

Town of Berwick, Maine

Request for Bids

Two Rescue Style Pumper Apparatus

Bids Due: 12/15/2016 at/before 04:00 PM

Contact:

TownManager@BerwickMaine.org

OR

Town hall

Town of Berwick

Attn: Town Clerk

11 Sullivan Street

Berwick, ME 03901

**Town of Berwick Maine Request for Sealed Bids
Two Rescue Style Pumper Trucks**

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1 Section-1 General

2 Intent

3 Bids are requested for two custom fire pumping apparatus, with five person, full-tilt cabs. The
4 apparatus shall meet the requirements of National Fire Protection Association (NFPA) 1901,
5 Standard for Automotive Fire Apparatus (Current Edition), in all respects for use as a Class-A
6 pumper fire apparatus with the exception of the section dealing with "Equipment
7 Recommended for Various Types of Apparatus". Bidders shall provide the equipment requested
8 herein and the buyer shall supply the rest before the apparatus is put into service. There are to
9 be no exceptions to this requirement.

10 Some items in the specifications exceed NFPA standards and will be considered minimum for
11 compliance.

12 Items not described in this specification for construction or performance, or in NFPA 1901
13 (2009 edition), may be accepted as the standard of the bidder who shall be solely responsible
14 for the design, construction, and performance of apparatus and equipment.

15 The unit shall comply with all Federal, State, I.C.C., and D.O.T regulations, standards, and laws
16 relating to commercial vehicles as well as to fire apparatus. The unit shall be able to pass a
17 Maine state motor vehicle inspection for commercial vehicles.

18 Any error, omission, or inconsistency that is identified by the bidder shall be listed as such in
19 the exceptions, and a proposal to meet the intent of the specifications shall be listed.

20 The bid price must remain valid for a period of sixty days from the date of bid opening.

21 Submission Requirements

22 All responses to this invitation and request must be in a sealed envelope(s) and shall be
23 submitted to the Town of Berwick by 4:00 p.m. on Thursday December 15, 2016. Responses
24 may be mailed or hand delivered to the Town Clerk's Office, and shall be clearly and boldly
25 marked as follows:

26 "Fire Engine Bid"

27 Responses shall be addressed as follows:

28 TOWN HALL

29 TOWN OF BERWICK

30 ATTN: TOWN CLERK

31 11 SULLVAN STREET

32 BERWICK, ME 03901

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1 Late bids shall not be accepted under any circumstances.

2 **Inquiries**

3 Questions regarding the enclosed specifications shall be directed to the same address and
4 attention listed above, or alternately sent by email to townmanager@berwickmaine.org. All
5 responses shall be furnished in writing and shared with any interested respondent of record at
6 the time distributed.

7 **Bid Opening**

8 Bids will be unsealed on Thursday, December 15, 2016, 4pm in the Town Office Conference
9 Room. Bids be presented to the Board of Selectmen at their next meeting, at which time they
10 may act upon the bids, or alternately may take them under consideration for action at a
11 subsequent meeting.

12 **The Right to Reject Bids**

13 The Town of Berwick reserves the right to reject any and all bids received and accept any bid
14 that, in its judgment, best serves the interest of the Town.

15 **Bid Bond**

16 A bid bond or certified check in the amount of ten percent (10%) of the bid shall be furnished
17 with the bidder's proposal. The bond will ensure that the bidder will enter into contract and
18 submit a performance bond within thirty days of notice of award of contract. The successful
19 bidder's bid bond will be returned or released after a contract is executed and an acceptable
20 performance bond has been delivered. In case of failure to comply within the stated time, the
21 bid bond will be forfeited as liquidated damages because of the default.

22 The bid bonds or checks of all other bidders will be returned after bids are opened and
23 evaluated.

24 **Apparatus Delivery Tests**

25 The road and pump tests required are those specified in NFPA 1901, and this specification, and
26 shall be conducted by the bidder at time of delivery to the purchaser in the presence of the
27 accepting authority.

28 In the event the apparatus fails to meet the test requirements on the first trials, second trials
29 may be made at the option of the bidder within thirty (30) days of the date of the first trials.

30 Such trials shall be final and conclusive, and failure to comply with these requirements a second
31 time shall be cause for rejection.

32 Permission to keep or store the apparatus in any building owned or occupied by the purchaser
33 during the above specified period, with the permission of the bidder, shall not constitute

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1 acceptance. Insurance covering loss, theft, or liability shall remain the responsibility of the
2 bidder until formal acceptance is completed.

3 **Acceptance**

4 Acceptance of the delivered apparatus and equipment will be made at completion of all
5 required tests, inspections, and receipt of all specified equipment. Equipment items not
6 delivered at time of the tests, construction not in conformance with the proposal, or vehicle or
7 systems performance not in conformance with the proposal will be cause for the Department
8 to withhold payment until delivery is complete and acceptable.

9 The finished apparatus will be inspected upon delivery for compliance with specifications,
10 change orders, and previously authorized exceptions. Deviations will not be tolerated and will
11 be cause for rejection of apparatus unless they were originally listed in the bidder's proposal or
12 previously approved.

13 Liquidated damages in the amount of \$200 per calendar day, beginning the day after declared
14 delivery date, shall be deducted from the final payment until the apparatus is considered
15 acceptable.

16 If, after 30 days, the apparatus is not brought up to compliance, the bidder may be considered
17 in default of the contract, the vehicle may be rejected, and the procedures to institute the
18 provisions of the performance bond may be started.

19 **Construction Material**

20 It is the intent of the Berwick Fire Department to accept an apparatus of aluminum or stainless-
21 steel body and cab construction only.

22 All portions of the body, sub-frame, mounting supports, pump mounts, etc. will be constructed
23 of stainless-steel, aluminum, or galvanized steel.

24 Any portion that is to be galvanized steel will be galvanized after all cutting, machining, and
25 welding has been completed, and the part is ready for final assembly.

26 The chassis frame will be galvanized.

27 Any dissimilar metals that contact each other will be insulated to prevent galvanic corrosion.

28 A full description including grade, thickness, and tensile strength of the proposed material for
29 construction must be included with the bid.

30 **Cab Construction Requirements**

31 The cab shall be a fire apparatus custom, tilt type. No alterations or additions to commercial
32 chassis shall be permitted.

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1 Testing results of cab crash worthiness, in accordance with NFPA 1901 standards, shall be
2 supplied with the bid.

3 **Single Manufacturer**

4 The apparatus cab, body, and chassis are to be manufactured by one builder, or separate
5 divisions of one manufacturer, to ensure compatibility and serviceability and to eliminate
6 divided responsibilities. The use of subcontractors for the manufacturing of the cab, body, or
7 chassis (excluding components) is prohibited.

8 A binding warranty statement obliging the bidder's service center to honor all warranties of all
9 components, and that they will be responsible to facilitate or perform all work associated with
10 necessary repairs will be accepted in lieu of the single manufacturer requirement.

11 **Payment Terms**

12 In order to take advantage of prepayment discounts, the Town of Berwick will consider making
13 partial payments for certain completed components at their discretion.

14 For the financial protection of the purchaser, a fully paid invoice must be provided showing
15 ownership of the paid component(s).

16 The Berwick Fire Department intends to trade in two existing fire apparatus. They are available
17 for inspection at the Berwick Fire Department on request.

- 18 • A 2002 Smeal/KME engine with 1500gpm Waterous pump and 1000gal tank
19 • A 1990 Quality/Spartan engine with 1250gpm Waterous pump and 1000gal tank

20 The bidder shall list the following with their bid:

- 21 • Base price of the apparatus.
22 • A dollar amount of discount for payment of completed chassis.
23 • A dollar amount allowed for each trade in vehicle
24 • A final price, less discounts and trade-ins.

25 The bid amount shall be considered the final price noted above.

26 All certificates of origin are to be transferred to the Maine Motor Vehicle title in the name of
27 the Town of Berwick by the vendor and delivered with the apparatus.

28 **Brand Names**

29 Whenever a brand or manufacturer's name is used in these specifications, it is included for
30 descriptive purposes and to establish a level of quality. Products that are equivalent to those
31 named may be proposed, providing that full supporting documentation is furnished establishing
32 such equivalency. Simply providing manufacturer literature WILL NOT be considered
33 justification for the substitution.

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- 1 All substitutions must be listed as exceptions for evaluation.
2 The Fire Department representatives shall be the sole judge of whether the substitution is
3 acceptable as an equivalent.

4 **Evaluation and Exceptions**

5 Any exception or variation in construction, performance, test, or items of equipment between
6 the purchaser's specifications and the bidder's proposal shall be detailed and submitted on
7 sheets provided along with the bidder's proposal, in bid sequence, and citing line numbers. The
8 bidder must explain in detail, and with full supporting data, how the proposed deviation meets
9 or exceeds the specifications and why it is necessary.

10 The purchaser reserves the right to determine which (if any) deviations are acceptable.

11 A complete set of contractor specifications of the proposed apparatus must be submitted with
12 the bid, in order of these specifications. SUBMISSION OF THE CONTRACTOR SPECIFICATIONS IN
13 BID SPECIFICATION ORDER IS A REQUIREMENT, NOT OPTIONAL.

14 Discrepancies found in the contractor's specifications will be considered noncompliance.

15 General layout drawings showing the front, rear, left, right, and top view of a representative
16 apparatus must be submitted with the bid for the purpose of comparison.

17 The purchaser's specifications shall, in all cases, govern the construction of the apparatus,
18 unless a properly documented exception or deviation was approved. ANY BID INDICATING THAT
19 THE MANUFACTURER'S PROPOSAL SHALL SUPERCEDE THE PURCHASER'S SPECIFICATIONS WILL
20 BE CONSIDERED A COMPLETE SUBSTITUTE SPECIFICATION AND IMMEDIATELY REJECTED.

