

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

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# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section A – Boiler Plate

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### **A-1000 : SCOPE AND GENERAL INFORMATION**

It is the intent of the HOUSTON FIRE DEPARTMENT to secure an emergency apparatus to withstand the continuous use encountered in the emergency service. The apparatus shall be of the latest type, symmetrically proportioned and constructed with due consideration of the load to be sustained.

All parts not specifically mentioned herein, but which are necessary in order to furnish a complete emergency apparatus, shall be furnished and shall conform to the best practices known to the emergency industry.

The apparatus and all major components shall be manufactured in North America. Where the following detailed specifications require specific brand names, model number, dimension or capacities of components such as: axles, brakes, spring suspension, frame, steering gear, drive line, universal joints, engine transmission, alternator, batteries, air brake system, they have been specified for the service because of their reliability/availability of replacement parts on a local basis.

All specifications herein contained are considered as minimum. No exceptions to these minimum standards shall be allowed relating to gauge, alloy, and type of metal, size of compartments, and overall design.

The delivered apparatus shall have a certified G.V.W.R. weight sticker applied to vehicle on delivery to assure the apparatus meets all laws pertaining to the weight carrying capacity of the vehicle.

### **A-1010 : GENERAL CONSTRUCTION AND DESIGN**

The design of the equipment shall be in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements which might cause injury to personnel or equipment. All components shall be designed and protected so that heavy rains or other adverse weather conditions will not interfere with normal servicing or operation.

All oil, hydraulic and air tubing lines, and electrical wiring shall be located in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through frame connector is necessary.

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 personnel will be carried without injury to the apparatus. All dimensions are approximate and subject to a plus or minus 1/4" tolerance.

The following specifications describe minimum requirements for an emergency services vehicle designed for severe duty applications.

The materials specified are considered absolute minimum.

Subletting any part of the fabrication, painting, or finishing of the apparatus will not be acceptable.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **A-1020 : ACCESSIBILITY**

Parts and components shall be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.

Cover plates which must be removed for component adjustment or part removal should be equipped with quick disconnect fasteners or hinged panels.

Drains, filler plugs, grease fittings, hydraulic lines, bleeders, and check points for all components should be located so that they are readily accessible and do not require special tools for proper servicing. Design practices should minimize the number of tools required for maintenance.

## **A-1030 : MATERIALS**

The materials specifications are considered absolute minimum. Materials shall conform to the specifications listed herein. When not specifically listed, materials shall be of the best quality for purpose of commercial practice. Materials shall be free of all defects and imperfections that might affect the serviceability of finished product.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1040 : QUALITY AND WORKMANSHIP**

The manufacturing process, including quality control, shall be consistent with present industry standards. All equipment, material, and articles required under these specifications are to be new or fabricated from new materials produced from recovered materials. The term "Recovered Materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this document. The term "Heavy Duty", as used to describe an item, shall mean in excess of the standard, quantity, quality, or capacity and represents the best, most durable, strongest, etc., part, component, HOUSTON FIRE DEPARTMENT system, etc., that is available. The HOUSTON FIRE DEPARTMENT or their designate shall be the sole judge of quality, construction and stability of the apparatus and equipment being offered.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the ready removal of any component part for service or repair. All steel and stainless steel welding shall be done to American Welding Society D1.1-83 recommendations for structural steel welding. All aluminum welding shall be done to American Welding Society and ANSI D1.2-83 requirements for structural welding of aluminum.

Defective components shall not be furnished. Parts, equipment, and assemblies, which have been repaired or modified to overcome deficiencies, shall not be furnished without the approval of the HOUSTON FIRE DEPARTMENT. Welded, bolted, and riveted construction utilized shall be in accordance with the highest standards of the industry. Component parts and units shall be manufactured to definite standard dimensions with proper fits, clearances, and uniformity. General appearance of the vehicle shall not show any evidence of poor quality of work.

#### **A-1050 : LIABILITY INSURANCE**

The Body Manufacturer shall furnish with the proposal a certificate of insurance for;

Workman's Compensation and Employer's Liability Insurance covering all employees.

General Liability each occurrence of \$1,000,000.00, General Aggregate of \$2,000,000.00 including Products Completed / Operations Aggregate.

Personal Injury of \$1,000,000.00, Fire damage of \$50,000.00 and Medical expense of \$10,000.00. Automobile liability of \$1,000,000.00 combined single limit (each accident), including any auto, all owned autos, scheduled autos, hired autos, non-owned autos, and garage liability.

Excess Umbrella Liability coverage of \$2,000,000.00 each occurrence, Aggregate of \$2,000,000.00.

All insurance policies must be;

- Maintained for the life of the contract,
- Must provide ten (10) days notice before cancellation,
- Must cover all operations of the contractor, or anyone employed by them.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1060 : INTERNET IN-PROCESS SITE**

The Body Manufacturer shall post and maintain a website where the HOUSTON FIRE DEPARTMENT will be able to view digital images of their apparatus as its being manufactured. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of the apparatus.

#### **A-1070 : ONSITE DEMONSTRATIONS OF COMPLETED APPARATUS**

There will be two (2) of the Body Manufacturer's factory technicians sent to the HOUSTON FIRE DEPARTMENT training location for a period of twenty (20) days for on-site training of the entire apparatus.

Delivery / Demo / and Training Schedule to Following:

▪ Mechanical :	(1) Day
▪ Tech Maintenance/Radio:	(1) Day
▪ IT Training	(2) Days
▪ Operator Training	(4) Days
▪ Testing	(2) Days
▪ Shift Commander Training	(1) Day
▪ Staff Training	(2) Days
▪ Overall Orientation	(3) Days
▪ Dispatcher Training	<u>(4) Days</u>
<b>Total</b>	<b>20 Days</b>

#### **A-1080 : RESPONSIBILITY OF PURCHASER**

It shall be the responsibility of the purchaser to specify the following details of the apparatus:

- (1) Its required performance, including where operations at elevations above 2000 ft (600 m) or on grades greater than 6 percent are required
- (2) The maximum number of fire fighters to ride within the apparatus
- (3) Specific electrical loads that are to be part of the minimum continuous electrical load defined in 13.3.3
- (4) Any hose, ground ladders, or equipment to be carried by the apparatus that exceed the minimum requirements of this standard
- (5) If a trailer for the purpose of transporting fire rescue response equipment, whether it is a Type I, Type II, or Type III configuration

After acceptance of the fire apparatus, the purchaser shall be responsible for ongoing training of personnel to develop and maintain proficiency regarding the proper and safe use of the apparatus and the associated equipment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1090 : RESPONSIBILITY OF CONTRACTOR**

The contractor shall provide a detailed description of the apparatus, a list of equipment to be furnished, and other construction and performance details to which the apparatus shall conform.

The detailed description of the apparatus shall include, but shall not be limited to, estimated in-service weight, wheelbase, turning clearance radius, principal dimensions, angle of approach, angle of departure, transmission, and axle ratios.

The contractor's detailed description shall include a statement specifically describing each aspect of the delivered apparatus that will not be fully compliant with the requirements of this standard.

The purpose of these contractor specifications shall be to define what the contractor intends to furnish and deliver to the purchaser.

Responsibility for the apparatus and equipment shall remain with the contractor until they are accepted by the purchaser.

