor shall submit an original invoice to the address shown below for the goods or services which have been inspected and accepted by HCC:

Houston Community College System  
Accounts Payable  
P.O. Box 667460  
Houston, Texas 77266-7460  
Reference Project No. 07-34 and the applicable purchase order number.

Generally, payment will be made within thirty (30) calendar days after receipt of a properly prepared invoice or acceptance of the goods or services, whichever is later. Payment shall be considered made when HCC deposits the Contractor's payment in the mail or the date on which an electronic transfer of funds occurs.

**19. Drug Policy**

HCC is a drug-free workforce and workplace. The manufacture, sale, distribution, Dispensation, or use of illegal drugs or alcohol by the Contractor or its employees while on HCC's premises is strictly prohibited. Any violation of this provision by the Contractor or its employees will be considered a breach of contract by the Contractor.

**20. Appropriated Funds**

The purchase of any service or product under this contract beyond the initial contract period is contingent upon the availability of appropriated funds. HCC shall have the right to cancel this contract at the end of the current fiscal year if funds are not allotted for the next fiscal year to continue this contract. If funds are withdrawn or do not become available, HCC reserves the right to cancel this contract by giving the Contractor a thirty (30) day written notice of cancellation without penalty. Upon cancellation of this contract, HCC shall not be responsible for any payment of any service or product received that occur after the end of the current contract period. HCC fiscal year begins on September 1 and ends on August 31<sup>st</sup>.

**21. Entire Agreement**

This Contract and its accompanying exhibits contain the entire understanding of the parties regarding the services or materials provided and supersede all prior agreements, oral or written, and all other communications between the parties relating to the subject matter. This Agreement may not be amended or modified, except by mutual written agreement.

**CONTRACTOR AND FIRST TIER SUBCONTRACTOR/SUPPLIER PARTICIPATION FORM**

Bidder/offerer presents the following participants in this solicitation and any resulting Contract. All bidders / offerers, including small businesses bidding as prime contractors, are required to demonstrate good faith efforts to include eligible small businesses in their bid submissions as subcontractors and/or suppliers.

| CONTRACTOR        | Type of Work to be Performed or Materials Supplied | Indicate if Small Business, DBE, HUB, MBE, etc. | Percent of Contract Effort | Price |
|-------------------|--|---|----------------------------|-------|
| Business Name:    |  |   |                            |       |
| Business Address: |  |   |                            |       |
| Telephone No. :   |  |   |                            |       |
| Contact Person:   |  |   |                            |       |
| SUBCONTRACTORS    |  |   |                            |       |
| Business Name:    |  |   |                            |       |
| Business Address: |  |   |                            |       |
| Telephone No. :   |  |   |                            |       |
| Contact Person:   |  |   |                            |       |
| Business Name:    |  |   |                            |       |
| Business Address: |  |   |                            |       |
| Telephone No. :   |  |   |                            |       |
| Contact Person:   |  |   |                            |       |
| SUPPLIERS         |  |   |                            |       |
| Business Name:    |  |   |                            |       |
| Business Address: |  |   |                            |       |
| Telephone No. :   |  |   |                            |       |
| Contact Person:   |  |   |                            |       |
| Business Name:    |  |   |                            |       |
| Business Address: |  |   |                            |       |
| Telephone No. :   |  |   |                            |       |
| Contact Person:   |  |   |                            |       |

Submitted by: \_\_\_\_\_ Business Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone/Fax: \_\_\_\_\_ Date: \_\_\_\_\_

Contractor \$ \_\_\_\_\_  
 Subcontractor(s) \$ \_\_\_\_\_  
 Supplier (s): \$ \_\_\_\_\_

**ATTACHMENT NO. 6**

**HOUSTON COMMUNITY COLLEGE SYSTEM  
SUBCONTRACTOR / SUBCONSULTANT / SUPPLIER PAYMENT CERTIFICATION FORM**

**HCC Project No. 07-34**

(This form is to be completed by the Subcontractor/Subconsultant or Supplier for each payment received from the Prime Contractor/Consultant.)

NAME OF FIRM: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

The above firm is a: (check one)

- Subcontractor
- Subconsultant
- Supplier

I hereby certify that the above firm received payment on \_\_\_\_\_ from \_\_\_\_\_ in the amount of  
(date) (enter name of prime contractor)  
\$ \_\_\_\_\_ as full payment of Invoice No. \_\_\_\_\_ dated \_\_\_\_\_ for work performed or materials provided  
during \_\_\_\_\_ under HCC Project No. 07-34  
(enter dates)

**Note:** This form shall be completed and signed by an Officer of the firm. Attach this form to each invoice for payment.