21 **Prototype Apparatus**

22 No prototype or experimental apparatus will be accepted. The builder must demonstrate that
23 they have successfully produced and sold apparatus of the same design and of the same
24 material in the past two years.

25 **Manufacturer's Reliability**

26 The manufacturer must be satisfactory to the Berwick Fire Department from the standpoint of
27 experience, reliability, and demonstrated ability to manufacture equipment, comparable to size
28 and type, as specified, for the past five years. A list of fire departments, located in the State of
29 Maine or New Hampshire, that have purchased the same type of apparatus from the bidder
30 over the past five years must be supplied along with the bid for physical evaluation.

31 **Performance Bond**

32 A performance bond in the amount of one hundred percent (100%) of the bid shall be furnished
33 by the successful bidder within thirty days after receiving the official notice of award of

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1 contract. Failure of the contractor to complete delivery according to the contract and
2 specifications will be cause to begin action for forfeiture of performance bond.

3 The bond shall also guarantee compliance and performance with the warranty provisions of the
4 specifications.

5 **Bond Suppliers Qualifications**

6 The bonds furnished by the successful bidder shall be from a surety company authorized to
7 underwrite surety bonds in the State of Maine with a minimum A.M. Best rating of A. The
8 purchaser may review the financial condition of the surety and accept or reject any surety at its
9 discretion. Sureties must submit bonds in a form that will be subject to the approval of the
10 purchaser.

11 **Product Liability Insurance**

12 Product liability insurance of not less than \$5,000,000 shall be supplied by the bidder.
13 Documentation of the amount of product liability carried by the manufacturer and the name of
14 the insurance carrier shall be provided by the bidder at the time of bid submission. The
15 successful bidder shall defend any and all suits and assume liability for the use of patented
16 device or article forming a part of the apparatus furnished under the contract. Failure to supply
17 a copy of the Certificate of Insurance with the bid will be cause for immediate rejection of the
18 bid.

19 **Factory Authorized Service Facility**

20 In order to maintain this complex piece of apparatus, the experience and reliability of the
21 factory authorized service center is of major concern to the Berwick Fire Department. The
22 service facility must comply with the following criteria in order to be considered:

23 The facility must have a minimum of two years of experience repairing and maintaining fire
24 apparatus of the make and type of apparatus being bid.

25 The facility must be within 100 road miles of Berwick.

26 Adequate indoor heated facilities with factory trained technicians to perform repairs, including
27 power train, chassis, pump, generator, and controls, must be provided.

28 A minimum of one equipped mobile shop vehicle must be available at the service center
29 location for warranty work at the fire department.

30 The bidder shall submit the location, description, and recent photos of the service center and
31 mobile service unit(s) along with the bid.

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1 Replacement Parts

2 The bidder must ensure that a stock of routine repair parts is maintained at the service center
3 location cited above. The Fire Department reserves the right to reject bids of vendors who
4 cannot produce satisfactory evidence that this inventory is available and that they can furnish
5 promptly all other parts needed for service or repair of the equipment herein specified.

6 The Fire Department reserves the right to visit the facility for purpose of evaluation and reject
7 any bidder who, in the department's sole opinion, does not fully comply.

8 Warranties

9 The apparatus will have a minimum two-year full bumper to bumper warranty for defects in
10 materials, design, workmanship, or other failure of all manufacturer provided, or installed parts
11 or equipment.

12 The apparatus will have a minimum five year engine, powertrain, and suspension warranty.

13 The cab and body shall have a minimum ten-year structural warranty from defects in materials,
14 design, workmanship, or other structural failure.

15 The sub-frame will have a twenty-year warranty against defects in material, design, or
16 workmanship, or other structural failure.

17 The apparatus will have a ten-year paint, lettering, and decal warranty against blistering,
18 peeling, any other adhesion defect, or corrosion.

19 The pump will have a minimum five-year manufacturer's warranty for defects in materials,
20 design, or workmanship.

21 All plumbing will have a ten-year warranty against defects in materials, design, workmanship,
22 and corrosion.

23 The water tank will have a lifetime warranty.

24 All warranties will begin on the date that the apparatus is accepted by the Department.

25 All warranties will include parts and labor.

26 The manufacturer will responsible for complying with or facilitating all warranty repair or
27 replacements, such that the Department will not be required to deal with any third party
28 suppliers or repair shops.

29 Delivery Terms

30 The apparatus shall be delivered by the bidder under its own power within 300 calendar days
31 from the date of notice of award, with all equipment specified, to the Berwick Fire Department
32 (rail or truck freight not acceptable).

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1 The bidder must submit a firm delivery time (number of calendar days from date of order to
2 date of delivery) of said apparatus with his bid. Quoting number of days after receipt of all
3 components is unacceptable.

4 A deduction of \$200 per day may be made for each day over and above the quoted delivery
5 date. The liquidated damages for delay will also apply if the unit is delivered and rejected until
6 the unit is returned meeting specifications.

7 **Training/Demonstration**

8 After delivery of the apparatus is accepted, a qualified representative of the manufacturer will
9 provide 2 session of on-site training at the Berwick Fire Department, one will be scheduled
10 during a weekday evening and one will be scheduled during a weekend day.

11 Training sessions will be scheduled with agreement between the manufacturer and the Berwick
12 Fire Department. In the event of a conflict, the Berwick Fire Department will have final say on
13 acceptable dates and times.

14 On-site training will be to the satisfaction of the Berwick Fire Department and will include
15 classroom and hands on demonstration that covers at a minimum:

- 16 • Operation of the vehicle
- 17 • Operation of all vehicle systems
- 18 • Operation of the fire pump and related options
- 19 • Operation of all other installed vehicle options.
- 20 • Basic vehicle maintenance

21 **Operation and Service Documentation**

22 The contractor shall supply, at time of delivery, at least one electronic set and one hard copy
23 set of complete operation and service documentation covering the completed apparatus as
24 delivered and accepted. The documentation shall address at least the inspection, service, and
25 operations of the fire apparatus and all major components thereof. The contractor shall also
26 provide documentation of the following items for the entire apparatus and each major
27 operating system or major component of the apparatus:

- 28 • Manufacturers name and address
- 29 • Country of manufacturer
- 30 • A contact or source for requests of service and technical information
- 31 • Parts and replacement information
- 32 • Descriptions, specifications, and ratings of the chassis, pump, and ancillary operating
33 system(s) (generator, hydraulic pump, etc. as applicable)
- 34 • Electrical documentation for low voltage and line voltage systems to include the
35 following information: schematics of circuits for all electrical components and wiring,

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1 harness layout, location of electrical components, safety interlocks, alternator-battery
2 power distribution circuits, and input/output assignment sheets or equivalent circuit
3 logic implemented in multiplexing systems. This documentation will be specifically
4 prepared for the individual apparatus rather than a general document designed to
5 accommodate the manufacturers general apparatus design.

- 6 • Pump and plumbing schematics.
- 7 • Pump operation and parts manuals are to be provided in flash drive format.
- 8 • Hydraulic schematics as applicable.
- 9 • Lubrication charts
- 10 • Operating instructions for the chassis, any major components such as the pump or any
11 auxiliary systems
- 12 • Instructions regarding the frequency and procedure for recommended maintenance
- 13 • Safety considerations
- 14 • Limitations of use
- 15 • Inspection procedures
- 16 • Apparatus body, chassis, and other component manufacturers warranties
- 17 • Copies of required manufacturer test data or reports, manufacturer certifications and
18 independent third-party certifications of test results
- 19 • A safety data sheet (SDS) for any fluid that is specified for use on the apparatus
- 20 • One copy of the FAMA Safety Guide

21 The contractor shall deliver with the apparatus all manufacturers operations and service
22 documents supplied with components and equipment that are installed or supplied by the
23 contractor.

24 **Apparatus Production Photos**

25 Photos of the apparatus shall be provided to the Department at the following intervals:

- 26 • Chassis arrival to the OEM
- 27 • Each week of production at the OEM
- 28 • Upon completion of production

29 **Pre-Construction Meeting**

30 There shall be a pre-construction meeting. The purpose of this meeting is to finalize all aspects
31 of the specifications, discuss and clarify all design details of the apparatus, and to share or
32 provide all information so all parties are in agreement on the apparatus being constructed.

33 The apparatus manufacturer shall create and forward to the Town of Berwick a "Pre-
34 construction" document containing the following items:

- 35 • Complete specifications of the apparatus including the chassis

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- 1 • Detailed amp draw report
- 2 • Listing of clarifications or questions from the manufacturer that require attention (shelf
- 3 locations, lettering details, etc.)
- 4 • A minimum of two packets of 11" x 17" or larger drawings. Each packet will contain an
- 5 elevation view drawing for each side of the apparatus, a top view, and in in cab layout at
- 6 a minim.

7 During this pre-construction meeting, any changes or clarifications must be documented.

8 **Final Inspection**

9 The customer will inspect the final apparatus prior to it leaving the apparatus body

10 manufacturer's facility. This will allow any changes that may be required to be done so in a

11 timely and inexpensive manner. After leaving the facility, all repairs or alterations will be

12 performed by either the Dealer or an OEM approved service center.

13 The cost for two Department representatives to perform this visit will be borne by the vendor,

14 to include transportation, lodging, and other associated fees.