#### **A-1100 : VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS**

The cab/chassis shall be equipped with a stability control system. The system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

#### **A-1110 : CONSTRUCTION DOCUMENTATION**

The contractor shall supply, at the time of delivery, at least one (1) copy of the following documents:

- (1) The manufacturers record of apparatus construction details, including the following information:
  - (a) Owner's name and address
  - (b) Apparatus manufacturer, model, and serial number
  - (c) Chassis make, model, and serial number
  - (d) GAWR of front and rear axles and GVWR
  - (e) Front tire size and total rated capacity in pounds (kilograms)
  - (f) Rear tire size and total rated capacity in pounds (kilograms)
  - (g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
  - (h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
  - (i) Type of fuel and fuel tank capacity
  - (j) Electrical system voltage and alternator output in amps
  - (k) Battery make, model, and capacity in cold cranking amps (CCA)
  - (l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - (m) Ratios of all driving axles
  - (n) Maximum governed road speed
  - (o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
  - (p) Pump transmission make, model, serial number, and gear ratio

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

- (q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
- (r) Water and Foam tank certified capacity in gallons or liters
- (s) Paint manufacturer and paint number(s)
- (t) Company name and signature of responsible company representative
- (u) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- (2) Certification of compliance of the optical warning system
- (3) Siren manufacturer's certification of the siren
- (4) Written load analysis and results of the electrical system performance tests
- (5) Certification of slip resistance of all stepping, standing, and walking surfaces
- (6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability
- (7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions
- (8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications
- (9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
- (10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test
- (11) If the apparatus has a fire pump, the certification of inspection and test for the fire pump
- (12) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test
- (13) When the apparatus is equipped with a water tank, the certification of water tank capacity
- (14) If the apparatus has an aerial device, the certification of inspection and test for the aerial device
- (15) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification the foam proportioning system meets this standard
- (16) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
- (17) If the apparatus has a line voltage power source, the certification of the test for the power source
- (18) If the apparatus is equipped with an air system, air tank certificates, the SCBA fill station certification (see 24.9.7), and the results of the testing of the air system installation
- (19) Any other required manufacturer test data or reports

#### **A-1120 : OPERATIONS AND SERVICE DOCUMENTATION**

The contractor shall deliver with the fire apparatus at least two (2) sets of complete operation and service documentation covering the completed apparatus as delivered and accepted.

The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

The contractor shall also deliver with the fire apparatus the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

- (1) Manufacturer's name and address
- (2) Country of manufacture
- (3) Source for service and technical information
- (4) Parts replacement information
- (5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

- (6) Wiring diagrams for low voltage and line voltage systems to include the following information:
  - (a) Pictorial representations of circuit logic for all electrical components and wiring
  - (b) Circuit identification
  - (c) Connector pin identification
  - (d) Zone location of electrical components
  - (e) Safety interlocks
  - (f) Alternator–battery power distribution circuits
  - (g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
- (7) Lubrication charts
- (8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
- (9) Precautions related to multiple configurations of aerial devices, if applicable
- (10) Instructions regarding the frequency and procedure for recommended maintenance
- (11) Overall apparatus operating instructions
- (12) Safety considerations
- (13) Limitations of use
- (14) Inspection procedures
- (15) Recommended service procedures
- (16) Troubleshooting guide
- (17) Apparatus body, chassis, and other component manufacturer's warranties
- (18) Special data required by this standard
- (19) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

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

#### **A-1130 : NFPA REQUIRED DOCUMENTATION FORMAT - CD-ROM**

The vehicle construction details and the operations and service documentation as required per NFPA 1901 latest edition shall be provided on a CD-ROM. These manuals shall be divided into sections for ease of reference. There shall be two (2) copies of the CD-ROM provided with the completed vehicle.

#### **A-1140 : TECH RACK WIRING DIAGRAM**

The Body Manufacturer will supply a wiring diagram that includes the components in each of the data racks and identifies the individual power sources.

#### **A-1150: EXTENSIVE 12 VOLT/120VOLT WIRING DIAGRAM**

The Body Manufacturer will supply a wiring diagram with the floor plan of the apparatus to identify 12 volt and 120 volt routing.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1160 : CARRYING CAPACITY**

The GAWR and the GCWR or GVWR of the chassis shall be adequate to carry the weight of the completed vehicle when loaded to its estimated in-service weight. The manufacturer shall establish the estimated in service weight during the design of the vehicle

The estimated in-service weight shall include the following:

- (1) The chassis, body, and tank(s)
- (2) Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
- (3) Full water and other agent tanks
- (4) \*250 lb (114 kg) in each seating position
- (5) Fixed equipment such as pumps, aerial devices, generators, reels, and air systems as installed
- (6) Ground ladders, suction hose, designed hose load in their hose beds and on their reels
- (7) An allowance for miscellaneous equipment that is the greatest of the values for type of vehicle per NFPA 1901, a purchaser provided list of equipment to be carried with weights, or a purchaser specified miscellaneous equipment allowance.

The manufacturer shall engineer and design the vehicle such that the completed unit, when loaded to its estimated in-service weight, with all movable weights distributed as close as is practical to their intended in-service configuration, does not exceed the GVWR.

A final manufacturer's certification of the GVWR or GCWR, along with a certification of each GAWR, shall be supplied on a label affixed to the vehicle.

<b>Apparatus Type</b>	<b>Equipt. Storage Area</b>	<b>Apparatus Size</b>	<b>Equipment Allowance</b>	
			<b>lb.</b>	<b>kg.</b>
Special Service Fire Apparatus	Minimum of 120 cu ft (3.4 cu mt) of enclosed compartmentation.	10,000 lb to 15,000 lb (4,500 kg to 7,000 kg) GVWR	2,000	910
		15,001 lb to 20,000 lb (7,001 kg to 9,000 kg) GVWR	2,500	1,135
		20,001 lb to 30,000 lb (9,001 kg to 14,000 kg) GVWR	3,000	1,350
		30,001 lb to 40,000 lb (14,001 kg to 18,000 kg) GVWR	4,000	1,800
		40,001 lb to 50,000 lb (18,001 kg to 23,000 kg) GVWR	6,000	2,700
		50,001 lb to 60,000 lb (23,001 kg to 27,000 kg) GVWR	8,000	3,600
		60,001 lb and up (27,001 kg) GVWR	10,000	4,500

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **A-1170 : TESTING**

##### **A-1180 : LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (-18°C and 43°C).

##### **A-1190 : TEST SEQUENCE**

The following three (3) tests shall be performed in the order in which they appear below. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. Failure of any of these tests shall require a repeat of the sequence.

##### **A-1200 : (1) RESERVE CAPACITY TEST**

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off, and the minimum continuous electrical load shall be activated for 10 minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

##### **A-1210 : (2) ALTERNATOR PERFORMANCE TEST**

##### **A-1220 : TEST AT IDLE**

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

##### **A-1230 : TEST AT FULL LOAD**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the warning system required in 13.3.4, or a system voltage of less than 11.8 V dc for a 12 V nominal system, 23.6 V dc for a 24 V nominal system, or 35.4 V dc for a 42 V nominal system for more than 120 seconds shall be considered a test failure.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1240 : (3) LOW VOLTAGE ALARM TEST**

The following test shall be started with the engine off and the battery voltage at or above 12 V for a 12 V nominal system, 24 V for a 24 V nominal system, or 36 V for a 42 V nominal system.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm does not sound in less than 140 seconds after the voltage drops to 11.70 V for a 12 V nominal system, 23.4 V dc for a 24 V nominal system, or 35.1 V for a 42 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

#### **A-1250 : DOCUMENTATION**

The manufacturer shall deliver the following with the fire apparatus:

- (1) Documentation of the electrical system performance tests
- (2) A written electrical load analysis, including the following:
  - (a) The nameplate rating of the alternator
  - (b) The alternator rating
  - (c) Each of the component loads specified that make up the minimum continuous electrical load
  - (d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load
  - (e) Each individual intermittent electrical load.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### A-1260 : UL 120/240 VAC CERTIFICATION

The 120/240 volt electrical system shall be tested and certified by Underwriters Laboratories, to perform as listed below;

The prime mover shall be started from a cold start condition, and the unloaded voltage and frequency shall be recorded.

