City of Scottsbluff, Nebraska

Monday, September 15, 2014

Regular Meeting

Item Consent5

Council to approve specifications for a new fire engine and authorize the city clerk to advertise for bids to be received by October 17, 2014, 2:00 p.m..

Staff Contact: Dana Miller, Fire Chief

Agenda Statement

Item No._____

For meeting of: September 15th, 2014

AGENDA TITLE: Approve specifications for one new Fire Engine, and authorize the City Clerk to advertise for bids to be received until 2:00 P.M. on October 17th, 2014.

SUBMITTED BY DEPARTMENT/ORGANIZATION: Scottsbluff Fire Department

PRESENTATION BY: Rick Kuckkahn, City Manager

SUMMARY EXPLANATION: Replace 1996 Engine with new custom built Engine with funding already in place in MFO account.

BOARD/COMMISSION RECOMMENDATION:

STAFF RECOMMENDATION: Approve specifications and authorize City Clerk to advertise for bids.

EXHIBITS

Resolution Ordinance Contract Minutes Plan/Map

Other (specify)

NOTIFICATION LIST: Yes X No Further Instructions

APPROVAL FOR SUBMITTAL: _____
City Manager

Rev 2/6/07Cclerk
Master Agenda 2/6/07

INTENT OF SPECIFICATIONS

It is the City of Scottsbluff's intent that these specifications cover the furnishing and delivery to the City a complete apparatus equipped as hereinafter specified. With a view of obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the bidder, who shall be solely responsible for the design and construction of all features.

The apparatus shall conform to the requirements of the current (at the time of bid) National Fire Protection Association 1901 for Motor Fire Apparatus unless otherwise specified in these specifications.

Bids shall be considered only from companies which have a reputation for quality products in the field of fire apparatus construction and have been in business for a minimum of twenty (20) years.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. Computer run-off sheets are not acceptable as descriptive literature.
The specifications shall indicate size, type, model and make of all component parts and equipment.

TIMELY PROPOSALS

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, e-mails, telegrams, or telephone bids shall not be considered. All proposals must be received no later than 2:00pm MST on October 17th, 2014.

STATEMENT OF EXCEPTIONS TO NFPA 1901

If, at the time of delivery, the apparatus manufacturer is not in compliance, a statement of exceptions must be provided as follows:

- The specific standard affected.
- A statement describing why the manufacturer is not in compliance.
- A description of the remedy, and who the responsible party is.

The document must be signed by an officer of the company, and an authorized agent of the purchaser. **NO EXCEPTIONS**

QUALITY AND WORKMANSHIP

The design of the apparatus must embody the latest approved automotive engineering practices.

The workmanship must be the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged and ample safety factors must be provided to carry loads as specified and to meet both on and off road requirements and speed as set forth under "Performance Test and Requirements."

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be documented with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus. The successful bidder shall furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

1. The apparatus must be capable of accelerating to 30 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.
2. The service brakes shall be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.
3. The apparatus, fully loaded, shall be capable of obtaining speed of 50 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).
4. The apparatus shall be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.
5. The contractor shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Permission to keep and/or store the apparatus in any building owned or occupied by the City shall not constitute acceptance of same.

EXCEPTIONS TO SPECIFICATIONS

The following specifications shall be strictly followed by all bidders. Exceptions shall be considered if they are deemed equal to or superior to the specifications at the sole discretion of the City, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions shall be listed by page and paragraph.

Failure to denote exceptions in the above manner may result in automatic rejection of the bid. In addition a general statement taking "TOTAL EXCEPTION" to the specifications may result in immediate rejection of bid.

GENERAL CONSTRUCTION

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose shall be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association). Certified Laboratories certificate shall be submitted by the manufacturer. Weight of apparatus shall meet all federal axle load laws.

DELIVERY REQUIREMENTS

The apparatus shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the City of Scottsbluff, Nebraska. Any and all alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense.

PURCHASER RIGHTS

The City of Scottsbluff shall award the bid to the lowest and best responsible bidder to these specifications. The City reserves the right to reject any bid. The City also reserves the right to award in its best interest and reserves the right to waive any non-material formalities in a bid

U.S.A. MANUFACTURER

The entire apparatus shall be assembled within the borders of the Continental United States to ensure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

MANUFACTURER'S EXPERIENCE

Each manufacturer shall have been in business making similar apparatus for a minimum of twenty (20) years.

BID SEQUENCE

For ease of evaluation, all bid proposals shall be submitted in the same order as the fire department’s specification. **NO EXCEPTIONS.**

PROPOSAL DRAWING

A general layout drawing depicting the apparatus layout and appearance shall be provided with the bid. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views. The drawing shall be a depiction of the actual apparatus proposed and not of a generic similar product.

APPROVAL DRAWING

After the award of bid and pre-construction conference, a detailed layout drawing depicting the apparatus layout and appearance including any changes agreed upon shall be provided for customer review and signature. The drawing shall become part of the contract documents. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views.

PRE-CONSTRUCTION CONFERENCE

After award of the contract, and prior to construction of the apparatus, a pre-construction conference shall be held at the facility of the manufacturer. A provision shall be provided in the bid price for all travel, food and lodging to accommodate three (3) Fire Department personnel.

INSPECTION TRIPS

An inspection trip at the manufacturer's facility prior to delivery of the completed apparatus shall be provided. Accommodations for three (3) Fire Department personnel to include all transportation, food and lodging shall be included in the bid price. A total of 2 (two) inspection trips shall be included (1) pre-construction, (2) pre-final.

PROPOSAL GUARANTEE

A certified check or bid bond in the sum of ten percent (10%) of the total bid price shall be submitted with the "Bid Proposal" at the time of the bid. The full amount of the bid surety shall be returned to the unsuccessful bidders following the award of the contract to the successful bidder.

PERFORMANCE BOND

Within twenty (20) days of notification to the successful bidder by the purchaser, prior to any work commencing on the proposed apparatus, the successful bidder shall, at their own expense, obtain and submit to the purchasing entity a performance bond in the amount of 100% equal to the total contract price. Additionally, each bidder must disclose the price/amount it pays for bonding, per $1,000. This is to demonstrate the economic stability and credit worthiness of the bidder. NO EXCEPTIONS.

CHASSIS

The chassis shall be designed and manufactured for heavy-duty service with adequate strength and capacity of all components for the intended load to be sustained and the type of service required.

CUSTOM CAB

The cab shall be a full tilt 6-person cab designed specifically for the fire service.