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1 **Section-2 Cab and Chassis**

2 **Vehicle Size**

3 The ideal apparatus would be 31' long and 9'6" high, while maintaining aggressive angles of
4 approach and departure. It is understood by the Department that the large amount of
5 equipment, water, and features that are specified on the apparatus will drive the overall size of
6 the units. Therefore, the final overall maximum dimensions will be left to the discretion of the
7 vendor, to configure in the most functional and compact manner possible. No vendor will be
8 automatically disqualified due to apparatus size, but size will be used as one of the several
9 important factors in selection of a bid deemed most advantageous by the Department.

10 **Frame**

11 The chassis frame will be galvanized to prevent corrosion.

12 **Tow Eyes**

13 Two heavy duty tow eyes having 2-1/2" diameter holes shall be securely attached to the chassis
14 frame rails at the front of the apparatus. They shall extend through the front of the bumper.
15 The tow eyes shall be chrome plated.

16 Two heavy duty tow eyes having 2-1/2" diameter holes shall extend to the rear of body, and
17 will be accessible without the need to climb under the truck. The tow eyes will be chrome
18 plated.

19 **Bumper**

20 The front bumper will be made of structural steel channel.

21 The bumper will be sized to extend forward as short as possible while accommodating the
22 specified features installed in/on it.

23 The bumper will have angled front corners to make it more visually appealing.

24 The top of the bumper will be covered in aluminum tread plate.

25 An access door will be installed in the top of the bumper to allow access for maintenance and
26 operation of the winch. The door will be hinged, and will have a gas cylinder installed to hold
27 the cover open.

28 The bumper finish will be as specified under the paint section of these specification.

29 **Winch**

30 An electric winch will be installed in the front bumper with a minimum capacity of 12,000lb.

31 A four way roller fairlead will be installed where the winch cable exits the bumper.

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1 A spring loaded cable tensioner or "level winder" will be installed on the cable drum.

2 **Mud Flaps**

3 The vehicle will have mud flaps installed to the rear of all wheels. The mud flaps shall be a
4 minimum of 3/8" thick to prevent "sailing."

5 **Axle and Suspension**

6 The axles, suspension, and driveline will be properly sized to accommodate the apparatus'
7 estimated in service weight.

8 Front axles will have a fluid level sight glass in the hub ends.

9 A driver controlled differential lock shall be installed on the rear axle. The differential lock shall
10 be controlled by a virtual button on the Vista display and control screen. The Vista display shall
11 also indicate when positive engagement of the differential control has occurred.

12 The vehicle will have a nominal cramp angle of 45-degrees or better with the tires installed.

13 **Wheels**

14 All wheels will be polished aluminum.

15 All lug nuts will be provided with stainless steel covers.

16 Axle ends will be covered with polished stainless steel trim covers. The front covers will have a
17 cutout for viewing of the oil sight glass.

18 **Tires**

19 Tires will be of a reputable brand name manufacturer, and will be appropriately sized and rated
20 for the vehicle.

21 Rear tires will have a mud and snow type tread design.

22 Tires will be provided with LED tire pressure indicating valve stem caps.

23 **On-Spot chains**

24 On-Spot chains will be provided.

25 The chains will be interlocked with the vehicle drivetrain, and will prohibit engagement,
26 disengagement, or vehicle operation at speeds outside of the operational limitations of the On-
27 Spot system.

28 **Traction Control**

29 The vehicle will be equipped with automatic traction control.

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1 The driver will be able to disengage the traction control for use in the event that the vehicle
2 becomes stuck in the mud or snow.

3 **Power Steering**

4 The apparatus will be equipped with power steering.

5 **Service Brakes**

6 The vehicle will be equipped with all wheel antilock brakes.

7 The vehicles brakes will be properly sized to accommodate the apparatus' estimated in service
8 weight.

9 The brakes will have automatic slack adjusters.

10 All axles will be equipped with brake dust shields.

11 **Parking Brake**

12 The parking brakes will be mechanical spring brakes.

13 The brake will be controlled using a yellow push/pull valve in the driver's console.

14 **Jacobs Engine Brake**

15 A Jacobs engine brake will be installed.

16 An on-off control switch and a high-medium-low selector switch shall be mounted in the cab
17 accessible to the driver.

18 A cutout relay will disable the compression brake when in pump mode or when an ABS event
19 occurs.

20 The engine compression brake shall activate upon 0% accelerator when in operation mode and
21 actuate the vehicle's brake lights.

22 **Air System**

23 **Air Compressor**

24 An 18.7CFM air compressor, or larger, will be installed. The intent is to provide adequate
25 supply for the optimum performance of the fire pump air-primer and other pneumatic
26 accessories with the engine at an idle.

27 **Air Dryer**

28 The chassis air system shall be equipped with an air dryer to remove moisture from the air in
29 order to help prevent the air lines from freezing in cold weather and prolong the life of the
30 braking system components.

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1 Air Inlet

2 A brass 1/4" industrial air inlet with a male connection shall be provided.

3 The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly
4 into the wet tank of the air brake system.

5 The inlet will be provided with a check valve, so that air will flow into the truck, but will not leak
6 back out when the shore line is disconnected.

7 The inlet shall be located in the driver's door jamb adjacent to the electrical shore inlet.

8 Air Reservoirs

9 The vehicles will be supplied with four air reservoirs. A wet tank, one for the front axle, one for
10 the rear axle, and an isolated tank for all pneumatic accessories.

11 The isolated reservoir will be a minimum of 2000 cu. in. The supply side of the reservoir shall be
12 equipped with a check valve to prevent depletion of the air brake system.

13 The air horns, air hose reel, and fire pump air primer will be supplied from the isolated tank.

14 Manual spring loaded moisture ejector valves will be supplied for each tank with a pull cable for
15 ease of operation.

16 Air Lines

17 Air brake lines shall be constructed of color coded nylon tubing routed in a manner to protect
18 them from damage.

19 Brass compression fittings will be used.

20 Air Horns

21 Dual air horns shall be provided.

22 The horns shall be mounted through the front bumper.

23 Horns will be Hadley E-Tone, Grover Stutter Tone, or similar tone and volume.

24 Cooling System

25 The cooling system shall have sufficient capacity to meet extended periods of full load
26 operation in local ambient temperatures (from -20°F to 110°F) and maintain the engine at a
27 temperature not to exceed maximum or minimum operating temperature as recommended by
28 the engine manufacturer. High temperature and low coolant alarms shall be provided in the cab
29 and at the pump panel.

30 A translucent surge and de-aeration tank shall be provided with a low coolant sensor installed.

31 All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection
32 from chafing, crushing, or contact with other moving parts.

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1 A clutch-type fan is to be provided with automatic fan control. The fan shall engage when the
2 air conditioner is on and when the fire pump is engaged.

3 Heater hoses are to be insulated and have isolation valves.

4 A coolant filter and sufficient ethylene glycol antifreeze agent shall be added to the cooling
5 system to provide freeze protection to -34°F.

6 **Engine Pump Heat Exchanger**

7 A heat exchanger shall be installed between the engine and the radiator. The heat exchanger
8 shall be designed to prohibit water from the pump from coming in contact with the engine
9 coolant. This shall allow the use of water from the discharge side of the pump to assist in
10 cooling the engine.

11 **Air Intake**

12 A dry-type air cleaner, suitable for the engine being proposed, shall be installed and mounted
13 as to provide easy access for serviceability. The air intake shall be no less than 48 inches off the
14 ground.

15 A mechanical air restriction indicator will be mounted where visible from the in-cab service
16 door. It shall also trigger a warning light on the dash to indicate a clogged air filter.

17 A system designed to prevent water and embers from reaching the air filter meeting NFPA
18 standards shall be provided.

19 A Charge Air Cooler System will be installed to ensure adequate cooling of the turbocharged air
20 for proper engine operation and maximum performance.

21 **Engine**

22 The vehicle will have a minimum of a 450hp turbocharged diesel engine

23 **Exhaust**

24 The Exhaust pipe will discharge on the officer's side of the vehicle in front of the rear tire, and
25 will accept a manufacturer supplied Magna-grip in-house exhaust ventilation system tip.

26 Any exhaust system that includes a "regeneration" cycle will have controls that both inhibit the
27 cycle, or begin the cycle.

28 **Transmission**

29 The vehicle will be equipped with an Allison Automatic Transmission.

30 The transmission will be programmed to allow shifting of all gears WITHOUT the need to
31 disengage the mode lockout.

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1 The transmission will automatically shift to neutral when the parking brake is engaged, unless
2 the pump is in gear.

3 **Vehicle Speed**

4 Due to the large travel distances in the response area of the Department, it is the intent of the
5 Department to purchase a vehicle that is capable of effectively accelerating, maintaining speed,
6 and climbing grades of up to 8% based on the local topography.

7 Bid submittals will identify projected acceleration time to 35mph on a 0% grade, and estimated
8 maintained speed on an 8% grade. All performance estimates will be while fully loaded with
9 water and equipment allowance. These estimates must meet or exceed NFPA requirements,
10 and the performance acceptance test of the truck will be held to these projected performance
11 metrics.

12 The minimum acceptable top speed of the vehicle will be 65mph. The vehicle speed will be
13 limited at 68mph per NFPA 1901.

14 **High Idle**

15 The engine high idle control shall maintain the engine idle at approximately 1250 RPM when
16 engaged.

17 The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so
18 that when activated, it will operate the engine at the appropriate RPM to increase alternator
19 output. This device shall operate only when the emergency master switch is activated and the
20 transmission is in neutral with the parking brake set. The device shall disengage when the
21 operator depresses the brake pedal, or the transmission is placed in gear, and shall be available
22 to manually or automatically re-engage when the brake is released, or when the transmission is
23 placed in neutral.