The line voltage electrical system shall be loaded to at least 100 percent of the continuous rated wattage stated on the power source specification label. Testing with a resistive load bank shall be permitted.

The power source shall be operated in the manner specified by the apparatus manufacturer as documented on instruction plates or in operation manuals. The power source shall be operated at a minimum of 100 percent of the continuous rated wattage as stated on the power source specification label for a minimum of 2 hours.

The load shall be adjusted to maintain the output wattage at or above the continuous rated wattage during the entire 2-hour test.

The following conditions shall be recorded at least every 1.2 hour during the test:

- (1) The power source output voltage, frequency, and amperes
- (2) The prime mover's oil pressure, water temperature, and transmission temperature, if applicable
- (3) The power source hydraulic fluid temperature, if applicable
- (4) The ambient temperature and power source air inlet temperature

The following conditions shall be recorded once during the test for power sources driven by dedicated auxiliary internal combustion engines:

- (1) Altitude
- (2) Barometric pressure
- (3) Relative humidity

If the generator is driven by the chassis engine and the generator allows for operation at variable speeds, the chassis engine speed shall be reduced to the lowest rpm allowed for generator operation and the voltage and frequency shall be recorded.

The load shall be removed, and the unloaded voltage and frequency shall be recorded.

Voltage shall be maintained within  $\pm 10$  percent of the voltage stated on the power source specification label during the entire test. Frequency shall be maintained within  $\pm 3$  Hz of the frequency stated on the power source specification label during the entire test.

The total continuous electrical loads, excluding those loads associated with the equipment defined in 22.15.7.3.11.2, shall be applied during the testing unless an auxiliary engine drives the power source.

If the apparatus is equipped with a fire pump, the 2-hour certification test of the power source shall be completed with the fire pump pumping at 100 percent capacity at 150 psi (1000 kPa) net pump pressure. The test shall be permitted to be run concurrently with the pump certification test.

The results of each test shall be recorded on an appropriate form and provided with the delivery of the fire apparatus.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **A-1270 : DIELECTRIC VOLTAGE WITHSTAND TEST**

The line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for 1 minute. The testing shall be performed after all body work has been completed.

The test shall be conducted as follows:

- (1) Isolate the power source from the panel board and disconnect any solid state low voltage components.
- (2) Connect one lead of the dielectric tester to all the hot and neutral buses tied together.
- (3) Connect the other lead to the fire apparatus frame or body.
- (4) Close any switches and circuit breakers in the circuit(s).
- (5) Apply the dielectric voltage for 1 minute in accordance with the testing equipment manufacturer's instructions.

The electrical polarity of all permanently wired equipment, cord reels, and receptacles shall be tested to verify that wiring connections have been properly made.

Electrical continuity shall be verified from the chassis or body to all line voltage electrical enclosures, light housings, motor housings, light poles, switch boxes, and receptacle ground connections that are accessible to fire fighters in normal operations.

If the apparatus is equipped with a transfer switch, it shall be tested to verify operation and that all non grounded conductors are switched.

Electrical light towers, floodlights, motors, fixed appliances, and portable generators shall be operated at their full rating or capacity for 30 minutes to ensure proper operation.

#### **A-1280 : GENERAL LIMITED WARRANTY - ONE (1) YEAR**

The vehicle shall be free of defects in material and workmanship for a period of one (1) year or 12,000 miles, whichever occurs first starting thirty (30) days after the original invoice date.

The contractor must be the "single source" coordinator of all warranties on the vehicle.

#### **A-1290 : LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS**

The vehicle low voltage electrical system shall be free of defects in material and workmanship for a period of five (5) years or 60,000 miles, whichever occurs first, starting thirty (30) days after the original invoice date.

#### **A-1300 : STRUCTURAL WARRANTY - TEN (10) YEARS**

The body shall be free of structural or design failure or workmanship for a period of ten (10) years, or 100,000 miles whichever occurs first, starting thirty (30) days after the original invoice date.

#### **A-1310 : PAINT LIMITED WARRANTY - TEN (10) YEARS**

The body shall be free of bubbling, or peeling as a result of a defect in the method of manufacture for a period of ten (10) years, or 100,000 miles whichever occurs first, starting thirty (30) days after the original invoice date.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **A-1320 : CONSTRUCTION PERIOD**

The completed vehicle shall be delivered within three hundred seventy five (375) days after receipt of a purchase order, or contract.

Contractor shall not be held liable for delays of chassis delivery due to accidents, strikes, floods or other events not subject to their control. Contractor shall provide immediate written notice to HOUSTON FIRE DEPARTMENT as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

## **A-1330; \$100.00 PER CALENDAR DAY PENALTY CLAUSE**

The Body Manufacturer shall be responsible to deliver the completed vehicle within the specified construction period. Failure to do so will result in a \$100.00 per calendar day deduction in the purchase amount.

## **A-1340 : OVERALL HEIGHT**

The overall height (OAH) of the vehicle shall be approximately 144" (12') from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

## **A-1350 : OVERALL LENGTH**

The overall length (OAL) of the vehicle shall be approximately 501" ( 41' - 8" ).

# HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION

## Section B – Inspections and Trips

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### **B-1000 : INSPECTION TRIPS**

There will be a pre-construction meeting, a pre-paint meeting and a final inspection meeting of the specified apparatus at the Body Manufacturer's factory. The HOUSTON FIRE DEPARTMENT will decide on the number of Fire Department representatives will attend each meeting. The HOUSTON FIRE DEPARTMENT will be responsible for all expenses incurred including transportation, lodging and food of all HOUSTON FIRE DEPARTMENT representatives.

### **B-1010 : DELIVERY AND DEMONSTRATION**

The contractor shall be responsible for the delivery of the completed unit to the HOUSTON FIRE DEPARTMENTs location. On initial delivery of the apparatus, the contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the HOUSTON FIRE DEPARTMENT regarding the operation, care, and maintenance of the apparatus and equipment supplied at the HOUSTON FIRE DEPARTMENTs location.

The completed apparatus will be delivered under its own power to the Fire Department upon completion.

The delivery engineer shall set delivery and instruction schedule with the person appointed by HOUSTON FIRE DEPARTMENT.

After delivery of the apparatus, the HOUSTON FIRE DEPARTMENT shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment as defined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, and NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section C – Spartan

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#### **C-1000 : MODEL**

The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. This chassis shall be manufactured for heavy duty service with strength and capacity for a duty rating of one hundred (100) percent loaded full time.

#### **C-1010 : MODEL YEAR**

The chassis shall have a vehicle identification number that reflects a 2009 model year.

#### **C-1020 : COUNTRY OF SERVICE**

The chassis shall be put in service in the country of United States of America (USA).

#### **C-1030 : APPARATUS TYPE**

The apparatus shall be a rescue vehicle designed for emergency service use which shall include the functions of a multipurpose vehicle which primarily provides support services at emergency scenes.