CAB DESIGN

The cab shall be designed specifically for the fire service.
The apparatus chassis shall be of an engine forward, fully enclosed tilt cab design. There shall be four (4) side entry doors.
The cab shall be of a fully open design with no divider wall or window separating the front and rear cab sections.
The cab roof shall utilize extruded, radiused outer corner rails with integral drip channel and box tubing type cross brace supports.
The cab sides shall be constructed from extruded door pillars and posts that provide a finished door opening, extruded and formed wheel well openings supports, formed aluminum wheel well liners and box tubing type support braces.
The cab floor and rear cab wall shall utilize box tubing type framing and support bracing.
The framework shall be of a welded construction that fully unitizes the structural frame of the cab.
The structural extrusion framework shall be overlaid with interlocked aluminum alloy sheet metal panels to form the exterior skin of the cab.
The structural extrusion framework shall support and distribute the forces and stresses imposed by the chassis and cab loads and shall not rely on the sheet metal skin for any structural integrity.

CAB SUB-FRAME

The sub frame shall be painted to match the primary chassis color.
The sub-frame shall be mounted to the chassis through the use of lubricated Kaiser bushings for the front pivot point, and two (2) hydraulically activated cab latches, to secure the rear.

CAB TILT SYSTEM

An electrically powered hydraulic cab tilt system shall be provided, and shall lift the cab to an angle of 45 degrees, exposing the engine and accessories for service. The system shall be interlocked to only operate when the parking brake is set.
The lift system shall be comprised of two (2) hydraulic lift cylinders, an electrically driven hydraulic pump, and a control switch. A mechanical locking system shall be provided to ensure the cab remains in the raised position in the event of a hydraulic failure.

MANUAL CAB LIFT

There shall be a manually operated hydraulic pump for tilting the cab in case the main pump should fail.

CAB DIMENSIONS

The cab shall be designed to satisfy the following **minimum** width and length dimensions:
Minimum Cab Width (excluding mirrors) 96" **Minimum** Total Cab Length (excluding bumper) 124"

APPARATUS HEIGHT

Highest point of Apparatus will not exceed 11’6”

FENDER CROWNS
Polished stainless steel front axle fenderettes with full depth radiused wheel well, liners shall be provided.
GRILLE
The front of the cab shall be equipped with a stainless steel grille with sufficient area to allow proper airflow into the cooling system and engine compartment.
CAB INSULATION
The exterior walls, doors, and ceiling of the cab shall be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels shall not exceed 90 decibels at 45 mph in all cab seat positions. **NO EXCEPTIONS**
ROOF DESIGN
The cab shall be a 10” raised roof design with side drip rails.
EXTERIOR GLASS
The cab windshield shall be of a one or two piece curved design utilizing tinted, laminated, automotive approved safety glass. The window shall be held in place by an extruded rubber molding. The cab shall be painted prior to the window installation.
Two (2) fixed position side windows shall be provided between the forward cab area and the crew cab area, one (1) each side and shall utilize tinted, tempered automotive approved safety glass. The widows shall be approximately 20.5" high x 16.50" wide to provide maximum visibility. The side windows shall be held in place by an extruded rubber molding.
The cab door and canopy windows shall utilize tinted, automotive approved safety glass.
CAB STEPS
The lower cab steps shall be no more than 22" from the ground. An intermediate step shall be provided, mid way between the lower cab step, and the cab floor. The intermediate step shall be slightly inset to provide for safer ingress and egress. All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.
STEP LIGHTS
A white LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.
CAB STRUCTURAL INTEGRITY
The cab of the apparatus shall be designed and so attached to the vehicle as to eliminate, to the greatest possible extent, the risk of injury to the occupants in the event of an accident.
The apparatus cab shall be tested to specific load and impact tests with regard to the protection of occupants of a commercial vehicle.
A test shall be conducted to evaluate the frontal impact strength of the apparatus cab to conform to the test J2420 and the “United Nations Regulation 29, Annex 3, paragraph 4, (Test A). A second test shall be conducted to evaluate the roof strength of the apparatus cab to conform to the Society Of Automotive Engineers (SAE) SAE J2422/SAE J2420 and “United Nations Regulation 29, Annex 3,

paragraph 5, (Test B) and SAE J2420. The evaluation shall consist of the requirements imposed by ECE Regulation 29, Paragraph 5.
The test shall be conducted by a certified independent third party testing institution.
A letter stating successful completion of the above test on the brand of cab being supplied shall be included in the bid.

SEAT BELT TESTING

The seat belt anchorage system shall be tested to meet FMVSS 207 Section 4.2a and FMVSS 210 section 4.2. Testing shall be conducted by an independent third party product evaluation company.
A copy of the certification letter shall be supplied with the bid documents.

POWER WINDOWS

All four(4) cab entry doors shall have power windows. Each door shall be individually operated and the driver's position shall have master control over all windows. The front windows shall roll down completely.

GLOVE BOX

A glove box shall be provided and located directly in front of the officer position.

DELUXE CONSOLE

There shall be a deluxe console mounted on the engine hood between the driver and officer. The console shall be covered in black vinyl material to match the engine hood. The console shall come complete with two drink holders, and recessed wells for storage of gloves, clipboards and other miscellaneous items.

INTERIOR DOOR PANELS

The interior of the cab entry doors shall have a brushed stainless steel scuff plate, contoured to the door, from the door sill down.
The lower portion of the doors shall also have a brushed stainless steel scuff plate and shall include a total of 245 square inches of reflective material on each door, exceeding the NFPA requirement of 96 square inches. The layout shall be opposing ruby red "chevron" stripes on each side. The red striping shall be laid over white 3M reflective materials. The reflective decal shall be plainly visible to oncoming traffic when the doors are in the open position.

CAB ACCESSORY FUSE PANEL

A fuse panel shall be located underneath the rear facing seat on the officer's side. The fuse panel shall consist of six (6) battery hot and six (6) ignition switch circuits. Each circuit shall be capable of 10-ampere 12-volt power and total output of 50-amps. The fuse panel shall be capable of powering accessories such as hand held spotlights, radio chargers, hand light chargers and other miscellaneous 12-volt electrical components.

AIR HORNS

Two (2) Grover 2040 Stuttertone rectangular, chrome plated, air horns shall be recess mounted, one (1) each side behind the perforated grille of the bumper. The air horns shall be controlled by a toggle switch wired through the horn button. A foot switch for the air horns shall also be provided on the engineer's side. An air horn button will also be located on the Officer side dash.

BATTERIES

The batteries shall be installed in a vented 304 stainless steel battery box with a removable aluminum cover to protect the batteries from road dirt and moisture. The batteries are to be placed on dri-deck and secured with a fiberglass hold down. The batteries shall be wired directly to starter motor and alternator. Battery cable terminals shall be soldering dipped, color-coded and labeled on heat shrink tubing with a color-coded rubber boot protecting the terminals from corrosion.

There shall be a 350-ampere fuse protecting the pump primer and a 250-ampere fuse protecting the electric cab tilt pump and other options as required.

BATTERY CHARGING

A Kussmaul Auto Charge 1200 battery system charger shall be provided. A single bar graph display is provided to indicate the state of charge of the battery system. The rated output shall be 40 amps for the vehicle battery system.

A Kussmaul Model 091-55-20-120 super electric auto-eject with weatherproof cover and power interrupt shall be provided.