Signature \_\_\_\_\_

Printed or Typed Name \_\_\_\_\_

Title \_\_\_\_\_

Date: \_\_\_\_\_

**ATTACHMENT NO. 7**

**HOUSTON COMMUNITY COLLEGE SYSTEM  
PROGRESS ASSESSMENT REPORT OF WORK SUBCONTRACTED FORM**

Reporting Period: From \_\_\_\_\_ To \_\_\_\_\_

Consultant / Contractor: \_\_\_\_\_ HCC Project No. 07-34

Total Contract Amount (Prime Contractor) \$ \_\_\_\_\_

| Subconsultant / Subcontractor / Supplier (Name) | Total Subcontract Amount | Amount Paid This Period<br>\$ _____ | Total Paid to Date<br>\$ _____ |
|---|--------------------------|-------------------------------------|--------------------------------|
|   |                          |                                     |                                |
|   |                          |                                     |                                |
|   |                          |                                     |                                |
|   |                          |                                     |                                |
|   |                          |                                     |                                |
|   |                          |                                     |                                |

I hereby certify that \_\_\_\_\_ has made timely payments from proceeds of prior payments, and will make payments within  
(enter name of prime contractor)

five (5) calendar days of receipt of funds now due from HCC to our subcontractors and suppliers in accordance with contractual arrangements with them.

**Note:** This form shall be completed and signed by an officer of the firm. Attach this form to each invoice for payment.

Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Date: \_\_\_\_\_

## ATTACHMENT NO. 8

### INSURANCE REQUIREMENTS

#### INSURANCE REQUIREMENTS

The following coverage and limits are the minimum limits that the Vendor/Contractor is required to carry during performance of the contract to manufacture, supply, and deliver one (1) Fire Apparatus, HCC No. 07-34.

**1. Commercial General Liability for Bodily Injury / Property Damage Limits:**

- a. Occurrence / Personal Injury / Advertising /
- b. Products / Completed Operations \$1,000,000 CSL
- c. Annual Aggregate \$2,000,000 CSL
- d. Products Aggregate \$2,000,000 CSL
- e. Fire, Legal \$1,000,000 CSL
- f. Medical Expense \$5,000 Per Person

**2. Automobile Liability:**

Bodily Injury / Property Damage \$1,000,000 CSL

**3. Workers Compensation:**

Part A- Statutory  
Part B - \$1,000,000 Each Accident  
\$1,000,000 Policy Limits  
\$1,000,000 Each Employee

**4. Endorsements:**

The following endorsements and other stated information is required on the original Certificate of Insurance:

- 90 Day Notice of Cancellation.
- Houston Community College System be named as Additional Insured on all policies except the Workers Compensation.
- Waiver of Subrogation on all policies.
- The assigned project number and/or purchase order number.

**5. Submission of Certificate of Insurance:**

Certificate of Insurance to be furnished to HCCS Risk Management Office, PO Box 667517, Houston, TX 77266, fax # (713) 718-5177 indicating the limits and coverages as outlined above within 14 calendar days after receipt of a written purchase order or some other duly executed contract document issued by HCCS.

**ATTACHMENT NO. 9**

**HCC PROJECT NO. 07-34**

**HOUSTON COMMUNITY COLLEGE SYSTEM  
DETERMINATION OF GOOD FAITH EFFORT FORM**

Proposer \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ Fax Number \_\_\_\_\_

In making a determination that a good faith effort has been made, HCC requires the Proposer to complete this form and submit supporting documentation explaining in what ways the Proposer has made a good faith effort to attain the small business goal. The Proposer will respond by answering "yes" or "no" to the following and provide supporting documentation:

- \_\_\_\_\_ (1) Whether the Proposer provided written notices and/or advertising to at least five (5) certified small businesses or advertised in general circulation, trade association and/or small businesses focus media concerning subcontracting opportunities.
- \_\_\_\_\_ (2) Whether the Proposer divided the work into the reasonable portions in accordance with standard industry practices.
- \_\_\_\_\_ (3) Whether the Proposer documented reasons for rejection or met with the rejected small business to discuss the rejection.
- \_\_\_\_\_ (4) Whether the Proposer negotiated in good faith with small businesses, not rejecting qualified subcontractors who were also the lowest responsive bidder.