#### **C-1040 : VEHICLE TYPE**

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

#### **C-1050 : AXLE CONFIGURATION**

The chassis shall feature a 6 X 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

#### **C-1060 : GROSS AXLE WEIGHT RATINGS FRONT**

The front gross axle weight rating (GAWR) of the chassis shall be 23,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

#### **C-1070 : GROSS AXLE WEIGHT RATINGS REAR**

The rear gross axle weight rating (GAWR) of the chassis shall be 40,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1080 : CAB STYLE**

The cab shall be a custom, enclosed model, built specifically for the fire service by a company specializing in cab and chassis design for all fire service applications.

The cab shall be manufactured for heavy-duty service utilizing adequate strength and capacity for the application of protecting firefighters. The cab shall be of a modular design offering improved strength, durability and reduced weight. The modular design shall allow for faster, less costly replacement of components. Per pound, sheet panel aluminum extrusions offer a higher tensile strength, 45,000 PSI, and yield strength, 40,000 PSI, than that of lower grade sheet such as 3003-H13. For this reason, the cab shall be of aluminum extrusion construction, which shall offer superior strength and the truest, flattest surface ensuring less expensive paint repairs if needed.

The method of cab construction shall use a process incorporating techniques outlined in accordance with the American Welding Society D1.1-96 requirements for structural steel welding. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side panels shall be assembled using proven industrial adhesives, designed specifically for aluminum fabrication, which exceed the strength of a weld, for construction.

All interior and exterior seams shall be sealed for optimum noise reduction in addition to the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 Marine Grade, one hundred percent primary aluminum plate. A single formed, one (1) piece extrusion, manufactured from 6061-T6 100 percent primary one- quarter inch thick aluminum shall be used for the "A" pillar adding strength and rigidity to the cab as well as additional roll-over protection. The cab side wall skins and shall be 0.125 inch thick, the rear wall and roof skin shall be 0.19 inch thick, the front skin shall be 0.125 inch thick.

The cab shall incorporate tongue and groove fitted 6061-T6 0.25 inch thick aluminum extrusions for extreme duty situations. The cab shall include multi-layer composite insulation for improved cab heating and cooling in addition to noise reduction.

Proposals offering products built with anything less than the alloy-temper mentioned or from any other material, other than aluminum, shall not be considered. Additionally, any cabs utilizing recycled or recovered aluminum plate or extrusion products shall not be considered due to impurities in the composition leading to a lack of strength.

The cab shall incorporate a fully enclosed design, allowing for a spacious cab area with no partition between the front and rear sections of the cab. The walls of the vehicle shall include roof supports allowing for an open design. The outside dimension of the cab shall be 96 inches wide with a minimum interior width of 90 inches.

The cab overall length shall be 109.38 inches in length with 33.00 inches from the centerline of the front of the axle to the back of the cab. The cab shall offer an interior height of 58.00 inches from the front floor to the headliner, at a minimum. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

In order to offer the optimum amount of cab space to occupants, there shall be no consideration given for any cab unable to comply with the minimum measurements for interior cab space as listed.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

The cab shall include a driver and officer area with two (2) cab door openings. The front door opening shall offer a clear door opening of 43.00 inches wide X 56.00 inches high. This style shall not include any crew area.

The cab shall incorporate a (2) step configuration from the ground to the cab floor for each door opening. The lower step shall be constructed of heavy duty safety grating which meets or exceeds Federal Specification RRG-1602-latest revision and performs under dry, greasy, muddy, soapy and icy conditions and offers open drainage.

The first step for the driver and officer area shall measure 11.44 inches deep X 31.13 inches wide. The intermediate step shall measure 8.75 inches deep X 33.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

#### **C-1090 : CAB FRONT FASCIA**

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.090 of an inch thick, one hundred percent primary aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

#### **C-1100 : FRONT GRILLE**

The front cab fascia shall include a classic box style, 304 stainless steel front grille with a Spartan logo. The grille shall measure 44.45 inches wide at the top of tapering to 39.30 inches wide at the bottom X 33.50 inches high X 1.50 inches deep.

The grille shall include a minimum free air intake of 632.90 square inches shall be installed on the front of the cab.

The upper portion of the grille shall be hinged at the bottom so it can be opened to allow easy access for examination of the windshield wiper motor, linkage and other options mounted within that area. The upper portion of the grille shall be secured with two (2) flush push button latches.

#### **C-1110 : CAB ENGINE TUNNEL**

The cab interior shall include a fixed type engine tunnel cover sized to accommodate an engine with a smaller block or an engine which has a large block. The engine tunnel shall be an integral part of the cab constructed of 5052-H32 Marine Grade, .190 of an inch thick, one hundred percent primary aluminum plate. The tunnel shall be a maximum of 41.50 inches wide X 29.00 inches high.

The engine tunnel shall be insulated with multi-layer insulating material, consisting of foam, a sound barrier of 1.0 pounds per square foot with a facing which resists heat transfer. This insulation shall be held in place by adhesive, aluminum stick pins and retention caps. Any exposed insulation seams and edges shall be sealed reducing moisture and debris.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1120 : CAB ENTRY DOORS**

The cab shall include a driver and officer area with two cab door openings which offer a clear door opening of 40.75 inches wide. The doors shall be constructed of extruded aluminum with a nominal thickness of .125 inch. The exterior skins shall be constructed of .125 inch aluminum plate.

The cab doors shall be of substantial weight for the optimum strength and rigidity for the best performance in all cab crash testing. Any cab with doors manufactured of less than the material thickness of .125 inch in both the extrusion and exterior skin shall not be considered.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each hinge shall be .375 inch piano style and be constructed of stainless steel.

The hidden piano style hinge and flush mounted door is the most favorable construction keeping dirt and debris out of the hinge allowing for optimum operation throughout the lifetime of the door.

Proposals offering door hinge thickness any less than stated shall not be considered.

Proposals including doors that do not comply with the flush mounting as described or those including exposed hinges shall not be considered.

#### **C-1130 : CAB ENTRY DOOR TYPE**

All entry doors shall be of a flush, full height design and shall be located on the sides of the cab.

#### **C-1140 : LH EXTERIOR REAR COMPARTMENT**

The cab shall offer an exterior compartment on the left side of the cab behind the door. The compartment interior dimensions shall be 30.00 inches wide X 51.88 inches high and shall be transverse from side to side of the cab. The compartment shall include a locking ROM roll up door. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

#### **C-1150 : LH EXTERIOR REAR COMPARTMENT LIGHTING**

The cab shall include a On Scene Solution LED Night Stik and will be mounted to the left hand side of the left hand exterior compartment. The lights shall include a polycarbonate lens and housing. The electronics shall be Epoxy encapsulated to protect the lamp from damage caused by chemicals and moisture.

#### **C-1160 : LH EXTERIOR COMPARTMENT INTERIOR FINISH**

The interior of the left hand exterior compartment shall have a DA sanded finish.

#### **C-1170 : RH EXTERIOR REAR COMPARTMENT**

The cab shall offer an exterior compartment on the right side of the cab behind the door. The compartment interior dimensions shall be 30.00 inches wide X 51.88 inches high and shall be transverse from side to side of the cab. The compartment shall include a locking ROM roll up door. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **C-1180 : RH EXTERIOR REAR COMPARTMENT LIGHTING**

The cab shall include a On Scene Solution LED Night Stik and will be mounted to the right hand side of the right hand exterior compartment. The lights shall include a polycarbonate lens and housing. The electronics shall be Epoxy encapsulated to protect the lamp from damage caused by chemicals and moisture.

## **C-1190 : RH EXTERIOR COMPARTMENT INTERIOR FINISH**

The interior of the right hand exterior compartment shall have a DA sanded finish.