24 **Fuel System**

25 The fuel tank will be constructed of stainless steel.

26 The fuel tank will be sized to allow for a minimum of 10 hours of continuous pump operation
27 under full load.

28 The tank shall be secured with two wrap-around T-bolt type stainless steel straps. Each strap
29 shall be fitted with protective rubber insulation. This design allows for tank removal from below
30 the chassis.

31 The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines
32 from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall
33 be provided at the top of the tank. The vent shall be connected to the filler neck to prevent

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1 splash-back during fueling operations. A .50" NPT drain plug shall be provided at the bottom of
2 the tank.

3 Sufficient length fuel lines and pump wiring will be installed coiled on top of the tank to allow
4 lowering of the tank without the need to disconnect them first.

5 The fuel fill will be on the Driver's side.

6 The fuel system will include a fuel filter/water separator. The separator will have a drain valve
7 to allow removal of water.

8 **Battery trays**

9 Battery trays will be constructed of stainless steel.

10 Trays will have ventilated stainless steel covers that keep them free of moisture and debris.

11 Battery covers will have a retention or latch system that is removable without the need for
12 tools.

13 Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets
14 to prevent movement, vibration, and road shock.

15 The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed.

16 Each battery tray shall be equipped with drainage.

17 **Maintenance Access**

18 All engine, transmission, and other powertrain fluid dipsticks, fill tubes, reservoirs, sight glasses,
19 etc. that may be checked or topped off as part of general vehicle maintenance will be grouped
20 in one location, and accessible through an access door without the need to tilt the apparatus
21 cab.

22 Any installed sensors that read out vehicle maintenance data such as fluid levels, temperature,
23 etc. will be accessible through the V-mux display console.

24 **Tilt Cab Design**

25 The vehicle shall have an all-aluminum or stainless steel, full-tilt cab designed exclusively for the
26 fire service and provide seating for five or more firefighters.

27 The cab will be a four door design.

28 The cab will be equipped with both front and side airbags at a minimum.

29 The cab front corners shall be contoured.

30 Full length and width fender well liners shall be provided.

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1 Inside the cab shall be of the open design and insulated against heat and sound intrusion. A
2 fully insulated engine cover shall be provided between the driver and officer. The hood shall be
3 insulated on the engine and cab side.

4 The engine tunnel will have a low-rise contoured design to provide sufficient seating and elbow
5 room for the driver and the officer. The engine cover shall blend in smoothly with the interior
6 dash and flooring of the cab.

7 A grounded aluminum equipment mounting plate will be installed on the engine tunnel.

8 Cab door interior, any other surfaces subject to impact by a firefighter or equipment, or any
9 area where there is a grab handle installation inside the cab will be a ruggedized design. Plastic
10 or vinyl paneling will not suffice.

11 The cab shall be designed to effectively transmit roof loads downward into the subframe
12 structure to help protect the occupant compartment from crushing in a serious accident.

13 The cab roof shall be constructed from bright aluminum treadplate, and designed to support
14 the load of a firefighter weighing 300lb without denting or deflection.

15 An electric over hydraulic cab tilt system will be provided.

16 Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the
17 raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure.

18 The safety flow fuses shall operate when the cab is in any position, not just the fully raised
19 position

20 A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to
21 provide additional safety for personnel working under the raised cab.

22 A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when
23 the cab is not completely locked into the lowered position.

24 The cab tilt control will be wired so that it is necessary for the parking brake to be set, battery
25 switch on, and transmission in neutral for the cab to tilt. The cab will be able to tilt whether the
26 engine is running or not.

27 The cab tilt controller will be mounted on the front wall inside the pump compartment, on
28 whichever side of the apparatus that allows a better fit.

29 The cab tilt will be designed to prohibit the cab from hitting any bumper mounted equipment.

30 **Cab Layout**

31 **Seating positions**

32 The driver's position will have an air-ride seat, adjustable up and down as well as forward and
33 backward.

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- 1 The steering column will be both tilt and telescope adjustable.
- 2 The officer's seat will have in-the-seat walk-away storage for a Scott 4500 Airpack-75.
- 3 The rear facing seat behind the officer will have walk-away storage for a Scott 4500 Airpack-75.
- 4 There will be two forward facing seating positions in the middle of the rear wall, with walk-
- 5 away storage for a Scott 4500 Airpack-75, and flip down seats.
- 6 The in-seat SCBA mounting system will lock the SCBA securely in place to prevent them from
- 7 dislodging in the event of an accident or when tilting the cab. The locking mechanism will be
- 8 one that releases easily, and does not have the potential for donning an SCBA while it is still
- 9 locked into the seat, which would result in the firefighter having to doff the SCBA to unlock it
- 10 (such as the strap used in some ZICO products).
- 11 The location behind the driver's seat will be an EMS storage cabinet.

12 **EMS Cabinet**

- 13 The EMS Storage cabinet will be accessible from the outside of the cab through a hinged door.
- 14 It will also be accessible through a door on the interior.
- 15 The cabinet will be ventilated to the inside of the cab, to maintain the interior cabinet climate
- 16 the same as the cab interior climate.
- 17 The cabinet minimum dimensions will be 22"-wide, 30"-deep, and 42"-tall, with more space
- 18 preferable as cab layout allows.
- 19 The cabinet will be outfitted with two adjustable height shelves.
- 20 The cabinet will be lockable by key. Both access doors will be keyed the same.

21 **Climate Control System**

- 22 Air conditioning will be provided with adjustable vent discharges in both the front and rear
- 23 portions of the cab. The air conditioning unit will be mounted at the ceiling level, keeping the
- 24 engine tunnel clear of obstructions.
- 25 Any air conditioning component which needs to be accessed to perform system
- 26 troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced
- 27 items shall be replaceable by one person using basic hand tools.
- 28 The cab heater will utilize the same ductwork as the air conditioning unit, plus will have a
- 29 windshield defog option.
- 30 The climate control system will have the option of recirculating cabin air, or fresh air intake.

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1 The climate control system shall include a gravity drain for water management. The gravity
2 drain shall remove condensation from the air conditioning system without additional
3 mechanical assistance.

4 The cab will include 4 adjustable 12v electric fans at the ceiling level. One on the officer's side
5 near the windshield towards the outside of the cab, one on the driver's side near the
6 windshield towards the outside of the cab, one in the area just behind and to the inside of the
7 driver's seat, and one in the area just behind and to the inside of the officer's seat.

8 **Mirrors**

9 The vehicle will have heated and power adjustable west coast style rear view mirrors that are
10 adjustable from the driver's seat. They will also include a convex spotter mirror.

11 **Windows**

12 The vehicle will have power windows. All windows will be controlled at the individual doors, as
13 well as all windows being able to be controlled from the driver's seat.

14 Driver and officer door windows shall have the support pillar located toward the front of the
15 window. There shall be a vent that can be opened and closed within the window itself, located
16 towards the front.

17 **Windshield Wipers**

18 The windshield wipers will be driven by separate electrical motors. Air powered wipers will not
19 be used.

20 In addition different intervals of low to high speed, the windshield wipers will also have and
21 intermittent function.

22 Windshield Wipers will be of a "wet arm" design.

23 **Entertainment System**

24 An AM/FM/Bluetooth/Aux. input radio will be installed. It will be within reach of both the
25 driver and the officer.

26 The entertainment system will have four full range speakers at a minimum, with two in the
27 front of the cab, and two in the rear of the cab.

28 **V-Mux Controls**

29 One touch screen V-Mux control will be installed visible to and easily controlled by the driver.

30 One (in total, not one per truck) spare control head will be provided along with the trucks in
31 case of failure.

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1 V-Mux control programming and in cab controls layout will be in accordance with this section,
2 and the Lighting and Electrical section later in these specifications.

3 A vehicle back-up camera will be installed and will be visible through the V-Mux control screen.
4 The camera will come on automatically when the vehicle is placed in reverse, and turn off
5 automatically when any other gear is selected. The driver will also have the option to turn the
6 camera on when the vehicle is not in reverse, or to turn the camera off and return to the main
7 control screen when the vehicle is in reverse.

8 **In-Cab Siren/Horn Controls**

9 A foot pedal control for the Federal-Q siren will be installed on the driver's side floor.

10 The air horns will be controlled from the center of the steering wheel.

11 Hand controls for both the Federal-Q siren, and the air horn will be installed on the officer's
12 side on the engine tunnel, and in a location that is easily accessible to the officer, but not prone
13 to accidental activation by equipment on the cowling.

14 A siren brake control button will be installed that easily accessible to the driver and the officer,
15 or siren brake control buttons will be installed for both individual seating positions.

16 **Grab handles**

17 All exterior grab handles on the trucks will be knurled, with a minimum diameter of 1 ¼".

18 The brackets will be chrome plated.

19 The bottom bracket on vertical handles will have a drain hole in the lowest point to allow the
20 escape of any moisture.

21 Handles will be provided to the rear of each cab door, and will be of a design that allows the
22 hanging of a turnout coat.

23 Interior grab handles will also be provided at each door position to assist in entering and exiting
24 the cab. These will be on the side of the door opening towards the front of the apparatus,
25 located in a convenient and ergonomic location when entering the cab.

26 The design of these interior handles will match the general interior theme of the cab, and will
27 be large enough to accommodate a firefighter's gloved hand.

28 **Other In-Cab Features**

29 A plate or placard listing the vehicle total height, length, width, and loaded weight will be
30 mounted and visible to the driver.