AIR BRAKE SYSTEM

The vehicle shall be equipped with air-operated brakes. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 standards.

Each wheel shall have a separate brake chamber. A dual treadle valve shall split the braking power between the front and rear systems.

All main brake lines shall be color-coded nylon type protected in high temperature rated split plastic loom. The brake hoses from frame to axle shall have spring guards on both ends to prevent wear and crimping as they move with the suspension. All fittings for brake system plumbing shall be brass.

An air dryer shall be provided.

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. The system shall be designed so the vehicle can be moved within 60 seconds of startup. The quick build up 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 60-second buildup time. The vehicle shall not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Four (4) supply tanks shall be provided. One air reservoir shall serve as a wet tank and a minimum of one tank shall be supplied for each the front and rear axles. A Schrader fill valve shall be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake shall be provided on the rear axle. One (1) parking brake control shall be provided and located on the engine hood next to the transmission shifter within easy reach of the driver.

AIR BRAKING ABS SYSTEM

An ABS system shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to axles and all electrical connections shall be environmentally sealed from water and weather and be vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall sense approaching wheel lock and instantly modulate brake pressure up to 5 times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall indicate malfunction to the operator.
The system shall consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip shall hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit shall monitor the speed of each wheel sensor and a microcomputer shall evaluate wheel slip in milliseconds.

ELECTRONIC STABILITY CONTROL SYSTEM

An Electronic Stability Control (ESC) system shall be provided and installed. The ESC system continually monitors the vertical acceleration, and yaw (horizontal plain rotation) of the vehicle, and compares it to a critical threshold where vehicle rollover may occur. When the critical threshold is met, the ESC shall intervene by reducing engine torque and engaging the engine retarder, while automatically applying both the steering and drive axle brakes as needed. In many cases, activation occurs before the driver is even aware it is needed.

BUMPER

There shall be a 12" high double rib polished stainless steel wrap-around bumper provided at the front of the apparatus. Laser cut perforated grilles shall be incorporated into the bumper and located at the outboard section of the bumper for the air horns and at the center for the siren speaker. The bumper shall be mounted to a reinforcement plate constructed of 1/4" x 10" x 70" carbon steel. A gravel shield shall be provided, constructed of .188” aluminum diamond plate. The bumper extension shall be approximately 16".

STORAGE WELL COMPARTMENT

There shall be a hose well compartment located in the center of the front bumper. The compartment shall have an electric booster hose reel mounted and plumbed. Booster reel will accommodate 150’ of 3/4” rubber hose.

COOLING SYSTEM

The cooling system shall be designed to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer’s requirements, and EPA regulations.

RADIATOR

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall be bolted to the bottom of the charge air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

The radiator shall be equipped with a drain cock to drain the coolant for serviceability. The drain cock shall be located at the lowest point of the aluminum cooling system to maximize draining of the system.

CHARGE AIR COOLER

The charge air cooler shall be of a cross-flow design and constructed completely of aluminum with extruded tanks. The charge air cooler shall be bolted to the top of the radiator to allow a single depth core.

COOLANT

The cooling system shall be filled with a 50/50 mix. The coolant makeup shall contain ethylene glycol and de-ionized water to prevent the coolant from freezing to a temperature of –34 degrees F.

HOSES & CLAMPS

Silicone hoses shall be provided for all engine coolant lines.

All radiator hose clamps shall be spring loaded stainless steel constant torque hose clamps for all main hose connections to prevent leaks. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

FAN

The engine cooling system shall incorporate a heavy-duty composite 11- blade Z-series fan. It shall provide the highest cooling efficiently while producing the lowest amount of noise.

A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through again.

The fan tip to radiator core clearance shall be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

FAN CLUTCH

A fan clutch shall be provided that shall allow the cooling fan to operate only when needed. The fan shall remain continuously activated when the truck is placed in pump gear.

SURGE TANK

The cooling system shall be equipped with an aluminum surge tank mounted to the officer's side of the cooling system core. The surge tank shall house a low coolant probe and sight glass to monitor the coolant level. Low coolant shall be alarmed with the check engine light. The surge tank shall be equipped with a dual seal cap that meets the engine manufacturer's pressure requirements, and system design requirements.

The tank shall allow for expansion and to remove entrained air from the system. There shall also be an extended fill neck to prevent system overfill and encroachment of expansion air space. Baffling shall be installed in the tank to prevent agitated coolant from being drawn into the engine cooling system.

ENGINE ENCLOSURE

An integral, formed aluminum and composite engine enclosure shall be provided. The engine enclosure shall be contoured and blended in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure shall be kept as low as possible, to maximize space and increase crew comfort. The enclosure shall be constructed from 5052 H2 aluminum plate and GRP composite materials, providing high strength, low weight, and superior heat and sound deadening qualities. The exterior shall be covered in heavy duty, molded black vinyl, further reducing noise and heat in the cab.

The underside of the engine enclosure shall be covered with a sound deadening, heat reflective insulation system, and shall further minimize noise (DB levels), and eliminate engine heat from the front and rear of the cab. The insulation material shall be bonded with adhesive and mechanically fastened to the underside of the cab. All seams shall be sealed to prevent water absorption. **NO EXCEPTIONS.** A work light shall be installed in the engine enclosure with an individual switch located on the base of the light.

ENGINE

The apparatus shall be powered by a Cummins Diesel ISL 450 HP.

ENGINE WARRANTY

The engine shall have a five year or 100,000 mile warranty and approval by Cummins for installation in the chassis.

EXHAUST

Exhaust shall be located on the Officer's side. Exhaust shall be fitted to accommodate Plymovent exhaust boot.

STARTER

A 12-volt starter shall be provided, controlled by a switch on the left lower cab dash.

AIR CLEANER/INTAKE

The engine air intake and filter shall be designed in accordance with the engine manufacturer's recommendations. It shall be 99.9% effective in removing airborne contaminants when tested per the industry standard SAE J726 procedure and offer a dirt holding capacity of at least 3.0 gm/cfm of fine dust (tested per SAE J726) offering superior engine protection.

The air filter shall be located at the front of the apparatus and shall be at least 66" above the ground, to allow fording deep water in an emergency situation.

An ember separator shall be provided in the engine air intake meeting, the requirements of NFPA 1901.

An Air Restriction warning light shall be provided and located on the cab dash.

ENGINE BRAKE

The engine shall be equipped with a Jacobs compression engine brake. An "On/Off" switch and a control for "Low/High" shall be provided on the instrument panel within easy reach of the driver. The engine brake shall interface with the ABS brake controller to prevent engine brake operations during adverse braking conditions. A pump shift interlock circuit shall be provided to prevent the engine brake from activating during pumping operations. The brake light shall activate when the engine brake is engaged.

FRAME
The chassis frame shall be of a ladder type design utilizing industry accepted engineering best practices. The frame shall be specifically designed for fire apparatus use. A lifetime warranty shall be provided, per manufacturer's written statement.