**NOTE:** If the Proposer is unable to meet the solicitation goal or if any of the above items (1-4) are answered "no", the Proposer must submit a letter of justification.

\_\_\_\_\_  
Signature of Proposer

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**ATTACHMENT NO. 10  
SMALL BUSINESS UNAVAILABILITY CERTIFICATION FORM**

I, \_\_\_\_\_, \_\_\_\_\_  
 (Name) (Title)

Of \_\_\_\_\_, certify that on the date(s) shown below, the small businesses listed herein were  
 (Business name) contacted to obtain Bids for Materials or Services to be utilized on  
 HCC Project No. 07-34

| DATE CONTACTED | SMALL BUSINESS | TELEPHONE NO. | CONTACT PERSON | MATERIALS OR SERVICES | RESULTS |
|----------------|----------------|---------------|----------------|-----------------------|---------|
| 1.             |                |               |                |                       |         |
| 2.             |                |               |                |                       |         |
| 3.             |                |               |                |                       |         |
| 4.             |                |               |                |                       |         |
| 5.             |                |               |                |                       |         |
| 6.             |                |               |                |                       |         |

To the best of my knowledge and belief, said small business was unavailable for this solicitation, unable to prepare a proposal or prepared a proposal that was rejected for the reason(s) stated in the RESULTS column above.

The above statement is a true and accurate account of why I am unable to commit to awarding subcontract(s) or supply order(s) to the small business listed above.

**NOTE: This form to be submitted with all Proposer's documents for Waiver of small business participation. (See Instructions to Proposers)**

Signature: \_\_\_\_\_  
 (Proposer)

**SMALL BUSINESS DEVELOPMENT QUESTIONNAIRE**

**Note:** Vendors are to complete this form along with a **copy** of the Contractor and First Tier Subcontractor/Supplier Participation Form and return them in a separately sealed envelope addressed to:

**Houston Community College System  
Procurement Operations/Small Business Development  
Post Office Box 667517  
Houston, Texas 77266-7517**

FIRM NAME: \_\_\_\_\_

FIRM ADDRESS: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

FAX NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

CONTACT PERSON'S NAME AND PHONE NO. \_\_\_\_\_

SIGNATURE OF FIRM'S AUTHORIZED OFFICIAL: \_\_\_\_\_

NAME AND TITLE (Type or Print): \_\_\_\_\_

**COMPANY MAJORITY OWNERSHIP** (Check one in each column)

ETHNICITY

GENDER

LOCATION

\_\_\_ African American (AA)

\_\_\_ Male

\_\_\_ Houston (H)

\_\_\_ Asian Pacific American (APA)

\_\_\_ Female

\_\_\_ Texas (T)

\_\_\_ Caucasian ( C)

\_\_\_ Out of State (O)

\_\_\_ Hispanic American (HA)

Specify State \_\_\_\_\_

\_\_\_ Native American (NA)

\_\_\_ Public Owned (PO)

\_\_\_ Other (O) Specify \_\_\_\_\_

**BUSINESS CLASSIFICATION**

\_\_\_ **DBE** Disadvantaged Business Enterprise

\_\_\_ **SB** Small Business

\_\_\_ **WBE** Women Owned Business Enterprise

\_\_\_ **MBE** Minority Business Enterprise

\_\_\_ **HUB** Historically Underutilized Business

\_\_\_ Other: \_\_\_\_\_

Please provide information regarding certifying agency (if any)

Name of Agency

Certificate Number

Expiration Date

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ATTACHMENT NO. 12**

**NON-DISCRIMINATION STATEMENT**

The undersigned certifies that he/she will not discriminate against any employee or applicant for employment or in the selection of subcontractors because of race, color, age, religion, gender, national origin or disability. The undersigned shall also take action to ensure that applicants are employed, and treated during employment, without regard to their race, color, religion, gender, age, national origin or disability. Such action shall include, but shall not be limited to the following: employment, upgrading or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other compensation, and selection for training, including apprenticeship.