31 There will be four individually switched, adjustable direction reading lights installed in the cab.
32 One each to the inboard side of the driver and officer's seat's, and on each side in the rear of

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- 1 the cab located for convenient use by passengers in the rear while seated and belted. They will
- 2 have the option of white or red lighting.
- 3 Cup holders will be provided for the driver and officer seating positions.

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1 **Section-3 Body**

2 **Body Construction**

3 The chassis frame rails shall be fitted with fiber reinforced rubber or comparable material to
4 isolate the body frame members from direct contact with chassis frame rails.

5 The sub frame shall be mounted to the chassis by a means that allows for twisting of the chassis
6 frame under driving conditions, while limiting the transfer of that stress to the body or sub-
7 frame. Body mountings that do not allow relief from chassis movement shall not be
8 acceptable.

9 A structural analysis of the body design shall have been performed and evidence of testing
10 techniques and results made available upon request.

11 **Body Style**

12 The apparatus body will be a rescue-style pumper with full height sides that do not leave a
13 ledge or catwalk beside the hose bed.

14 The body and cab edges will be designed to align with one another for a natural and pleasing
15 appearance.

16 **Body Rub Rails**

17 Rub rails shall be provided along the lower edge of the body.

18 Rub rail assemblies shall be spaced out and isolated from the body with nonmetallic material.

19 Rub rails are to be removable to allow for replacement in case of damage.

20 The outside edge of the rub rails shall be even with any fenderettes and/or bolt-on steps to
21 prevent snagging

22 **Hose Bed**

23 The hose bed shall be located above the water tank.

24 The floor of the hose bed will be constructed of slats that allow for drainage and circulation of
25 air to the atmosphere.

26 The hose bed will be sized for 600' of 2 ½" hose, and 1,000' of 4" hose.

27 The hose bed storage area shall be covered with two hinged doors. The doors shall be hinged
28 on the outside edges, utilizing full length stainless steel piano hinges. The doors shall lift up and
29 out towards the outside of the body. The outside sheet shall be constructed of anti-slip tread
30 plate.

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1 The hose bed covers will be designed to lock in both the open and closed positions to prevent
2 accidental unintended movement.

3 The maximum force required to open or close the hose bed doors will be 15-lbs.

4 The hose bed doors will include LED lighting that illuminates the hose bed area when the doors
5 are opened.

6 There shall be one hose bed divider installed in the hose bed. Where no obstruction such as a
7 fill tower are present, slide rails shall allow full movement of the divider along the width of the
8 hose bed.

9 **Horizontal Surface Finish**

10 All horizontal surfaces will covered with aluminum treadplate.

11 Treadplate shall be the NFPA-compliant embossed nonslip type.

12 If the bottom will remain open, allowing any debris to fall out without becoming trapped, then
13 aluminum grip strut grating may be used in lieu of treadplate.

14 **Stepping Surfaces**

15 All steps shall be able to withstand a load of at least 500 pounds.

16 Steps shall be provided at any area that personnel may need to climb and shall be adequately
17 lighted.

18 An integral ladder will be provided at the rear of the apparatus to provide access to the hose
19 bed and top compartments.

20 **Compartments**

21 **Compartments Design, General**

22 All compartments will have a sweep out floor design to allow easy cleaning.

23 A drip edge or J-channel will be installed directly above all compartment openings to divert
24 excessive water from entering the compartments.

25 The pump module compartment on either side of the apparatus will be roll up style doors. The
26 doors will be of a design that operates reliably and smoothly without the need for regular
27 lubrication.

28 Compartments with roll up doors will have a splash guard installed to keep water from being
29 splashed throughout the interior of the compartment while the door is being rolled up. The
30 pans shall also serve to protect the door from damage due to impact from behind or below.

31 All compartment doors, with the exception of the pump module compartment on either side of
32 the apparatus, will be hinged type doors.

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1 Weep holes will be installed at the bottom of the doors to drain moisture from between the
2 door panels.

3 Vertical hinged doors will be no wider than 30"; wider openings will require double doors.

4 On compartments having double doors, the secondary door leaf will be latched at the top and
5 bottom, and will utilize a pull cord handle that runs the height of the inside of the door leaf.

6 The pull cord will have a diameter of approximately ½"

7 Horizontally hinged compartment doors will utilize two pressure filled gas strut cylinders to
8 assist in opening the door and will hold it in the open position. One strut will be located at each
9 end of the door.

10 Vertically hinged door compartments will utilize a spring loaded door holder that shall close the
11 door automatically when it is positioned past center or return the door to the fully open
12 position if the center point is not reached and the door is released.

13 The primary hinged door leaf of all compartments will utilize a recessed D-ring style, stainless
14 steel handle.

15 Compartment doors will be non-locking.

16 There shall be Turtle Tile Plastics interlocking squares in all of the body compartments. The
17 Turtle Tiles shall be applied in all body compartment shelves, adjustable-height trays, floor-
18 mounted trays, and on compartment floors that do not contain floor-mounted trays. No Turtle
19 Tiles shall be applied on compartment floors underneath floor-mounted trays

20 Compartments shall be well vented to atmosphere to allow for circulation of air with the doors
21 closed. Compartment vents will be designed and located to prevent entry of debris and
22 moisture, particularly when driving on wet road surfaces.

23 Each compartment will be equipped with drain holes that allow standing water to exit the
24 compartment to the ground. The drains will be located or designed to prevent entry of debris
25 and moisture, particularly when driving on wet road surfaces.

26 **Pump compartment**

27 The driver's side pump compartment will include, a free floating hose well tray in the running
28 board area capable of holding a 50' and a 25' section of rolled 4" supply hose. The hose tray
29 will be designed to lift up without damage to the tray or items in the compartment if struck
30 from beneath.

31 The officer side pump compartment will include, a free floating hose well tray in the running
32 board area capable of holding 100' of flat loaded 1 ¾" hose and a TFT automatic nozzle
33 connected to a side discharge. The hose tray will be designed to lift up without damage to the
34 tray or items in the compartment if struck from beneath.

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1 There will be two transverse hose beds inside the enclosed portion of the pump compartment.
2 The beds will include removable trays to facilitate loading of hose outside of the truck, then
3 installing the trays. Each tray will be capable of holding 200' of 1 3/4" hose plus a TFT automatic
4 nozzle. The trays will extend as far towards the inside surface of the compartment door as
5 practical to help prevent the hose from snagging on the roll up door track as it deploys. The
6 truck will come equipped with two spare trays.

7 The floor of the transverse hose beds will have sufficient drainage holes to allow standing water
8 to drain from the trays, and out the bottom of the pump module.

9 The maximum height to the bottom of the highest transverse hose bed will be 5' from the
10 ground.

11 An air horn control button will be installed at the pump panel, and will be appropriately labeled
12 as such.

13 **Other compartments**

14 Compartment sizing, location, and design not outlined above will be customized to
15 accommodate the equipment list provided by the Department in Section-7 of these
16 specifications. The list will also include preferred storage locations for the equipment.

17 Final design and layout must be approved by the Department as part of the pre-construction
18 meeting, and will be modified by the bidder as requested at that point if necessary.

19 Any reasonable sized area at the top of the body that is not otherwise utilized will be made into
20 "coffin" style compartments for general storage use. The compartment doors will be tread
21 plate finish, will utilize pressurized gas struts to assist in opening of the doors, and will be
22 lighted.

23 **Wheel Chock Storage**

24 Two under body wheel chock mounts will be installed in front of the rear wheel on the
25 driver's side.

26 **Wheel Wells**

27 The fenders shall be integral with the body sides and compartments for a seamless appearance.

28 The fenders shall be fitted with bolt-in removable full circular inner liners in the wheel well area
29 for ease of cleaning and maintenance.

30 The stainless steel fenderette shall be secured to the apparatus body with stainless steel
31 fasteners and shall be easily removable for replacement. Fenderettes that are welded to the
32 apparatus body are not acceptable.

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1 License Plate Bracket

2 There shall be a license plate bracket mounted on the rear of the apparatus and illuminated by
3 a clear LED light.

4 Air Hose Reel

5 A 100' electric rewind air hose reel will be installed.

6 The hose will terminate in a ¼" female universal air fitting.

7 The hose will be supplied by the auxiliary air reservoir.

8 If the will be guided by a 4-way roller fairlead where it exits the apparatus body.

9 A ball stop will be installed on the hose to prevent over-winding.

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1 Section-4 Pump and Plumbing

2 Fire Pump

3 The fire pump shall be a midship-mounted 1,500-gpm, single-stage, split shaft centrifugal fire
4 pump. All necessary mountings, pump drives, shafts, and related equipment for NFPA required
5 pump shift control will be included.

6 The pump shall be equipped with a high-quality, spring-loaded, self-adjusting mechanical seal.

7 An air or air/over electrically operated pump shift, with green indicator lights, shall be provided
8 and mounted in the cab. An additional green light shall be mounted at the pump panel adjacent
9 to the pressure governor.

10 Pump Module Enclosure

11 The pump control panel will be an enclosed side mounted design.

12 A hinged access hatch will be provided on the driver's side to allow access into the pump area.

13 A single panel shall be installed on the officer's side of the pump enclosure. This shall be the
14 area where any officer's side discharges, inlets, steamers, and other pump associated
15 equipment are located. This panel shall be easily removable and held in place with quick release
16 push latches. It shall be fully removable for pump and plumbing access without the need to use
17 hand tools. Any electrical equipment that may be installed shall be equipped with connectors
18 so they may be easily separated from the opening created when the access panel is removed.

19 A removable pan, constructed of stainless steel, will be installed underneath the pump module
20 which substantially encloses the compartment. The pan will be provided with drain holes to
21 allow water to escape to atmosphere. The pan will have a slide-in bottom that allows it to be
22 easily removed. The vehicle exhaust will run through the inside of the pan to heat the enclosed
23 compartment to help prevent freezing of the pump, water lines, and gauges.