## **C-1200 : CAB STRUCTURAL WARRANTY**

The cab structure shall be warranted for a period of ten (10) years. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

## **C-1210 : CAB TEST INFORMATION**

The cab shall have successfully achieved survival of the International crash test ECE-29, Addendum 28, Revision 1 as indicated below.

As part of the ECE regulation 29 test, the frontal area of the cab is struck by a 3,700 pound pendulum weight. The weight is brought back to a sixty degree angle and then the weight is released and allowed to swing forward, imparting some 32,600 lbs/ft of force to the cab front face.

The cab shall be so constructed that after the test, there will be minimal intrusion of the cab structure into the passenger area. The doors shall remain usable for both entry and exit. Also, as part of the test the cab roof must withstand a static load bearing test. The cab shall withstand a weight of over 60,000 pounds without permanent damage or collapse.

The above tests shall be witnessed by and attested to by an independent third party. The test results shall be recorded on/by cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1220 : CAB PAINT EXTERIOR**

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper, the seams shall be sealed with SEM brand seam sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The cab shall then be painted with the specific color designated by the customer with a minimum thickness of 2.00 mils of paint, followed by a clear top coat not to exceed 2.00 mils.

#### **C-1230 : CAB PAINT MANUFACTURER**

The cab shall be painted with PPG Industries paint.

#### **C-1240 : CAB PAINT PRIMARY/LOWER COLOR**

The primary/lower paint color shall be PPG FBCH 911645 White.

#### **C-1250 : CAB PAINT WARRANTY**

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for 10 years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

#### **C-1260 : ELECTRICAL SYSTEM**

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon brand of multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

#### **C-1270 : APPARATUS WIRING PROVISION**

An apparatus wiring panel shall be installed on the officer side bulkhead below the dash which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15 amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1280 : MULTIPLEX DISPLAY**

The multiplex electrical system shall include a Weldon Vista III display which shall be located on the left side of the dash in the switch panel. The Vista III shall feature a full color LCD display screen which includes a message bar displaying the time of day, the current ambient outside temperature and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be virtual controls for the auto climate control and on-board diagnostics. The display screen shall be video ready for back- up cameras, thermal cameras, and DVD.

The Vista III display shall measure approximately 10.38 inches wide X 7.50 inches overall. The display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

#### **C-1290 : VEHICLE DATA RECORDER**

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

#### **C-1300 : POWER & GROUND STUD**

A 40 amp battery direct power and ground stud shall be provided and installed in the electrical distribution panel. The stud shall be size #10 and protected with a 40 amp circuit breaker.

#### **C-1310 : AUXILIARY POWER & GROUND STUD**

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40 amp breaker. The studs shall be .375 inch diameter and capable of carrying up to a 40 amp load switched with the master power switch.

#### **C-1320 : EXTERIOR ELECTRICAL TERMINAL COATING**

All terminals exposed to the elements will be sprayed with a yellow protective rubberized coating to prevent corrosion.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1330 : ENGINE**

The power plant for the vehicle shall offer a high pressure performance, turbo charged engine which shall feature a high pressure common rail fuel system. This system shall be coupled with a proven Holset turbo which delivers outstanding performance at ratings up to 500 HP. The Cummins ISM engine shall include replaceable mid-stop cylinder liners plus heavy duty roller followers, targeted piston cooling and 30% more efficient oil cooling for improved durability and reliability. The heavy duty design shall also feature stronger braking capacity.

The engine shall be EPA certified to meet the very latest emissions standards without compromising performance, reliability or durability. The Cummins ISM 500 engine shall feature an air charge cooled engine which consists of an in line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 500 horse power at 2000 RPM which shall be governed at 2100 RPM. The torque rating shall feature 1550 foot pounds of torque at 1200 RPM with 661 cubic inches of displacement. The Cummins ISM 500 engine shall feature an electronic governor.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

#### **C-1340 : ENGINE PROGRAMMING HIGH IDLE SPEED**

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

#### **C-1350 : ENGINE HIGH IDLE CONTROL**

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indication on the Vista screen for the high idle speed control.

#### **C-1360 : ENGINE PROGRAMMING ROAD SPEED GOVERNOR**

The engine shall include programming which will govern the top speed of the vehicle.

#### **C-1370 : AUXILIARY ENGINE BRAKE**

A Jacobs engine compression brake, for the six (6) cylinder engine shall be provided. The engine compression brake shall actuate the vehicle's brake lights when engaged. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine brake shall activate upon 0% accelerator when in operation mode.



# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1380 : AUXILIARY ENGINE BRAKE CONTROL**

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected: a valid gear ratio is detected; the driver has requested or enabled engine compression brake operation; the throttle is at a minimum engine speed position; and the electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. The compression brake shall be controlled via an off/low/high virtual button through the Vista display.

#### **C-1390 : FLUID FILLS**

The front of the chassis shall accommodate fluid fills for the engine oil and the windshield washer fluid though the grille. This area shall also accommodate checks for the engine oil.

#### **C-1400 : ELECTRONIC ENGINE OIL LEVEL INDICATOR**

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

#### **C-1410 : ENGINE WARRANTY**

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

#### **C-1420 : ENGINE PROGRAMMING REMOTE THROTTLE**

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

#### **C-1430 : ENGINE PROGRAMMING IDLE SPEED**

The engine low idle speed will be programmed at 700 rpm.

#### **C-1440 : ENGINE FAN DRIVE**

The engine cooling system fan shall be direct drive belt driven on the engine.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1450 : ENGINE COOLING SYSTEM**

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the fire industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall utilize heavy-duty welds and be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a stacked, single depth package that provides the maximum cooling capacity for the specified engine as well as offers excellent serviceability. The main components shall include a surge tank, a charge air cooler, a recirculation shield, and a radiator.

There shall be a single depth core that allows greater efficiency, enhanced serviceability, and lighter weight with a higher ambient capability.

The cooling package core shall be protected by a radiator skid plate and not protrude below the frame of the vehicle by more than 3.5 inches. This feature shall provide an improved angle of approach thereby reducing possible damage.

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall include a minimum of a 910 square inch core and 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 cooling system shall include a one piece injected molded Polymer fan blade designed to provide long life in harsh environments. Polymer fans provide a significant weight reduction over metal fans providing longer life for fan clutch linings and bearings along with increased fan belt life.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a cap that meets the engine manufacturer's pressure requirements as well as the system design requirements.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance. When a center bumper compartment is installed an additional shield may be required to redirect the airflow into the coolers.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with welded side tanks. The charge air cooler shall have a minimum of a 473 square inch core and be bolted to the top of the radiator to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1460 : ENGINE COOLANT**

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees F.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

#### **C-1470 : ENGINE COOLANT FILTER**

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

#### **C-1480 : ELECTRONIC COOLANT LEVEL INDICATOR**

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

#### **C-1490 : COOLANT HOSES**

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

#### **C-1500 : ENGINE COOLANT OVERFLOW BOTTLE**

A remote overflow bottle shall be provided in the case of over filling the coolant system; this is usually done to locate the expansion fluid in the overflow bottle rather than on the ground. The overflow bottle that is used on the system will only be a catch bottle and will not return coolant back to the surge tank. The system is designed with a single seal cap and does not allow the coolant to return to the surge tank.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1510 : ENGINE AIR INTAKE**

The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the officer side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a galvanized steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the officer side. The completely disposable dry type filter shall ensure containment of dust and debris safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter cone pack, which shall result in increased capacity and lower pressure differential for improved horsepower and fuel economy. The air intake shall be mounted within easy access via a hinged panel behind the headlight module. The air intake system shall include a restriction indicator light in the warning light cluster which shall activate when the air cleaner element requires replacement.