FUEL TANK
The chassis shall be equipped with at least a 50-gallon stainless steel rectangular fuel tank. The fuel tank shall be certified to meet FMVSS 393.67 tests. It shall also maintain engine manufacturer's recommended expansion room of 5%.
The fuel tank shall be equipped with a 2 1/4" filler neck assembly with a 3/4" vent located on the left hand side of the tank. A fuel fill cap attached with a lanyard shall be provided. The bottom of the fuel tank shall contain a 1/2" drain plug.
The fuel tank shall be mounted in a saddle with a barrier between the tank and the saddle.

CAB HANDRAILS
There shall be four (4) 24" long, handrails provided and installed, one (1) at each cab entrance. The handrails shall be constructed of 1-1/4" diameter, knurled and anodized, 3/8" heavy wall extruded aluminum and mounted utilizing chrome stanchions, which shall provide sufficient space to allow for a gloved hand to grip the rail.
There shall be two (2) rubber coated grab handles provided and mounted on the interior of the cab, one each side, near the windshield post for ingress assistance. The handrail on the driver's side shall be approximately 11" long and the handrail on the officer's side shall be approximately 18" long.

HEATER/DEFROSTER/AIR CONDITIONER
A high performance air conditioning system shall be furnished inside the cab and crew cab. The air conditioning system shall perform as follows: In 100 degree Fahrenheit ambient temperature with 50 percent relative humidity and at maximum compressor speed, the cab and crew cab shall cool down to 75 degrees Fahrenheit within 30 minutes. Actual test results of the air conditioning system, verifying this performance requirement, shall be submitted at delivery. A combination condenser/evaporator with a BTU rating sufficient to meet the performance specification shall be installed on the cab roof.

LOAD MANAGER An electronic load management (ELM) system shall be provided that monitors the vehicles 12-volt electrical system and automatically reduces the electrical load in the event of a low voltage condition. By doing so, this ensures the integrity of the electrical system. The ELM shall monitor the vehicle's voltage while at the scene (parking brake applied). It shall sequentially shut down individual electrical loads when the system voltage drops below a preset value. The ELM shall sequentially re-energize electrical loads as the system voltage recovers

AUTOMATIC HIGH IDLE ACTIVATION

The load management system shall be capable of activating the apparatus high idle system when the system voltage drops below a pre set value. 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 PTO engagement.

MASTER BATTERY & IGNITION SWITCH

The vehicle shall be equipped with a keyless ignition, with a two (2)-position Master Battery rocker switch, "Ignition Off/On" and a two (2)-position Engine Start rocker switch, "Off/Start".

WIRING

All wiring shall have XL high temperature crosslink insulation and shall be 10 gauge, 12 gauge, 14 gauge and 18 gauge depending on load. All wiring shall be color-coded, and the function and number stamped at 3" intervals on each wire. All wiring shall be covered with high temperature rated split loom for easy access to wires when trouble shooting. All electrical connectors and main connectors throughout the chassis shall be treated to prevent corrosion.

DOOR AJAR INDICATION

Red LED lights are provided in the forward cab overhead console area, visible to both driver and officer. Upon releasing the apparatus parking brake these lights shall automatically illuminate (flash) if any cab door is open, compartment door is open, any ladder or equipment rack is not in stowed position, stabilizer system deployed or any other device has not been properly stowed that may cause damage if the apparatus is moved.

PUMP SHIFT MODULE

A pump shift module with indicating lights shall be located within easy reach of the driver. A gear lockup shall be provided to hold the transmission in direct drive for pump operation.

HIGH IDLE

The engine shall have a "high idle" switch on the dash that shall maintain an engine RPM of 1,000.The switch shall be installed at the cab instrument panel for activation/deactivation. The "high idle" mode shall become operational only when the parking brake is on and the truck transmission is in neutral.

VEHICLE DATA RECORDER

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 shall be installed. Vehicle data shall be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.
Software shall be provided to allow the fire department to collect the data as needed.

INTERIOR

The cab interior shall be finished in gray Durawear on the full front and rear headliners and rear firewall.

LIGHTING CAB EXTERIOR

Exterior lighting and reflectors shall meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at this time.

HALOGEN HEADLIGHTS

There shall be dual sealed beam halogen rectangular headlights in custom housings on each side of the front of the cab.

LIGHTING CAB INTERIOR

Interior lighting shall be provided inside the cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. One light shall be located over each the officer and driver's position. The lights shall also activate from the open door switch located in each cab doorjamb.

LIGHTING CREW CAB INTERIOR

Interior lighting shall be provided inside the crew cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided. The lights shall also activate from the open door switch located in each cab doorjamb.

MIRRORS

Mirrors will be heated 4 way power adjustable.

HELMET STORAGE

A universal style helmet bracket shall be provided for each riding position.
A placard shall be provided for each riding position warning that injury may occur if helmets are worn while seated.

SEAT BELT WARNING SYSTEM

A seat belt warning system shall be provided, and shall monitor each seating position. Each seat shall be supplied with a sensor that, in conjunction with the display module located on the dash, shall determine when the seat belt was fastened and if the seat is occupied. An icon shall represent that the seat is properly occupied.
An audible and visual alarm shall be activated if the seat is occupied and/or the belt is not fastened in the proper sequence.

DRIVER'S SEAT

The driver's seat shall be a Bostrom air ride high back, adjustable fore/aft, upholstered with gray tweed Durawear. A 3-point seat belt shall be provided.

OFFICER'S SEAT

The officer's seat shall be a Bostrom FirefighterTM Tanker 450 ABTS SCBA seat. The seat shall have the following features:

- Integrated 3-point seat belt
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% DurawearTM gray tweed seat material

UNDER SEAT STORAGE

There shall be a storage compartment under the officer's seat approximately 15" wide x 10.5" tall x 15.5" deep.

CREW SEATS

The crew cab area shall have four (4) Bostrom FirefighterTM seats. The seating arrangement shall be: two (2) rear facing Bostrom Tanker 450 ABTS SCBA seats and two (2) forward facing Bostrom Tanker 450 ABTS SCBA seats. The seats shall have the following features:

- Integrated 3-point seat belts
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% DurawearTM gray tweed seat material
  A removable upholstered pad shall be provided to cover the crew seat SCBA cavities.

SCBA BOTTLE BRACKET

The officer and crew seats shall come equipped with an H.O. Bostrom SecureAllTM SCBA Locking System capable of securing all U.S. and international SCBA brands and sizes while in transit or for storage on fire trucks. Locking shall be achieved by pushing the SCBA unit (bottle) against the pivot arm to engage the automatic lock system. A top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The bracket shall be equipped with a center guide fork to keep the tank in-place for a safe and comfortable fit in seat cavity.

All adjustment points shall utilize one tool and be easily adjustable.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units.

The release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The bracket system shall meet NFPA 1901 standards and requirements of EN 1846-2.

FRONT HUB COVERS

Polished stainless steel hub covers shall be provided for the front axle.