24 Plumbing, General

25 All pump piping shall be minimum of schedule 10 marine grade stainless steel and left
26 unpainted. Where vibration or chassis flexing may damage or loosen piping or where a coupling
27 is required for servicing, the piping shall be equipped with Victaulic or rubber couplings.

28 Flexible non-metallic plumbing may also be acceptable.

29 The intake side of the pump plumbing will have an integral relief valve that discharges to
30 atmosphere under the apparatus.

31 A main pump drain valve will be installed at the lowest point of the pump and plumbing that
32 will allow all water in the pump and plumbing to drain completely. There will be no low points

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1 in the system that allow water accumulation to remain in the plumbing when this drain is
2 opened. This drain will be controlled from the driver's side pump panel.

3 Zinc anodes shall be installed in the pump. Two on the intake side, and two on the discharge
4 side.

5 **Pressure Governor**

6 The pump will be controlled by a pressure governor capable of operating in either pressure or
7 RPM mode.

8 The governor will be of a simplistic design, and will not be visually cluttered.

9 The governor will have a programmable pre-set pressure that is easily configurable by the
10 Department without the need for specialized equipment.

11 An interlock system shall be provided to prevent advancement of the engine speed at the pump
12 operator's panel unless the apparatus has "Throttle Ready" indication.

13 **Overheat Alarm**

14 The pump will include an overheat alarm at the pump panel.

15 The alarm will have both an indicator light, and an audible alarm.

16 There will be a push to test button near the indicator to test the function of the light and the
17 audible alarm.

18 **Air Primer**

19 An air primer system will be used.

20 The system will be supplied from the auxiliary air tank on the truck.

21 The system will include the ability to prime the main portion of the pump, as well as to
22 individually pre-prime the side steamer intakes and the front intake on the outboard side of the
23 intake valves.

24 All wetted metallic parts of the priming system are to be of brass and stainless steel
25 construction.

26 **Valves**

27 All valves up to 3" will be swing-out or comparable style stainless steel ball valves

28 All valves will be installed to the inside of the pump compartment behind the pump panel.

29 All valves will be manually operated from the driver's side of the truck with turn to lock pull
30 handle controls, or hand wheel controls.

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1 Intake/Discharge Layout

2 Couplings

3 All connections specified for 1 ½" or 1 ¾" hose will be 1 ½" National Standard Thread (NST)
4 adapted to National Pipe Straight Hose (NPSH) using chromed adapters.

5 All connections specified for 2 ½" or 3" hose will be 2 ½" National Standard Thread (NST)

6 All connections specified for 4" hose will be 4" Storz connectors.

7 All 4" or smaller intake or discharge caps/plugs will be provided with visually appealing lanyards
8 or chains secured to the apparatus to prevent them from being lost.

9 All threaded caps/plugs will be vented.

10 Intakes

11 There shall be a check or clapper valve between the tank and the pump in the tank-to-pump
12 line. The check valve shall eliminate back flow into the booster tank when the pump is
13 connected to a pressurized source.

14 All intakes will be provided with replaceable screens.

15 The truck will have 6" male threaded steamer intakes on both sides.

16 Side steamer intakes will be outfitted with long handle 30° elbows, 6"-female to 4" Storz
17 adapters, and 4" Storz caps.

18 There will be a 2 ½" female intake on the driver's side fitted with a chrome swivel.

19 The side intake will be provided with a chromed plug.

20 There will be a front intake sufficiently sized to flow the rated capacity of the pump. The intake
21 will exit the top of the front bumper with a chromed swivel elbow that allows the intake to spin
22 horizontally. The height to the center of the intake will be at, or above, 36" from the ground.

23 The intake will terminate with a 6" male thread.

24 The front intake will be provided with a chrome long handled cap

25 Discharges

26 There will be two 2 ½" discharges on the driver's side pump panel.

27 There will be one 2 ½" discharge on the officer's side pump panel.

28 2 ½" discharges at the pump panel will be provided with chromed 30° elbows, and 2 ½" to 1 ½"
29 chromed reducers with 1 ½" chromed caps.

30 There will be one large diameter discharge on the officer's side pump panel with a 4" Storz
31 connection.

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- 1 The large diameter discharge will be provided with a 30° elbow and a 4" Storz cap.
- 2 There will be one 1 ½" discharge, with 2" plumbing, on the officers side pump panel, located
3 low on the panel to allow the hose in the running board hose well to remain connected at all
4 times. This discharge will include a check or clapper valve in the plumbing to prevent water
5 hammer from back feeding into the pump.
- 6 There will be one 2 ½" discharge at the rear of the truck. It will be located high, underneath but
7 near the hose bed and toward one side to allow a 2 ½" hose to remain connected at all times.
8 This discharge will include a check or clapper valve in the plumbing to prevent water hammer
9 from back feeding into the pump.
- 10 The rear 2 ½" discharge will be provided with a 30° chromed elbow.
- 11 There will be two 1 ½" discharges with 2" plumbing integrated into the transverse hose beds for
12 1 ¾" pre-connected lines (one in each bed). They will terminate in a swivel connection to allow
13 the hose to deploy from either side of the apparatus without kinking. The swivels will be
14 painted red and yellow respectively to match the valve label color at the pump panel. The
15 swivel connections will be located towards the ends of the hose bed to allow ease of
16 connecting hose. These discharges will include check or clapper valves in the plumbing to
17 prevent water hammer from back feeding into the pump.
- 18 There will be one master stream discharge to the top of the apparatus for a TFT extend-a-gun,
19 with a TFT crossfire monitor. The extend-a-gun will include built in sensors and will be
20 connected to the door open alarm.

21 **Drains**

- 22 All intakes and discharges will be equipped with drains on the outboard side of the valve.
- 23 Drains will be located in the lowest point of the plumbing.
- 24 Drains will discharge directly to atmosphere and not into the pump heater tray.
- 25 All intake and discharge drain valves will be manually controlled by pull or lift type handles at
26 the pump panel on the side of the truck that has the discharge/intake.

27 **Gauges**

- 28 The master intake gauge will distributed such that 50% of the gauge reads in vacuum, and the
29 other 50% reads in pressure.
- 30 All discharge gauges will read in pressure only.
- 31 The master gauges will be located adjacent to each other horizontally, with the intake gauge on
32 the left, and the discharge gauge on the right.

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1 There shall be an LED water tank level gauge on both sides and the rear of the apparatus. The
2 gauge shall indicate Full, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$, and Empty. The gauge shall be at least 8" tall. Each level from
3 $\frac{1}{4}$ to full will be indicated by a different color.

4 **Color coding**

5 Gauge, valve handle, and drain handle will be matching color coded.

6 One crosslay will be red.

7 One crosslay will be yellow.

8 Rear discharge will be white.

9 All others may be colored at the manufacturer's discretion.

10 **Water Tank**

11 The apparatus water tank will be of polymer construction, and will hold between 1,150 and
12 1,200 gallons of water.

13 The tank shall be designed to be completely independent of the body and compartments, and
14 will include design features that allow for the safe lifting and removal of the tank from the body
15 without the need to disassemble the body of the apparatus.

16 All portions of the tank, with the exception of the fill tower, will be enclosed and covered by
17 either the hose bed or a diamond tread plate walking surface.

18 The tank will be baffled and plumbed to the pump such that the truck will be capable of
19 pumping a minimum of 1,000gpm through the tank to pump plumbing.

20 All tank fill couplings shall be backed with flow deflectors to break up the stream of water
21 entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.

22 There will be a tank sump located to facilitate the most effective use of water from the tank.

23 The water intake for the pump will draw from this location.

24 There will be an anti-swirl plate installed above the sump to prevent air from being entrained in
25 the water while pumping.

26 There will be a tank drain line of at least 1 $\frac{1}{2}$ " diameter, with a quarter turn ball valve, from the
27 bottom of the sump to atmosphere. Any drain piping or valve material will be stainless steel,
28 brass, or a similar material resistant to corrosion. The valve will have a pull style control lever
29 that is accessible without the need to climb under the truck.

30 The tank will have a combination vent and manual fill tower easily accessible from the top of
31 the apparatus. The tower lid will be able to be opened without the need for tools.

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- 1 A water tank overflow/air vent pipe will be installed into the fill tower that extends to the rear
- 2 of the apparatus and dumps to atmosphere behind the rear axle. The vent will be located so as
- 3 not to discharge water onto any vehicle components (i.e. the body, axle, on-spot chains, brake
- 4 lines, wiring, etc.)

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Two Rescue Style Pumper Apparatus

1 **Section-5 Lighting and Electrical**

2 **General**

3 The apparatus will have all lighting and indicators as required by the DOT and NFPA.

4 The alternator(s) will be sized to power a minimum of 110% of the rated amperage draw of the
5 operating apparatus systems combined with all running, emergency, auxiliary, and scene
6 lighting; as well as radio, computer, and equipment charging stations noted in these
7 specifications.

8 An amperage draw report will be provided with the bid for all electrical components noted in
9 these specifications.

10 **Batteries**

11 Batteries will be heavy duty maintenance free type.

12 Batteries will be easily accessible for the purposes of jump starting without tilting of the cab,
13 the use of any tools, or the removal of any body panels. Access door(s) and/or remote battery
14 lugs will be acceptable. Battery connections and jump starting lugs will be clearly marked for
15 positive and negative.