The charge air cooler hose shall be formed from aluminized steel tubing and include silicone hump hose with stainless expansion rings and stainless steel "constant torque" style clamps meeting the engine manufactures requirements.

Proposals shall include an indication light representative of the need for replacement of the air intake filter and shall be located at the front of the vehicle.

#### **C-1520 : AIR INTAKE SKIDPLATE**

A skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall be bolted to the bottom flange of the right side frame rail to provide additional protection for the air intake system.

#### **C-1530 : ENGINE EXHAUST SYSTEM**

The exhaust system shall be installed under the frame and shall terminate horizontally on the driver side of the vehicle ahead of the rear tires. A muffler and 0.065 wall aluminized steel exhaust tubing shall be installed. The tubing shall be supported by brackets which are bolted to the frame for strength and rigidity. Stainless steel flex tubing shall be installed between exhaust pipe and the muffler system. Any joints throughout the system shall be connected with overlapping band style clamps.

#### **C-1540 : ENGINE EXHAUST ACCESSORIES**

A radiused chrome exhaust tail pipe extension shall be shipped loose with the chassis for installation by the apparatus builder.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1550 : TRANSMISSION**

The drive train shall include an Allison Gen IV-E model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The Gen IV-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

The transmission gear ratios shall be:

1<sup>st</sup> - 3.51:1  
2<sup>nd</sup> - 1.91:1  
3<sup>rd</sup> - 1.43:1  
4<sup>th</sup> - 1.00:1  
5<sup>th</sup> - 0.74:1  
6<sup>th</sup> - 0.64:1 (if applicable)  
Rev- 4.80:1

#### **C-1560 : TRANSMISSION MODE PROGRAMMING**

The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button.

#### **C-1570 : TRANSMISSION FEATURE PROGRAMMING**

The EVS group package number 127 shall contain the 199 vocational package in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

An 8 pin Delphi connector will be provided next to the steering column connector. This will contain the following input/output circuits to the transmission tcm.

Function ID	Description	Wire assignment
C	PTO Request	143
F	Aux. Function Range Inhibit (Special)	101/142
G	PTO Enable Output (See Input Function C)	130
S	Neutral Indicator for PTO	145
	Signal Return	103

#### **C-1580 : ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR**

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1590 : TRANSMISSION SHIFT SELECTOR**

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector will provide a prognostic indicator (wrench symbol) between the selected and attained indicators.

#### **C-1600 : TRANSMISSION RETARDER CONTROL**

The Allison transmission retarder control shall be modulated by a one-third at 0% throttle and two-thirds brake pedal actuation and shall include a virtual button on the multiplex display. The activation of the retarder shall activate the brake lights and shall be inactive during pump mode.

#### **C-1610 : TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE**

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

#### **C-1620 : TRANSMISSION WARRANTY**

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

#### **C-1630 : TRANSMISSION COOLING SYSTEM**

The transmission shall include an air to oil cooler integrated into the lower portion of cooling package. The transmission cooling system shall meet all transmission manufacturer requirements.

The transmission retarder application shall feature a separate water to oil cooling system. The cooler will be installed into the transmission hydraulic circuit providing cooling for the retarder. The tube bundle cooler shall be mounted to the chassis, connected to the engine cooling system plumbing.

#### **C-1640 : LH PTO**

A Spartan supplied ten (10) bolt standard duty clutched drive PTO shall be installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

#### **C-1650 : LH PTO MODEL**

A ten (10) bolt Chelsea model 277-XMFJP-B5XD heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides torque ranges from 250 to 335 lb. ft.

#### **C-1660 : PTO LOCATION**

The transmission driven power take off (PTO) shall be mounted in the 8:00 o'clock position.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-1670 : PTO CONTROL**

The left hand power take off shall be controlled by the transmission. It will use a virtual switch on vista with text messages. Disable is displayed when switch is off. Enable is displayed when the switch is turned on. Active is displayed when the switch is on with positive engagement of the power take off.

Required operating conditions for enabling this function are:

- Throttle position is low
- Engine speed is within customer modifiable constant limits
- Output speed is within customer modifiable constant limits
- Park brake set

#### **C-1680 : DRIVELINE**

All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. A splined slip joint shall be provided in each driveshaft and shall be coated with Glide coat®.

#### **C-1690 : FUEL FILTER/WATER SEPARATOR**

The fuel system shall have a Racor B32001 fuel filter/water separator as a primary filter. The fuel filter shall have a see through cover to allow visual inspection of fuel and filter condition and a drain valve.

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

#### **C-1700 : FUEL LINES**

The fuel system lines shall be black textile braid covered high tensile steel reinforced wire braided supply and return hoses with steel reusable fittings installed from the tank to engine.

#### **C-1710 : FUEL SHUTOFF VALVE**

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

#### **C-1720 : ELECTRIC FUEL PRIMER**

A Facet brand electric fuel primer pump shall be provided and include a fuel primer momentary switch located on a panel under the dash to activate the primer pump. A check valve and by-pass system shall be installed for normal draw of fuel for the engine fuel pump.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1730 : FUEL TANK**

The fuel tank shall have a minimum capacity of one hundred (100) gallons and measure 35.00 inches wide X 15.00 inches high X 48.00 inches long. The baffled tank shall be made of 14 gauge aluminized steel. The tank exterior is painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The fuel tank shall be mounted 2.00 inch below the frame, behind the rear axle. The tank can be easily lowered and removed for service purposes.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

Dual draw tubes and dual sender ports shall be installed. A 2.00 inch NPT fill ports shall be available for right or left hand fill. A 0.5 inch NPT drain plug shall be centered in the bottom of the tank.

#### **C-1740 : FUEL TANK FILL PORT**

The fuel tank fill ports shall be provided with the right fill port located in the rearward position and the left fill ports located one (1) in the forward position and one (1) in the middle position of the fuel tank.

#### **C-1750 : FUEL TANK MAGNETIC DRAIN PLUG**

A 0.5 inch NPT magnetic drain plug shall be centered in the bottom of the tank.

#### **C-1760 : FUEL TANK SERVICEABILITY PROVISIONS**

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8 ft. of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

#### **C-1770 : FRONT AXLE**

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-23. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 23,000 pounds. This rating shall require special approvals from the wheel manufacturers.

#### **C-1780 : FRONT WHEEL BEARING LUBRICATION**

The front axle wheel bearings shall be lubricated with clear oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.



# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1790 : FRONT SHOCK ABSORBERS**

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or "road sensing" designed shocks shall not be considered.

#### **C-1800 : FRONT SUSPENSION**

The front suspension shall include nine (9) leaf, 53.38 inch long and 4.00 inches wide taper leaf springs with a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 23,000 pounds.

#### **C-1810 : STEERING COLUMN/ WHEEL**

The cab shall include a Douglas Autotech steering column shall be a seven (7) position tilt and 2.25 inch telescopic type with an 18.00 inch steering wheel located on the left side of the cab designating the driver's position. The steering wheel shall be covered with black absorbite padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

#### **C-1820 : POWER STEERING PUMP**

The hydraulic power steering pump shall be a Vickers 20V and shall be gear driven from the engine. The pump shall be a fixed displacement vane type.

#### **C-1830 : ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR**

The power steering fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

#### **C-1840 : FRONT AXLE CRAMP ANGLE**

The chassis shall have a front axle cramp angle of 48 degrees to the left and 44 degrees to the right.