REAR HUB COVERS

Polished stainless steel hub covers shall be provided for the rear axle.

MUD FLAPS

Hard rubber mud flaps shall be provided for front and rear tires.

TOW EYES (Front)

There shall be two front tow eyes with 3" diameter holes attached directly to the chassis frame.

TOW EYES (Rear)

There shall be two tow eyes attached directly to the chassis frame rail and shall be chromate acid etched for superior corrosion resistance and painted to match the chassis.

TRANSMISSION

The chassis shall be equipped with a Generation IV Allison EVS3000 six (6) speed automatic transmission. It shall be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine. An electronic oil level indicator shall be provided as well as a diagnostic reader port connection. The fifth gear shall be an overdrive ratio, permitting the vehicle to reach its top speed at the engine's governed speed. The dipstick shall be dipped in a rubber coating for ease in checking oil level when hot.

TRANSMISSION SHIFTER

An Allison "Touch Pad" shift selector shall be mounted to the right of the driver on the engine cover accessible to the driver. The shift position indicator shall be indirectly lit for nighttime operation.

WINDSHIELD WIPERS

Two (2) black anodized finish two speed synchronized electric windshield wiper system. Dual motors with positive parking. System includes large dual arm wipers with built in washer system. One (1) master control works the wiper, washer and intermittent wipe features. Washer bottle is a remote fill with a 4 quart capacity. Washer fill is located just inside of officer cab door.

MISCELLANEOUS CHASSIS EQUIPMENT

Fluid capacity plate affixed below driver's seat.

Chassis filter part number plate affixed below driver's seat. Maximum rated tire speed plaque near driver.

Tire pressure label near each wheel location.

Cab occupancy capacity label affixed next to transmission shifter. Do not wear helmet while riding plaque for each seating position. NFPA compliant seat belt and standing warning plates provided.

PUMP PANEL

Pump Panel will be of a **Top Mount** pump panel design.

FIRE PUMP

The fire pump shall be a two stage centrifugal type, carefully designed in accordance with good modern practice.

All moving parts in contact with water shall be of high quality bronze or stainless steel. Discharge passage shall be designed to accomplish uniform pressure readings as the actual pump pressure. The rated capacity of the fire pump shall be 1500 gallons per minute in accordance with NFPA# 1901.

HEAT SHIELD

A heat shield shall be installed on the under side of the pump.

PUMP TRANSFER CASE

The drive unit shall be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. Pump drive unit shall be of sufficient size to withstand up to 16,000 lbs. ft. torque of the engine in both road and pump operating conditions.

The gearbox drive shafts shall be heat treated chrome nickel steel. Input and output shafts shall be at least 2-3/4" in diameter. They shall withstand the full torque of the engine in both road and pump operating conditions.

The engagement of the pump transmission shall be of such design so as to permit transfer of power from road to pump operation only after vehicle is completely stopped.

PRIMING SYSTEM

The priming pump shall be a Trident, venturi based AirPrime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control shall activate the priming pump and open the priming valve to the pump.

PUMP CERTIFICATION

The pump, when dry, shall be capable of taking suction and discharging water in compliance with NFPA #1901 chapter 14. The pump shall be tested by National Testing and shall deliver the percentages of rated capacities at pressures indicated: 100% of rated capacity @ 150 PSI net pump pressure. 70% of rated capacity @ 200 PSI net pump pressure. 50% of rated capacity @ 250 PSI net pump pressure.

THREAD TERMINATION

National Standard Thread shall terminate the inlets and outlets of the apparatus.

PRESSURE GOVERNOR

Apparatus shall be equipped with a Class1 Pressure Governor that is connected to the Electronic Control Module (ECM) mounted on the engine. The Governor shall operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's data for optimal resolution and response.

Programmable presets for RPM and Pressure settings shall be easily configurable using the menu structure.

Engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all shall be provided.

INTAKE RELIEF

There shall be a Hale stainless steel intake relief valve installed on the intake side of the pump. The surplus water shall be discharged away from the pump operator and terminate with Male NST hose thread. System shall be field adjustable.

AUXILIARY COOLER

An auxiliary cooler shall be furnished to provide additional cooling to the engine under extreme pumping conditions. Water from the pump is to be piped to the coils of the heat exchanger allowing the engine fluid to be cooled as required.

AUXILIARY PUMP HEATER

An auxiliary heater for the pump will be installed.

VALVES

All valves shall be Akron Heavy-Duty swing out 8800/8600 series unless otherwise noted. The valve shall have an all cast brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be compatible with a slow close device. This

valve shall be actuated using manual handles, a Rack & Sector, manual gear, or electric actuator. The manual handles shall be quickly adjustable to one of eight handle positions, and require only 90 degrees travel.

VALVE WARRANTY

The valves shall carry a 10-year warranty.

PUMP CONNECTIONS

All suction and discharge lines (except pump manifolds) 1" and larger shall be heavy- duty stainless steel pipe. Where vibration or chassis flexing may damage or loosen piping or where a coupling is necessary for servicing, a flexible connection shall be furnished. All lines shall be drained by a master drain valve or a separate drain provided at the connection. All individual drain lines for discharges shall be extended with a rubber hose in order to drain below the chassis frame. All water carrying gauge lines shall utilize nylon tubing.

6” PUMP INLETS

Two 6" diameter suction ports with 6” NST male threads shall be provided, one on each side of vehicle. The inlets shall extend through the side pump panels and come complete with removable strainer and long handle chrome-plated cap.

INTAKE VALVE

A Hale Master Intake valve shall be installed on the main pump inlet on engineer's side. It shall be electrically actuated from the pump panel and include a manual override hand wheel on the pump panel. The valve shall include a pressure relief valve to guard against incoming pressure surges.

2.5" RIGHT SIDE INLET

One 2.5" gated inlet valve shall be provided on the right side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer.

The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

2.5" LEFT SIDE INLET

One 2.5" gated inlet valve shall be provided on the left side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer.

The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

OUTLETS

The discharge valves shall be constructed of stainless steel. The valves shall be controlled from the operator's panel and shall be equipped with locking handles. Each valve shall be supplied with 2-1/2” National Standard Threads and come with chrome plated female caps and chains. 2-1/2" or larger discharge outlet shall be supplied with a 3/4" quarter turn drain valve located at the outlet. All 2-1/2" and larger discharges shall be supplied with a 30 degree angle down elbow.

2-1/2” OFFICER SIDE DISCHARGE

One (1) 2-1/2” gated discharge shall be located on the Officer side pump panel. The valve shall be connected to the discharge side of the pump with the valve bodies behind the pump panel. A chrome swing type handle located on the pump operator’s panel shall control the side discharges.

2-1/2” ENGINEER SIDE DISCHARGES

Two (2) 2-1/2” gated discharges shall be located on the Engineer side pump panel. Each valve shall be connected to the discharge side of the pump with the valve bodies behind the pump panel. Chrome swing type handles located on the pump operator’s panel shall control the right side discharges.