16 An on-board battery maintainer will be installed that received 110v power from the shore line
17 plugin. This maintainer will charge the truck batteries when low and will support the 12v power
18 connections that are live while the battery and ignition switches are off, but will not overcharge
19 the batteries while remaining plugged in for long periods of time.

20 **Wiring Methods**

21 Under no circumstances shall diodes, resistors, or fusible links be located within the wiring
22 harness. All such components shall be located in an easy to access wiring junction box or the
23 main circuit breaker area.

24 All electrical connections not made inside the main circuit breaker area or a sealed junction box
25 will be environmentally sealed connections.

26 Radio suppression shall be sufficient to allow radio equipment operation without interference.

27 Each wire shall be function coded several times per foot, continuing throughout the entire
28 harness. In addition to function coding, each wire shall be number, color, and gauge coded.

29 All wiring will be protected by an abrasion resistant loom or braid

30 **DOT Lighting**

31 Headlights will be LED type.

32 The drivers instrument panel will be dimmable, and backlit with white light.

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1 **Compartment Wiring**

2 Compartments will have LED strip lighting

3 All compartment doors will utilize weatherproof proximity switches for activation of
4 compartment lights and to provide a signal to the door open circuit.

5 Compartment door switches will be installed with reasonable access to the switch mounting
6 hardware and wiring to allow replaceable without the need for significant disassembly of body
7 components.

8 **Power and Ignition Switch**

9 The battery and ignition will be two position keyless switches. Positions will be off or on.

10 The switches will be located beside each other in the dashboard near the steering column.

11 A chrome momentary push starter button will be located next to the ignition switch.

12 **V-MUX Electrical Management System**

13 The V-MUX system shall include load shedding and load sequencing functions as an integral
14 part of the system modules. These will be programmed to eliminate excessive voltage drop,
15 and voltage spikes throughout the system.

16 Output devices will be solid state with no moving parts to wear out.

17 The system shall be sealed against the environment, moisture, humidity, salt, or fluids such as
18 diesel fuel, motor oil, or brake fluid. The enclosures shall be rugged to withstand being
19 mounted in various locations or compartments around the vehicle. The modules shall be
20 protected from over voltage and reverse polarity.

21 The display will be dimmable for night operation without impairing night vision.

22 After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as
23 listed in NFPA 1901. These tests shall include, but not be limited to:

- 24 • Reserve capacity test
- 25 • Alternator performance test at idle
- 26 • Alternator performance test at full load
- 27 • Low voltage alarm test

28 The V-Mux system touch screen will control:

- 29 • Emergency lighting
- 30 • Traffic advisor
- 31 • High Idle function
- 32 • 12-v Scene lighting

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Two Rescue Style Pumper Apparatus

- 1 • In cab climate controls
- 2 • PTO Generator power
- 3 • Radio repeater power
- 4 • Cab HVAC controls
- 5 • Mirror heat
- 6 • Engine Brake
- 7 • Rear Differential Lock
- 8 • On-Spot Chains

9 The V-Mux system touch screen will NOT control:

- 10 • Headlights
- 11 • Blinker
- 12 • Ignition
- 13 • Windshield wipers
- 14 • Power windows

15 **Interlock Programming**

16 Daytime running lights will turn off when the parking brake is applied.

17 Ground lighting will turn on when the parking brake is applied.

18 Emergency lighting at or below 6' from the ground will turn off when the parking brake is
19 applied, but may be manually turned back on from the V-MUX controller.

20 **12-V In-Cab Power**

21 12v power noted in this section will be installed such that it allows the power points to be live
22 when the battery switch is on OR when the truck is connected to shore power, but not when
23 the battery is off and the truck is unplugged.

24 There will be four 12v cigarette lighter style power ports installed on the dashboard or towards
25 the front of the engine tunnel.

26 There will be four USB style power ports installed on the dashboard or towards the front of the
27 engine tunnel.

28 There will be one 12v cigarette style power port, one USB style power port, and one 12v
29 terminal block with 2 connection points installed inside the EMS compartment.

30 12v terminal blocks will be installed for the installation of any hard wired charging equipment
31 (e.g. flashlights) noted in the equipment section. Butt splice connections will not be acceptable.

32 The terminal blocks will be guarded to avoid electrical arcing due to accident contact with metal
33 equipment.

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1 12-V Body Power

2 12v power noted in this section will be installed such that it allows the power points to be live
3 when the battery switch is on OR when the truck is connected to shore power, but not when
4 the battery is off and the truck is unplugged.

5 12v terminal blocks with four, or more, contacts each will be installed in each of the side
6 compartments. These installed blocks will be used for the installation of any hard wired
7 charging equipment (e.g. flashlights) noted in the equipment section. The terminal blocks will
8 be guarded to avoid electrical arcing due to accident contact with metal equipment.

9 Emergency Lighting

10 The lights will be sequenced to turn on and off at delayed intervals to apply and remove
11 electrical load gradually.

12 Emergency Lighting shall be LED type

13 The light bar will include a traffic pre-emption light

14 Side and rear emergency lighting will be installed into the body so that it does not extend above
15 the height of the finished body.

16 All emergency lighting will be red, or a combination of red and while to be visually appealing,
17 with the exception of the top rear facing emergency light on the driver's side, which will be
18 blue.

19 LEDs will be of the actual color, with clear lenses.

20 A traffic advisor bar will be installed rear facing with three pattern options of left, right, and
21 caution.

22 Sirens

23 A Federal Q2b siren will be installed on top of the outboard driver's side of the front bumper.

24 A backup electronic siren with PA ability will also be installed. Speaker location for this siren
25 will either be hidden or have an aesthetically pleasing location and design.

26 Mobile Radio Provisions

27 Power and antenna provisions will be installed for two VHF Motorola 1250 mobile radios, and
28 one UHF Motorola 1250 mobile radio.

29 Auxiliary speakers for one of the VHF radios will be installed in the front and rear of the cab, so
30 that audio can be heard uniformly without having to turn the volume up excessively in one area
31 to be heard in the other.

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1 Ground Lighting

2 Ground lights shall illuminate the ground within 30" of the apparatus to provide visibility of any
3 obstructions or hazards. These areas shall include, but shall not be limited to, the area below
4 any steps on the cab or body, side running boards, and the tailboard area.

5 Scene Lighting

6 One 20k lumen LED brow flood light will be installed forward facing on the cab of the
7 apparatus.

8 One 20k lumen LED flood light will be installed rear facing on the rear of the apparatus body.

9 A 15k lumen LED flood light will be installed on each side of the apparatus near the rear of the
10 body, and on each side of the apparatus near the front of the body or on the sides of the cab.
11 That is a total of two lights on each side.

12 Generator

13 A 5-Kw hydraulic PTO generator will be installed on the apparatus.

14 The system must be capable of producing the full nameplate power when driven from the
15 vehicle PTO from idle to maximum engine speed.

16 The generator will be capable of "hot shift", and will be capable of operating while the truck is
17 in drive.

18 Shore Power Inlet

19 A recessed shore line plug will be installed in the driver's door jamb area, which will prevent the
20 door from closing when the line is plugged in.

21 The plug will have NEMA 5-20p pattern.

22 Electrical Distribution

23 Breaker Panel

24 A circuit breaker panel will be installed in the enclosed pump compartment, or the
25 compartment directly behind it.

26 An automatic generator transfer switch will be installed, and will supply the breaker panel from
27 either shore line power when plugged in at the fire station, or generator power depending on
28 which source is live.

29 All outlets will be NEMA 5-20R outlet style.

30 Cord Reel

31 A 200' cord reel will be installed with electric re-wind.

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- 1 Rollers will be provided to prevent cord damage while being pulled in any direction.
- 2 All ball stop will be installed on the cord to prevent over-winding and damage to the junction
- 3 box.
- 4 The cord reel will be rated for 30amps.
- 5 The cord reel will terminate in a four outlet, backlit junction box.
- 6 The junction box will be provided adequate strain relief to allow pulling and general rough use
- 7 without damage or pulling out of the wires.
- 8 Outlets will have a spring loaded covers.
- 9 **Fixed Outlets**
- 10 There will be two-plug electrical outlets installed on either side of the apparatus inside the
- 11 pump panel.
- 12 The pump panel outlets will be rated for 20amps.
- 13 There will be outlets in the cab, on either side of the engine tunnel, near the back of the driver
- 14 and officer's seats.

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1 Section-6 Paint and Trim

2 Paint

3 The Chassis cab will be two-tone painted.

4 The vehicle body will be a single color tone.

5 The front bumper will be a single color tone.

6 Final paint color will be determined at the pre-bid meeting.

7 After the body and components have been fabricated and assembled they then shall be
8 disassembled prior to painting so when the apparatus is completed there shall be finish paint
9 beneath the removable components.

10 Undercoating

11 The underside of the body will be protected by a high quality automotive undercoating. During
12 this application, special care shall be taken to avoid spraying the product on air lines, cables, or
13 other items that would cause normal maintenance to be hindered.

14 Metal finish

15 All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily
16 chrome plated.

17 Touch Up Paint

18 One bottle of acrylic enamel touch-up paint or two touch up paint pens shall be supplied.

19 Gold Leaf

20 There shall be up to forty 22KT gold leaf letters provided and installed on the apparatus. The
21 letters shall be approximately 4" tall with black outline and shadow.

22 There shall be two 22KT gold leaf town seals provided and installed on the apparatus. The
23 Town seal design will be provided by the Department, and will be 10" in diameter. The seal will
24 be two-tone gold leaf and black.