Name/Title: \_\_\_\_\_  
(Type or Print)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name: \_\_\_\_\_  
(Type or Print)

Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

**ATTACHMENT NO. 13**

**CERTIFICATION AND DISCLOSURE STATEMENT**

A person or business entity entering into a contract with HCC is required by Texas Law to disclose, in advance of the contract award, if the person or an owner or operator of the business entity has been convicted of a felony. The disclosure should include a general description of the conduct resulting in the conviction of a felony as provided in section 44.034 of the Texas Education Code. The requested information is being collected in accordance with applicable law. **This requirement does not apply to a publicly held corporation.**

If an individual: YES or NO  
Have you been convicted of a felony? \_\_\_\_\_

If a business entity: YES or NO  
\_\_\_\_\_

Has any owner of your business entity been convicted of a felony? \_\_\_\_\_

Has any operator of your business entity been convicted of a felony? \_\_\_\_\_

If you answered yes to any of the above questions, please provide a general description of the conduct resulting in the conviction of the felony, including the Case Number, the applicable dates, the State and County where the conviction occurred, and the sentence. I attest that I have answered the questions truthfully and to the best of my knowledge.

By: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Business Entity: \_\_\_\_\_

Signature of Firm's Authorized Official: \_\_\_\_\_

State of : \_\_\_\_\_

sworn to and subscribed before me at \_\_\_\_\_

this the \_\_\_\_\_ day of \_\_\_\_\_, 2007

Notary Public for the State of : \_\_\_\_\_

**ATTACHMENT NO. 14**

**STATE AFFIDAVIT**

This company, contractor, or subcontractor agrees to refrain from discrimination in terms and conditions of employment on the basis of race, color, religion, sex, physical handicap, or national origin, and agrees to take affirmative action as required by Federal Statutes and Rules and Regulations issued pursuant thereto in order to maintain and ensure nondiscriminatory employment practices.

Signed: \_\_\_\_\_

Name of Company: \_\_\_\_\_

Address of Company: \_\_\_\_\_

**State of :** \_\_\_\_\_

Sworn to and subscribed before me at \_\_\_\_\_

this the \_\_\_\_\_ day of \_\_\_\_\_, 2007.

Notary Public for the State of : \_\_\_\_\_

**ATTACHMENT NO. 15  
BUSINESS QUESTIONNAIRE**

FIRM NAME: \_\_\_\_\_

FIRM ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

TELEPHONE: \_\_\_\_\_

FAX NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

CONTACT PERSON'S NAME AND PHONE NO. (Type or Print):  
\_\_\_\_\_

SIGNATURE OF FIRM'S AUTHORIZED OFFICIAL: \_\_\_\_\_

NAME AND TITLE (Type or Print): \_\_\_\_\_

Do you or any officer, partner, owner, sales representative and/or spouse work for the Houston Community College System? \_\_\_\_\_ Yes \_\_\_\_\_ No

If yes, please specify: \_\_\_\_\_

State in which your home office / headquarters is located \_\_\_\_\_?

If headquarters is located out of state, does that state have preferential treatment on Bids? \_\_\_\_\_  
If yes, list percentage. \_\_\_\_\_%

Name of Financial Institution \_\_\_\_\_ Contact Person \_\_\_\_\_  
Title \_\_\_\_\_

Please indicate how you became aware of this procurement? Source: \_\_\_\_\_

*Example: Newspapers (Chronicle, El Dia, Houston Star, African American News, etc.)(Houston Minority Business Council, HCC Website, Chamber of Commerce, etc.)*



**ATTACHMENT NO. 16**

**ASSURANCE OF SBDP GOAL**

The undersigned certifies that he/she has read, understands and agrees to be bound by the small business provisions set forth in this Solicitation. The undersigned further certifies that he/she is legally authorized to make the statements and representations in the Solicitation and that said statements and representations are true and accurate to the best of his/her knowledge. The undersigned will enter into formal agreement(s) for work identified on the **CONTRACTOR AND FIRST TIER SUBCONTRACTOR PARTICIPATION** form conditioned upon execution of a contract with HCC. The undersigned agrees to attain the small business utilization percentages of the total offer amount as set forth below:

**Small Business Participation Goal = Best Effort**

The undersigned certifies that the firm shown below has not discriminated against any small business or other potential subcontractor because of race, color, religion, gender, age, veteran's status, disability or national origin, but has provided full and equal opportunity to all potential subcontractors irrespective of race, color, religion, gender, age, disability, national origin or veteran status.

The undersigned understands that if any of the statements and representations are made knowing them to be false or there is a failure to implement any of the stated commitments set forth herein without prior approval of HCC's Chancellor or the duly authorized representative, the Bidder may be subject to the loss of the contract or the termination thereof resulting from this bid and could be ineligible for future HCC contract awards.