2.5" OUTLET LEFT REAR

There shall be a 2.5" gated outlet piped to the left rear, adjacent to the hose bed. The outlet shall be installed with proper clearance for spanner wrenches or adapters. Plumbing shall be 2.5" piping and a full flow 2.5" ball valve with the control at the pump operator's panel.

2.5" RIGHT REAR OUTLET

There shall be a 2.5" gated outlet piped to the right rear, adjacent to the hose bed. The outlet shall be installed with proper clearance for spanner wrenches or adapters. Plumbing shall be 2.5" piping and a full flow 2.5" ball valve with the control at the pump operator's panel.

2.5" PRECONNECT OUTLET ENGINEER SIDE HOSE BED

There shall be a 2.5" gated outlet piped to the engineer side front of the hose bed. Plumbing shall be 2.5" piping and a full flow 2.5" ball valve with the control at the pump operator's panel. Will accommodate 150’ of 3” hose with blitz nozzle attached. BlitzFire nozzle will be mounted to the rear of the hose bed.

4” Officer Side Discharge

There shall be a 4" large diameter discharge, with 4" plumbing, located on the officer side pump panel.

An Akron Brass model 8630 3" Swing-OutTM valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a ten (10) year warranty by the valve manufacturer. The discharge shall terminate MNST thread.

There shall be one (1) Kochek model SKE54R, 4" Female NH swivel rocker lug x 5" Storz 30degree elbow adapter provided. The adapter shall be light weight aluminum with a black K-Coat finish.

There shall be one (1) Kochek model CC507, 5" Storz blind cap with chain provided. The cap shall have a K-Coat finish.

FRONT BUMPER DISCHARGE

A discharge will be placed to accommodate a booster reel of 3/4” rubber hose.

DELUGE RISER

A 3" deluge riser shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping shall be rigidly braced. The riser shall be gated and controlled from the pump operators panel.

MONITOR NOZZLE

An Akron Model #3479 electric monitor shall be provided complete with Akromatic Model 5058 nozzle. The monitor shall have controls at the pump panel area.

The monitor shall be capable of flowing 1000 gpm, as well as capable of the following functions separately or simultaneously;

1. 90 degree horizontal sweep.
2. 120 degree vertical sweep.
3. Change water spray pattern from fog to straight stream

EXTEND-A-GUN

A Task Force Tips Extend-A-Gun model XG18 shall be provided and installed. The unit shall allow the deck gun monitor to extend 18”.

CROSSLAYS

Two (2) crosslay hose beds shall be supplied. The piping and valves shall be 2", the swivel shall be 1.5". Each compartment shall hold 200 ft. of 1.75" double jacket hose. Both beds shall be of the same dimension.

CROSSLAY COVER

The crosslays shall be fitted with an aluminum cover. The cover shall have a stainless steel hinge and flaps on the sides capable of being securely fastened.

TANK FILL

A 2" tank fill line shall be provided, using a quarter turn full flow ball valve controlled from the pump operator's panel.

FOAM TANK

There shall be a 20-gallon foam tank. The tank shall be part of the main booster tank. There shall be a 3" PVC fill tower and cap and a tank vent. There shall be a 1-1/2" flanged outlet and drain valve at the lowest point in the tank.

FOAM SYSTEM

The apparatus shall be equipped with a FoamPro 2001 electric, fully automatic, variable speed, discharge side foam proportioning system. The system shall be capable of handling class A and most types of class B foam. (Micro-Blaze Out, Chem Guard 1%) The system shall be equipped with a 12-volt electric motor driven positive displacement foam concentrate pump, rated up to 2.6 gpm, with operating pressures up to 400 psi.

A digital computer control display shall be provided and display shall include the following functions:

- - Push-button control of foam proportioning foam
- - Current flow-per-minute of water
- - Volume of water discharged
- - Flow rate simulation
- - Set-up and diagnostic functions
- - "Low Concentrate" warning light
- - "No Concentrate" warning light

The foam shall be plumbed to all 1-3/4" crosslays.

VALVE CONTROLS
The pump controls and gauges shall be located on the top mount pump panel. All valve controls shall have the corresponding discharge gauge located immediately adjacent to control handle to allow operator to view the discharge pressure without searching the panel.

ESCUTCHEON PLATES
The pump panel shall be equipped with color-coded removable escutcheon plates around the suction and discharge valves.

COLOR CODING/IDENTIFICATION
Each discharge valve control, outlet, and corresponding line gauge shall be color- coded. (Labeling of all valves will be discussed at pre build meeting)

PUMP PANEL LIGHTS
The pump panel controls and gauges shall be illuminated by a minimum of two (2) incandescent lights.

PUMP PANEL GAUGES AND CONTROLS
The following gauges and controls shall be provided at the pump panel:

- Two (2) certified laboratory test gauge outlets.
- Pump primer control.
- Master drain control and additional drains as needed.
- Tank-fill and pump cooler valve controls.
- Tank to pump valve control.
- Pump capacity rating plate.
- All discharge controls.
- Two (2) master pump gauges.
- Gauges on all 1-1/2" and larger discharge lines.
- Air Horn Activation Button
- Scene Light Activation Buttons

4” MASTER GAUGES
The gauges shall be 4" in diameter with white faces and black lettering. The gauges shall have a pressure range of 0-400 psi.

2.5" PRESSURE GAUGES
The gauges shall be 2.5" in diameter with white faces and black lettering. The gauges shall have a pressure range of 0-400 psi.

WATER TANK GAUGE
LED Water tank gauge will be placed on the pump panel. A second LED water tank gauge will be placed in the Cab where it is visible to the Engineer and Officer.

CLASS A FOAM TANK LEVEL GAUGE
A Fire Research TankVision® model WL2600 foam tank volume indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and sensor cable. The indicator shall show the volume of Class A foam in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof and manufactured of aluminum.
The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a

datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 25%, down chasing LEDs when the tank is almost empty.
The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted on the outside of the water tank near the bottom; no probe shall be place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.
The gauge shall be located on the pump operator's panel.

ELECTRIC CORD REELS

There shall be two (2) electric rewind cord reels installed on the apparatus. One (1) on the Officer side and one (1) on the engineer side. The cord reels will each be equipped with 200' of yellow STW Seoprene 10/3 wire installed with a cable stop.

JUNCTION BOX

There shall be an Akron Brass Extenda-Lite back lighted electrical junction box equipped with four (4) receptacles, two (2) per side. Two (2) 20A 125V Twist Lock receptacles and Two (2) 20A 125V Straight Blade receptacles. The cord reels shall be pre wired to the cast aluminum junction box to supply power to the receptacles. An extension cord shall be connected to the junction box through a heavy duty water resistant strain relief and flexible extender.

GENERATOR

A 10kw hydraulic generator will be installed on the apparatus. Generator will be capable of operating with engine at idle.