25 Reflective Stripe

26 Retro-reflective striping shall be applied to the exterior of the apparatus in a manner consistent
27 with NFPA 1901. It shall consist of a 1", 4", and a 1" wide stripe low across the front of the
28 chassis and along the sides up to the first compartment on each side where it shall transition to
29 a point in the upper compartments where it then shall run level to the back edge of the body.

30 There shall be a 1" gap provided between each of the stripes.

31 The final color of the reflective striping will be determined after award of the bid.

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1 Reflective Door Trim

2 The inside face of all vertically hinged compartment doors and the side edges of all horizontally
3 hinged compartment doors will integrate a retro-reflective finish or material in sufficient
4 quantity to increase visibility of open compartment doors to oncoming motorists.

5 The trim color will be alternating red/fluorescent yellow-green.

6 Rear Chevrons

7 At least 50% of the rear of the apparatus will be finished with retro-reflective chevron striping.

8 The trim color will be alternating red/fluorescent yellow-green.

9 Final chevron design and layout will be agreed on at the pre-build meeting.

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1 Section-7 Equipment

2 Equipment Mounting

3 All equipment mounts will be dealer provided and installed by the dealer prior to delivery. The
4 cost of this equipment mounting shall be included in the bid price. This includes mounting
5 brackets and/or designated storage areas for all Dealer supplied and Department supplied
6 equipment. Net compartment space large enough to contain the noted quantity of equipment,
7 in lieu of actual mounting brackets or storage locations, does not meet the intent of this
8 specification.

9 Dealer Provided Equipment

- 10 • One 24' duo-safety Extension ladder
- 11 • One 14' duo safety roof ladder with roof hooks on either end.
- 12 • One 10' folding ladder
- 13 • Three 10' sections of 6" flexible suction hose
- 14 • One TFT Crossfire Deck Gun W/ portable base. The base will have a single 4" Storz inlet.
- 15 • Two Wheel Chocks

16 Buyer Provided Equipment

17 All equipment not noted above will be buyer provided.

18 Equipment list and preferred locations

19 As some equipment is in the process of specification and bid on its own, separate from this
20 apparatus bid process, final make and model for some equipment may not be known until after
21 award of the bid. Equipment is noted under PREFERRED location. If some adjustments are
22 necessary due to cabinet design and limitations this is permissible, but it is intended to keep
23 that equipment grouped near similar equipment from the preferred location.

24 Cab

25 Cab front

- 26 (1) 4-gas meter
- 27 (1) Bullard thermal imager w/charger
- 28 (1) portable radio w/charger
- 29 (1) cell phone
- 30 (1) Knox key box
- 31 (1) mounted lap top
- 32 (1) mag light w/charger
- 33 (3) mobile radios
- 34 (1) binoculars

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- 1 (1) chimney mirror
- 2 (1) digital camera
- 3 (1) set of gate/building keys
- 4 (1) DOT emergency response guide book
- 5 (1) NIOSH haz-mat guide book
- 6 (1) accountability clip board
- 7 (1) spare accountability components (1-qt bag)
- 8 (1) notepad/pens/etc.
- 9 (1) 3" 3-ring binder
- 10 (1) vehicle paperwork {ie. Insurance card, registration, etc}
- 11 (1) box medical gloves
- 12 (1) box of ear plugs
- 13 (1) roll of toilet paper
- 14 (2) spare safety glasses
- 15 (1) can of bug spray
- 16 (1) hand sanitizer
- 17 (2) class 2 traffic vests
- 18 **Cab rear**
- 19 (2) Streamlight vulcan flashlights w/chargers
- 20 (1) set of married irons
- 21 (4) Twin sized blankets
- 22 (1) pillow
- 23 (1) box of bio bags
- 24 (4) class 2 traffic vests
- 25 **EMS cabinet**
- 26 Various medical equipment
- 27 **Driver's side**
- 28 **Pump compartment, driver**
- 29 (1) 4" hose roll, 20'
- 30 (1) 4" hose roll, 40'
- 31 (1) pump operators chart [10"x12"x3/4"]
- 32 (2) small spanner wrenches
- 33 (2) large spanner wrenches
- 34 (1) stokes basket
- 35 (1) back board
- 36 **Body, driver side front**
- 37 (1) full set of firefighter turnout gear

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- 1 (1) master stream stacked tips
- 2 (1) 1 1/2" double female
- 3 (1) 1 1/2" double male
- 4 (1) 1 1/2" nh female to 1 1/2" npsd male
- 5 (1) 1 1/2" npsd female to 1 1/2" nh male
- 6 (1) 2 1/2" ball valve
- 7 (1) 2 1/2" by (2) 1 1/2" male gated wye
- 8 (1) 2 1/2" double female
- 9 (1) 2 1/2" double male
- 10 (1) 2 1/2" nh by 1 1/2" npsd
- 11 (1) 4" storz to 2 1/2" female
- 12 (1) 4" storz to 2 1/2" male
- 13 (1) 5" to 4" storz
- 14 (1) TFT handline automatic nozzle W/ pistol grip
- 15 (1) NFPA stacked tips hand line nozzle W/ pistol grip
- 16 (1) TFT foam nozzle aerator attachment
- 17 (1) hydrant wrench
- 18 (1) rubber mallet
- 19 (2) hose straps
- 20 (2) 3" hose rolls
- 21 **Body, driver side middle**
- 22 (1) flat head axe
- 23 (1) 36" halligan
- 24 (1) pick head axe
- 25 (1) sledge hammer
- 26 (2) 6' new york hook
- 27 (1) Boston rake
- 28 (1) closet d hook
- 29 (1) forestry rake
- 30 (1) forestry shovel
- 31 (1) "A"-tool
- 32 (1) falcon hood release tool
- 33 (1) short handled square shovel
- 34 (1) bolt cutters
- 35 (2) push brooms
- 36 **Body, driver side middle**
- 37 (1) stihl ms 460 magnum rescue
- 38 (1) gas powered circular cut-off saw

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- 1 (1) 1-qt bar & chain oil
- 2 (1) 1-qt pre-mix 2-stroke fuel
- 3 (1) chainsaw chaps
- 4 (1) chainsaw helmet
- 5 (1) spare cutoff saw blade box [16"x16"x2"]
- 6 (1) Tool box [8"x8"x12"]
- 7 (1) 20-lb dry chemical extinguisher
- 8 (1) 30-lb class- d extinguisher
- 9 (1) 2 ½ gal water extinguisher
- 10 **Body, driver side rear**
- 11 (1) chimney kit (6-gal metal pail with contents)
- 12 **Body, driver side best fit**
- 13 (4) streamlight vulcan flashlights w/chargers
- 14 (4) scott 4.5 air pack-75
- 15 (2) scba masks
- 16 **Officer's side**
- 17 **Pump compartment officer**
- 18 (2) small spanner wrenches
- 19 (2) large spanner wrenches
- 20 (1) 95gpm in-line foam eductor
- 21 **Body, officers side front**
- 22 (1) full set of firefighter turnout gear
- 23 (1) honda eu3000 portable generator w/ light head
- 24 (1) 25' extension cord
- 25 (4) quartz scene lights
- 26 (1) electric ventilation fan
- 27 (1) ventilation fan door bracket
- 28 (1) sump pump
- 29 (2) 1 ½" hose roll
- 30 (1) survivair water vac
- 31 **Body, officer side middle**
- 32 (1) rescue rope and associated equipment [8-cu ft +/-]
- 33 (1) 3-bag airbag system with hoses and controller
- 34 (10) cribbing blocks [4"x4"x24"]
- 35 (10) cribbing blocks [2"x4"x24"]
- 36 (2) cribbing blocks [6"x6"x24"]
- 37 (2) cribbing pad [5"x34"x24"]

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- 1 (4) cribbing wedge [4"x4"x24"]
- 2 (4) cribbing wedge [4"x4"x12"]
- 3 (2) cold water rescue suits
- 4 (2) coastguard approved life vests
- 5 (1) cold water rescue ropes system [4-cu ft +/-]
- 6 (1) sked
- 7 **Body, officer side rear**
- 8 (1) general storage area for wd-40, duct tape, fire line tape, etc.
- 9 (1) sawzall
- 10 (1) tool box [12"x12"x26"]
- 11 **General**
- 12 **Body, rear**
- 13 (1) 10' folding ladder
- 14 (1) 14' roof ladder
- 15 (1) 24' extension ladder
- 16 (1) 10' pike pole
- 17 (1) 8' pike pole
- 18 (1) hydraulic cutters
- 19 (1) hydraulic spreaders
- 20 (1) hydraulic ram
- 21 (1) 2-head hydraulic pump
- 22 (2) 25' hydraulic lines
- 23 (4) rut struts
- 24 (2) step chocks
- 25 (1) oasis hydrant assist valve
- 26 (1) hydrant kit
- 27 **Body, top**
- 28 (4) 5 gallon pails of foam
- 29 **Best fit**
- 30 (4) 10' flexible suction hose
- 31 (1) 6" Kochek floating strainer
- 32 (7) 30-min 4500 psi scba bottles
- 33 (1) 5 gallon pail of speedy dry
- 34 (handful) oil absorbent pads
- 35 (1) box of smoke detectors
- 36 (1) case of bottled water
- 37 (2) 15' lengths of ½" chain

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- 1 (1) command vest pack
- 2 (1) 1-gallon of bleach
- 3 (1) 30" squeegee
- 4 (2) pulley blocks for winch cable
- 5 (2) 100' utility rope coil
- 6 (1) 1-gal gas can
- 7 (3) salvage covers
- 8 (1) snow shovel
- 9 (2) traffic stop signs
- 10 (1) tft cross fire base
- 11 (10) MUTCD compliant traffic cones
- 12 **Other**
- 13 (2) wheel chocks