#### **C-1850 : POWER STEERING GEAR**

The power steering gear shall be a TRW model TAS 85 with an assist cylinder.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1860 : CHASSIS ALIGNMENT**

The chassis frame rails shall be cross checked to insure the length and to make sure each is square. The front and rear axles shall be laser aligned, additionally the tires and wheels shall be aligned and toe-in set on the front tires. The completed apparatus shall be rechecked for proper alignment once the chassis has been fully loaded.

#### **C-1870 : REAR AXLE**

The rear axle shall be a Meritor model number RT-40-145 tandem drive axle. The axle shall offer the widest range of ratios available in an efficient single reduction axle design. The axle shall feature a robust housing design with a standard 0.5 inch wall thickness, a shot-peened hypoid Generoid gearing with bolted ring gear to differential case attachment backed by a thrust screw. The axle shall feature precision forged differential gears, one-piece forward carrier design, large diameter input shaft and a rigid differential case.

The axle shall feature precision forged differential gears and shall have a rated capacity of 40,000 pounds.

#### **C-1880 : REAR WHEEL BEARING LUBRICATION**

The rear axle wheel bearings shall be lubricated with oil.

#### **C-1890 : REAR AXLE DIFFERENTIAL LUBRICATION**

The rear axle differential shall be lubricated with oil.

#### **C-1900 : REAR AXLE DIFFERENTIAL CONTROL**

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The inter-axle differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the inter-axle differential control.

#### **C-1910 : VEHICLE TOP SPEED**

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

#### **C-1920 : REAR SUSPENSION**

The tandem rear axle shall feature a Neway AD-248 air suspension. Each axle shall be independently suspended for optimum performance. The suspension shall include optimized air springs mounted to the equalizing beams and integral transverse beams. Adjustable torque rods and adjustable track bars shall also be included. The rear tandem suspension shall include 54.00 inch axle centers.

Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load.

The rear suspension is run flat compatible at reduced speeds.

The rear suspension capacity shall be rated at 40,000 to 44,000 pounds.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1930 : FRONT TIRE**

The front tires shall be Goodyear 425/65R-22.5 20PR "L" tubeless radial G286A SS mixed service tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a speed capacity of 68 miles per hour when properly inflated to 120 pounds per square inch.

The front tire US Fire Service Intermittent Usage load capacity shall be 22,800 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch.

#### **C-1940 : REAR TIRE**

The rear tires shall be Goodyear 11R-22.5 16PR "H" tubeless radial G149 RSA regional tread.

The rear tire stamped load capacity shall be 24,020 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch.

The rear tire US Fire Service Intermittent Usage load capacity shall be 25,700 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch.

#### **C-1950 : TIRE PRESSURE EQUALIZATION SYSTEM**

The rear dual tires shall include the Crossfire dual tire equalization system provided on both sets of dual tires on the rear axle. The Crossfire pressure system shall equalize and monitor the valve which is mounted between the dual tires. This shall bolt easily to the drive axle end allowing air to flow freely from one tire to the other, maintaining equal tire pressure and load distribution. The Crossfire system shall maximize tire life, decrease rolling resistance for increased fuel mileage and improve stability braking and overall safety.

#### **C-1960 : TIRE PRESSURE INDICATOR**

There shall be a pop up style tire pressure indicator at the front tire valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

#### **C-1970 : FRONT WHEEL**

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch aluminum wheels with the Alcoa XBR Dura-Bright® wheel treatment as an integral part of the wheel. Alcoa XBR Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

#### **C-1980 : REAR WHEEL**

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with the Alcoa XBR Dura-Bright® wheel treatment as an integral part of the wheel. Alcoa XBR Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-1990 : BRAKE SYSTEM**

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a total of 6220 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A six (6) sensor, six (6) modulator anti-lock braking system (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Automatic traction control which shall be installed on the tandem rear axle. The automatic traction control system shall apply the anti-lock braking system when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

Additional handling capabilities shall include roll stability control which shall monitor the vehicles rollover threshold based on the lateral acceleration. The system shall activate a computerized device which shall slow the vehicle when the threshold is exceeded in either direction. Normal vehicle operation shall resume once the problematic conditions cease. Roll stability control shall be integral with the ABS and ATC systems.

A virtual style switch shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The electronic stability control unit (ESC) is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The CAN bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

#### **C-2000 : FRONT BRAKES**

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors.

#### **C-2010 : REAR BRAKES**

The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2020 : PARK BRAKE**

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

#### **C-2030 : PARK BRAKE CONTROL**

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted to the left side of the center panel of the dash within easy access of the driver. A guard shall be installed over the parking brake control to prevent accidental application or release.

#### **C-2040 : AIR DRYER**

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right frame rail behind the officer step.

#### **C-2050 : FRONT BRAKE CHAMBERS**

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

#### **C-2060 : REAR BRAKE CHAMBERS**

The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.

#### **C-2070 : AIR COMPRESSOR**

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

#### **C-2080 : AIR GOVERNOR**

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be mounted to the right frame rail.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **C-2090 : MOISTURE EJECTORS**

Manual drain valves shall be installed on all reservoirs of the air supply system. The drain valves shall have pull cables attached. The actuation pull cable shall be coiled and tied at the drain valve on the tank. The supplied lengths shall be sufficient to be extended to the frame rail to allow drains to be activated from the side of the chassis.

## **C-2100 : AIR SUPPLY LINES**

The air system lines shall include black textile braid covered high tensile steel reinforced wire braided hose with steel reusable fittings. All drop hoses shall be fiber reinforced neoprene covered hose.

## **C-2110 : WHEELBASE**

The chassis wheelbase shall be 267.00 inches.

## **C-2120 : REAR OVERHANG**

The chassis rear overhang shall be 128.00 inches.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### C-2130 : FRAME

The frame shall consist of double channel side rails and cross members forming a ladder style frame. The sides of the rails shall be constructed of "C" channel, 10.25 inches high X 3.5 inches deep X .38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and .38 inches thick, 110,000 psi minimum yield high strength low alloy steel. Each rail shall be considered on the following key items: Each rail shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches calculated by the radius method. The frame shall measure 35.00 inches in width.

RBM refers to the measure of stiffness of a cross section relative to the yield stress of the material the frame is manufactured from.

Every cross sectional profile of an object has a measure of its mechanical properties based on its shape. These properties of its shape can be broken down relative to the horizontal and vertical direction, represented as  $I_{xx}$  and  $I_{yy}$ . These act as a measure of the shape's resistance to bending.

The section modulus of mass of this profile takes into consideration the stresses imposed on this profile when a load is applied, by considering the maximum distance from the center of the profile to its outer most extremity. Section modulus is a method of measurement for the relative stiffness of a beam section and is based on the horizontal and vertical directional value plus the distance from the center of mass to the extremities of the cross section from the coordinate axis, such that  $Z_{yy} = I_{yy}/Y$  and  $Z_{xx} = I_{xx}/X$ .

Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the engine mounting, body mounting, pump mounting or bumpers shall not be considered as a cross member. The cross members shall be attached using grade 8 flanged head bolts and flanged lock nuts. Each cross member shall be mounted to the frame rails a minimum of utilizing 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All holes for bolts shall be drilled into the frame rails, preventing fracture or fatigue. Each hole shall be custom placed relative to its component preventing unnecessary holes that present fatigue along each frame rail.

The frames proposed shall be custom drilled for each component and shall not include any unnecessary holes.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall accompany the bid.