BODY SUB-FRAME

The chassis shall be fitted with a sub-frame system consisting of a series of steel plate gusseted legs, extending down and out from the chassis frame rails on each side. This system shall provide additional structural support to the running boards and side compartments. A heavy-duty rear platform shall be constructed of the same material to support the rear compartments and rear step. The entire assembly shall be attached to the chassis frame by a series of heavy-duty U-bolts. Self-supporting bodies shall not be acceptable. **NO EXCEPTIONS**
The entire sub frame assembly shall be painted to match the chassis frame color.

APPARATUS BODY

The body shall be constructed of aluminum sheet, bright aluminum diamond plate and structural aluminum extrusions. The body shall be of the modular design to allow for proper flexing of the truck chassis. The body shall be custom built and engineered for proper load distribution on the chassis. An insulator material shall be used where aluminum and steel are in contact to prevent corrosion.
The ceilings, sidewalls and floors of the body compartments shall be constructed of 3/16" smooth aluminum plate
The body framework shall be constructed of aluminum alloy with a tensile strength of at least 35,000 psi.
To eliminate "dead space" and to maximize compartment interior space, there shall be no more than 1/4" between outer and inner walls.
Each compartment shall be properly vented with louvers.

COMPARTMENTATION
Compartments will be designed to allow for the maximum amount of storage possible. There will be a minimum of at least 7 compartments on the body.

COMPARTMENT DOORS
Compartment doors should be roll up style doors.
A door open indicator light shall be provided in the cab.

SCBA CYLINDER COMPARTMENTS
There shall be **at least** six (6) spare breathing air cylinder compartments recessed in the rear fender wells, three (3) left and three (3) right. The compartments shall have brushed stainless doors equipped with a weather resistant flush fitting thumb latch. The interior of the door shall incorporate a rubber seal to keep the compartment free of road debris and moisture. The interior compartment shall be constructed of a high-density polyethylene plastic. (Any additional spare cylinder compartments will be discussed at pre-construction)

ADJUSTABLE SHELVES
There shall be at least six (6) adjustable shelves mounted in the compartments. (Exact compartments and location to be determined at preconstruction)

COMPARTMENT SLIDE OUT TRAY
There shall be at least three (3) slide out trays installed in compartments. (Exact compartment location to be determined at preconstruction)

HOSE BED
The hose bed shall be provided with aluminum slatted flooring radiused at the edges to prevent hose damage from sharp edges. Each hose bed floor section shall be removable for easy access to the water tank.
Hose layout from engineer's side to officer's side:
150' of 3" – preconnect flat load, single stack BlitzFire
200' of 3" - single stack/flat load attack line
1000' of 5.00" – flat load
400' of 3.00" – flat load
400’ of 3.00” – flat load

HOSE BED DIVIDER
The hose bed shall be divided by four (4) 3/16" aluminum partitions that are fully adjustable by sliding in tracks located at the front and rear of the hose bed. The dividers shall be located as directed at the pre-construction meeting.

HOSE BED COVER
Heavy Duty vinyl/nylon hose bed cover will be provided and installed.

BOOSTER TANK
The tank shall have a capacity of at least 750 U.S. gallons.
The tank shall be constructed of 1/2" thick polypropylene sheet stock. This material shall be a non-corrosive stress relieved copolymer thermo-plastic and U.V. stabilized for maximum protection. The booster tank shall be of a specific configuration and is so designed to be completely independent of the body and

compartments. All joints and seams shall be welded and/or formed and tested for maximum strength and integrity.

BOOSTER REEL AND EQUIPMENT

One (1) bright aluminum electric rewind compact/narrow style booster reel with sealed joints, leak proof ball bearings, and an adjustable friction brake. The reel shall have a heavy frame to keep the drum, bearings, and rewind mechanism in alignment at all times. The reel shall have roller guides to prevent hose damage while it is being taken on and off of the reel. The electric rewind shall be located for convenience and safety of operation. Positive rewind power shall be assured by the use of sprocket and chain in conjunction with a geared manual crank.
The reel shall be located in the front bumper area, and shall be equipped with 150 ft. of 3/4" best grade booster hose and a 30 gpm nozzle. Booster Reel retract button located at the booster reel(exact position determined at preconstruction).

ELECTRIC SYSTEM

All electrical wiring in the chassis shall be XLP cross link-insulated type. Wiring is to be color-coded and include function codes every three (3) inches. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers contain automatic thermal self-resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays are utilized in circuits which amp loads are substantially lower than the respective component rating thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease in custom construction. The power distribution centers shall be function oriented. The first is to control major truck function and the second controls overhead switching and interior operations. Each module shall be single function coded and labeled to aid in troubleshooting. The centers also have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.
All external harness interfaces shall be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points shall be mounted in accessible locations. Complete chassis wiring schematics shall be supplied with the apparatus.
The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. The wiring shall be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).
All harnesses shall be covered with moisture resistant loom with a minimum rating of 300 Degrees Fahrenheit and a flammability rating of VW-1 as defined in

UL62. The covering of jacketed cable has a minimum rating of 289 degree Fahrenheit.
All harnesses are securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations use a method that provides a positive mechanical and electrical connection and are in accordance to the device manufacturers instructions. No connections within the harness shall utilize wire nut, insulation displacement, or insulation piercing components.
All circuits conform to SAE1292. All circuits are provided with low voltage over current protective devices. These devices are readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers are not used for ground connections.

BACK-UP ALARM

An automatic self-adjusting electronic back-up alarm producing 87- 112 db shall be installed at the rear between the frame rails. It shall operate whenever the transmission's reverse gear is selected.

COMMUNICATION SYSTEM

A six(6) position FireCom system shall be provided in the cab. The six positions include: engineer, officer and four crew seats. The engineer and officer positions shall be interfaced with radio and will feature PTT. Officer and Engineer will be wireless headsets. The four crew seats will be hard wired headsets.

COMPARTMENT LIGHTING

Each compartment shall be equipped with at least two (2) LED light strips which shall provide a consistent pattern to illuminate the entire compartment.

LED ICC/MARKER LIGHTS

LED type ICC/marker lights shall be provided to meet D.O.T. requirements.

GROUND LIGHTING

The apparatus shall be equipped with lighting capable of illumination to meet NFPA requirements. Lighting shall be provided at areas under the driver and crew riding area exits and shall be automatically activated when the exit doors are opened. Lighting required in other areas such as work areas, steps and walkways shall be activated when the parking brake is applied, provided the ICC lights are on.

UPPER LEVEL WARNING DEVICES

The upper level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:
Zone A (front) shall have one (1) NFPA 1901 compliant light bar, with at least eight (8) LED modules. The light bar shall have red, white and blue LED heads and shall be mounted on the cab roof.
There shall be two brow lights mounted on the front cab. One (1) on Officer side and one (1) on Engineer side.
Zone B (right side) shall be covered by light bar and beacon.
Zone C (rear) shall have rear LED beacons, one (1) red and one (1) blue. Deflectors shall be mounted on forward side to prevent flash in mirrors.
Zone D (left side) shall be covered by light bar and beacon.