Signature \_\_\_\_\_

Title \_\_\_\_\_ Date of Signing \_\_\_\_\_

Firm Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

Telephone Number \_\_\_\_\_

**ATTACHMENT NO. 17**  
**VENDOR APPLICATION INSTRUCTIONS**

Houston Community College System ("HCC") Procurement Operations has developed an online vendor application system. This system is designed to allow firms or individuals that are interested in doing business with HCC to register online and become part of our vendor database. Once registered, you will receive a password and personal login information that will allow you to modify your vendor information anytime a change occurs with your company. You will have the flexibility to add or delete commodity lines, update phone numbers and contact information, etc. This database will allow HCC to notify, via email, all companies that match the desired commodity criteria for procurement opportunities within HCC. What a great way to never miss out on an HCC bid or proposal opportunity again.

Please take a moment to go to the Houston Community College System Procurement Operations website and register as a vendor. The website address to access the vendor registration form is [http://216.119.142.201/HCCS/Supplier\\_Registration\\_Form.asp](http://216.119.142.201/HCCS/Supplier_Registration_Form.asp)

Once you have completed your application, please print out a copy of the completed application and submit it with your completed bid package. If you do not have internet access you are welcome to use a computer at any HCC library to access the website and register.

**ATTACHMENT NO. 18**

**CONFLICT OF INTEREST QUESTIONNAIRE**

**CONFLICT OF INTEREST QUESTIONNAIRE FORM CIQ**

**For vendor or other person doing business with local government entity**

This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the government entity.

OFFICE USE ONLY

Date Received

By Law this questionnaire must be filled with the records administrator of the local government not later than the 7<sup>th</sup> business day after the date the person becomes aware of facts that require the statement to be filed. See Section 76.006, Local Government Code.

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

1 Name of Person doing business with local government entity.

2 . Check this box if you are filing an update to a previous questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7<sup>th</sup> business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 Describe each affiliation or business relationship with an employee or contractor of the local government entity who makes recommendations to a local government officer of the local government entity with respect to the expenditure of money.

4 Describe each affiliation or business relationship with a person who is a local government officer and who appoints or employs a local government officer of the local government entity that is the subject of this questionnaire.

CONFLICT OF INTEREST QUESTIONNAIRE FORM CIQ  
For vendor or other person doing business with local government entity

5 Name of local government officer with whom filer has affiliation or business relationship. (Complete this section only if the answer to A, B, or C is YES.)

This section, item 5 including subparts A, B, C, & D, must be completed for each officer with whom the filer has affiliation or business relationship. Attach additional pages to the Form CIQ as necessary.

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

Yes No

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

Yes No

C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10% or more?

Yes No

D. Describe each affiliation or business relationship.

6 Describe any other affiliation or business relationship that might cause a conflict of interest.

7 \_\_\_\_\_ Date  
Signature of person doing business with the government entity

**Houston Community College System  
Procurement Operations**



**SAMPLE CONTRACT DOCUMENTS**

**By and Between**

**HOUSTON COMMUNITY COLLEGE SYSTEM**

**AND**

---

**FOR**

**Fire Apparatuses**

**HCC PROJECT NO. 07-34**

**SAMPLE CONTRACT EXHIBITS**

**EXHIBIT A  
PROPOSAL / AWARD FORM**

Note: (Attachment No. 1 of this solicitation may become Exhibit A in the resulting contract.)

**EXHIBIT B  
SCHEDULE OF ITEMS AND PRICES**

Note: (Attachment No. 2 of this solicitation may become Exhibit B in the resulting contract.)

**EXHIBIT C  
SCOPE OF SERVICES**

Note: (Attachment No. 3 of this solicitation may become Exhibit C in the resulting contract.)

**EXHIBIT D  
GENERAL TERMS AND CONDITIONS**

Note: (Attachment No. 4 of this solicitation may become Exhibit D in the resulting contract.)

**EXHIBIT E  
CONTRACTOR AND FIRST TIER SUBCONTRACTOR/SUPPLIER PARTICIPATION FORM**

Note: (Attachment No. 5 of this solicitation may become Exhibit E in the resulting contract.)

**EXHIBIT F  
SUBCONTRACTOR/SUBCONSULTANT/SUPPLIER PAYMENT CERTIFICATION**

Note: (Attachment No. 6 of this solicitation may become Exhibit F in the resulting contract.)

**EXHIBIT G  
PROGRESS ASSESSMENT REPORT OF WORK SUBCONTRACTED**

Note: (Attachment No. 7 of this solicitation may become Exhibit G in the resulting contract.)

**EXHIBIT H  
INSURANCE REQUIREMENTS**

Note: (Attachment No. 8 of this solicitation may become Exhibit H in the resulting contract.)