ARROWSTICK
An arrow stick will be installed on the rear of the apparatus above the roll up compartment door. The control head will be located in the cab and easily accessible for the engineer.

BROW MOUNT 12V LIGHTS
There shall be two (2) Extenda-Lite/Akron Brass scene lights with brow mount bracket installed on the apparatus. The mounting brackets shall attach to the bottom of the lighthead and be machined to conform to the roof radius. All brackets shall be heavy duty, cast aluminum that are powder painted white to match the light head. The light head shall contain 8 high power LEDs.
There shall be two (2) remote switches installed: one (1) on the pump panel and one (1) in the cab chassis.
The lights shall be mounted over the officer and engineer side of the chassis.

LOWER LEVEL WARNING DEVICES
The lower level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:
Zone A (front) shall have a stainless steel warning light housing on each side with two (2) Whelen 600/or similar Super LED red lights mounted in the front of each housing. The inboard pair of lights is in addition to the minimum NFPA warning system and shall be wired through a load-shedding device.
Zone B (right side) shall have at least three (3) Whelen 600 Series/ or similar Super LED lights mounted; one (1) red on the side of the front bumber extension, one (1) blue on side of crew cab and one (1) red over rear wheel well.
Zone C (rear) shall have two (2) Whelen 600 Series/ or similar Super LED lights mounted one each side of the rear of the apparatus. Lights will be red and blue.
Zone D (left side) shall have at least three (3) Whelen 600 Series/ or similar Super LED lights mounted; one (1) red on the side of the front bumber extension, one (1) blue on side of crew cab and one (1) red over rear wheel well.

SIREN
One (1) electronic siren shall be installed at the cab instrument panel complete with noise canceling microphone. The control on the siren head shall actuate the siren.

SIREN SPEAKER
One weatherproof siren speaker shall be provided and mounted behind the bumper. Speaker shall be a 200 watt speaker.

FEDERAL Q2B SIREN
There shall be a Federal Q2B siren installed on the engineer side of the bumper. The siren shall be securely mounted and activated by means of a solenoid and shall include a brake.
A siren foot switch shall be provided for both the driver and officer, one on each side of the cab floor.

GROUND LADDERS

The apparatus shall be equipped with heavy duty, box type "I" beam rail, ground ladders. The ladders shall meet the requirements of NFPA 1931 to ensure proper design and that sufficient strength is available for the service intended. The ground ladders shall be constructed of aluminum with non-welded, field replaceable rung to rail connections to simplify field repairs and removable plated steel butt spurs for added strength. A full 1/2", non-rotting, poly rope shall be provided for easy ladder operation.

One (1) Alco-Lite PEL-24 24 ft. two-section aluminum extension ladder.

One (1) Alco-Lite PRL-14 14 ft. aluminum roof ladder.

One (1) Alco-Lite FL-10' 10 ft. folding ladder.

The ladders shall have lifetime Warranty against manufacturing defects.

LADDER MOUNTING

The ladders shall be mounted on a hydraulic ladder mount on the officer side. Mount will have ability to store two (2) pike poles as well.

CORROSION REDUCTION POLICY

The manufacturer shall have in place a formal corrosion reduction program and assembly procedures designed for reducing and eliminating the possibility of corrosion. It is understood that fire apparatus shall operate in harsh environments. At the time of the bid the apparatus manufacturer shall show proof of a corrosion policy. Failure to submit this information could be grounds for rejection. If a formal policy is not in place explain in your bid how your firm shall take the necessary steps for corrosion reduction. There shall be no exception to this requirement.

PAINT-TWO TONE CAB

The cab exterior surfaces shall be two (2) colors. The paint break line shall be at the bottom of the windshield.

Top: White Bottom: Red

LETTERING

Lettering of the Engine will be provided. Details to style, size etc. to be determined at pre construction meeting.

STRIPING

A 6" Scotchlite stripe (white) shall be provided across the front of the cab and along each side of the apparatus.

An additional 1" Scotchlite stripe (white) shall be provided above and below the 6" stripe.

STRIPING, CHEVRON STYLE, REAR BODY, OUTBOARD

The apparatus shall have 6" red and yellow reflective Chevron style striping affixed to the outboard right and left portion of the rear body. The striping shall be set in a manner to have the effect of an inverted "V" shape. The stripe shall travel low to high from the outside to the inside.

RADIO INSTALATION

Fire Department will provide all radio equipment to be installed in the cab of the vehicle. Chassis manufacturer will install radio antenna.

MISCELLANEOUS EQUIPMENT FURNISHED

1 pt. touch-up paint
Four (4) Streamlight E-Spot Fire Box with vehicle mount will be installed in the crew cab (location to be determined at preconstruction)
Five (5) Drager PSS 7000 SCBAs with 30 minute cylinders to be placed in all apparatus seats with SCBA brackets.
Five (5) Drager 30 minute spare SCBA cylinders
One (1) ISG INFRASYS EliteXR Thermal Imaging Camera with vehicle mount and charging station will be installed in the crew compartment.
400' 1 ¾" Mercedes Kraken EXO hose
2000' 5" Mercedes Mega Flo Breather hose
1200' 3" Mercedes Kraken EXO hose
Two (2) TFT Flip Tip Nozzle model FTGF34F1F
One (1) TFT BlitzFire mounting bracket to be installed on rear of apparatus.

WHEEL CHOCKS

Two (2) Ziamatic #SAC-44 folding wheel chocks with SQCH-44H holders shall be provided. The wheel chocks shall be located in an area close to the rear axles easily accessible from the side of the apparatus.

OPERATION AND SERVICE MANUALS

Complete "Operation and Service" manuals shall be supplied with the completed apparatus, one (1) printed copy and one (1) CD. Service manual instructions shall include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer shall supply part numbers for major components (i.e. Engine, Axles, Transmission, Pump, etc.). A table of contents, hydraulic, air brake and overall apparatus wiring schematics shall be included.
A video demonstration DVD on the operation of the truck shall be supplied with the manuals.

WARRANTIES

The following warranties shall be supplied:

1. The apparatus shall be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus shall be covered for parts and labor costs associated with repairs for a period one (1) year.
2. Lifetime warranty on the frame.
3. Seven (7) year warranty on paint.
4. Ten (10) year body structural warranty
5. Ten (10) year cab structural warranty
6. Manufacturers Warranties for all major components.
7. Lifetime warranty on booster tank

DELIVERY

The custom built fire apparatus shall be driven from the manufacturing facility to Scottsbluff, Nebraska by a factory trained delivery engineer who shall thoroughly demonstrate the complete apparatus operation and maintenance to the fire department designated personnel.

MANUFACTURING & LOCATIONS

The apparatus shall be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, and service shall be provided on a 24 hours around the clock basis. The company shall maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.