Proposals offering warranties for frames not including cross members shall not be considered.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **FRAME WARRANTY**

The frame and cross members shall carry a lifetime warranty to the original purchaser.

## **C-2140 : FRAME CLEAR AREA**

The chassis frame shall be left clear of chassis mounted components inside or outside the frame rails within the first 30.00 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.

## **C-2150 : FRAME PAINT**

The chassis under carriage consisting of frame, axles, driveline running gear, battery boxes, air tanks and other assorted chassis mounted components shall be painted with gloss black paint. Paint shall be applied prior to airline and electrical wiring installation.

## **C-2160 : FRONT BUMPER**

The cab shall include a five (5) piece, structural channel front bumper. The bumper shall be constructed of ASTM A-36 steel; the bumper shall then be painted. The bumper shall include a .38 thick structural steel channel which shall be 12.00 inches high and 101.00 inch wide, with angled front corners.

## **C-2170 : FRONT BUMPER EXTENSION LENGTH**

The front bumper shall be extended 6.00 inches ahead of the cab.

## **C-2180 : FRONT BUMPER EXTENSION WIDTH**

The front bumper extension splayed frame rails shall include an overall width of 44.75 inches.

## **C-2190 : FRONT BUMPER PAINT**

The front bumper shall include a finish topcoat painted the same as the lower cab color.

## **C-2200 : FRONT BUMPER APRON**

The 6.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

## **C-2210 : AIR HORN**

The front bumper shall include two (2) Grover brand air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horn shall be a trumpet style and shall include a chrome finish.



# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2220 : AIR HORN LOCATION**

The air horns shall be recess mounted in the front bumper face, one (1) on the driver side of the bumper in the inboard position relative to the left hand frame rail and one (1) on the officer side of the bumper in the inboard position relative to the right hand frame rail.

#### **C-2230 : AIR HORN RESERVOIR**

One (1) air tank, with a 2084 cubic inch reservoir, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

#### **C-2240 : ELECTRONIC SIREN SPEAKER**

The bumper shall include two (2) Whelen Engineering Inc. model SA314A natural cast aluminum speaker which shall be recess mounted within the bumper fascia. The speakers shall feature 100 watts of power and comply with OSHA 1910.95 regarding "Permissible Noise Exposure". Both speakers shall measure approximately 7.30 inches high X 8.80 inches long X 3.00 inches deep.

#### **C-2250 : ELECTRONIC SIREN SPEAKER LOCATION**

The speakers shall be located one (1) on the driver's side and one (1) on the officer's side of the bumper fascia, outboard of the frame rails.

#### **C-2260 : AUXILIARY ELECTRONIC SIREN SPEAKER**

The bumper shall include one (1) Federal Signal model BP200-Q auxiliary speaker which shall be recess mounted within the bumper fascia and include the classic "Q-look" grille. The speaker shall feature 200 watts of power. The speaker shall measure approximately 5.50 inches high X 7.70 inches wide X 7.80 inches deep.

#### **C-2270 : AUXILIARY SIREN SPEAKER LOCATION**

The auxiliary siren speaker shall be located in the bumper fascia centered between the frame rails.

#### **C-2280 : FRONT BUMPER TOW HOOKS**

Two (2) heavy duty tow hooks, painted black shall be installed below the front bumper, rearward position and bolted directly to the side of the chassis frame with grade 8.00 bolts.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2290 : CAB TILT SYSTEM**

The entire cab shall be capable of tilting 45 degrees to allow for easy maintenance of the engine and transmission.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90" ball and be anchored to frame brackets with 1.25" diameter studs.

A steel safety channel assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

#### **C-2300 : CAB TILT AUXILIARY PUMP**

A manual cab tilt pump module shall be attached to the rear surface of the driver side battery box.

#### **C-2310 : CAB TILT CONTROL RECEPTACLE**

The cab tilt shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a 6-pin Deutsch connector that includes a cap. The remote control pendant shall also include 20.00 feet of cable which also includes a mating connector.

#### **C-2320 : CAB WINDSHIELD**

The cab windshield shall have a surface area of 2884.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

The distance from the driver and officer to the windshield shall be a minimum of 42.00 inches at the furthest seated position. This distance shall ensure the safety of the driver and officer from intruding objects in the unlikely event of a head on collision.

The glass utilized for the windshield a standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and maintenance costs. All proposals offering windshields not in compliance with the minimum measurement of surface area stated above and are not fully interchangeable shall not be considered.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2330 : GLASS FRONT DOOR**

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished via electric actuation. The power windows shall be controlled via switching on the driver door and by a switch on each respective door.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

#### **C-2340 : GLASS TINT FRONT DOOR**

The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

#### **C-2350 : CLIMATE CONTROL**

The cab shall be equipped with a ceiling mounted combination defrost / heating and air-conditioning system mounted above the engine tunnel in a central location.

The system shall offer sixteen (16) adjustable louvers. Six (6) of the louvers shall face forward towards the windshield, offering 45,000 BTU of heat at 320 CFM for defrosting. The system shall include six (6) rearward facing louvers to direct air for the crew area and four (4) for driver and officer comfort. When in "Cabin Mode" the system shall be designed to produce 60,000 BTU of heat and 32,000 BTU of cooling. The HVAC cover shall be made of ABS plastic.

All auxiliary heating units (if optionally equipped) shall be plumbed in series independent of the heater/defroster system with one (1) seasonal shut-off valve at the front corner on the officer side of the cab.

The air conditioning system shall be capable of lowering the cab interior temperature from 100 degrees to 70 degrees within thirty minutes, with a relative humidity of sixty percent.

The air conditioner lines shall be a mixture of custom bent zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-Quip EZ-Clip fittings.

#### **C-2360 : CLIMATE CONTROL ACTIVATION**

The heating controls, and air conditioning if included, shall be located on the center dash panel, lower left hand corner.

#### **C-2370 : A/C CONDENSER LOCATION**

A roof mounted A/C condenser shall be installed centered on cab forward of raised roof against the slope rise.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2380 : A/C COMPRESSOR**

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

#### **C-2390 : CAB CIRCULATION FANS FRONT**

The cab shall include two (2) all metal construction 6.00 inch windshield defogger fans which shall be installed in the front cab corners. The fans shall be individually controlled via a virtual button on the Vista.

#### **C-2400 : CAB INSULATION**

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall include a foil facing which includes grid reinforcement. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

#### **C-2410 : UNDER CAB INSULATION**

The exterior of the cab tunnel surrounding the engine shall include reinforced closed cell foam insulation. The insulation shall measure 1.00 inch thick and shall include a foil backing and grid reinforcement. The foam shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation under the tunnel shall act as a noise barrier absorbing noise from the engine as well as assisting in sustaining the desired climate within the cab interior. A removable aluminum overlay shall be installed over the insulation for protection.

Additionally, the entire underside of the cab shall include reinforced closed cell foam insulation. The insulation shall measure 1.00 inch thick and shall include a foil backing and grid reinforcement. The foam shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation under the cab floor shall act as a noise barrier absorbing noise from the road as well as assisting in sustaining the desired climate within the cab interior. An expanded aluminum overlay shall be installed to hold the insulation tight against the underside of the cab.

#### **C-2420 : INTERIOR TRIM FLOOR MAT**

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch sound absorbing closed cell foam and a 0.06 inch non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive with aluminum corner trim. All exposed seams shall be sealed with a silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

#### **C-2420 : INTERIOR TRIM VINYL**

The cab interior shall include trim on the front and rear crew ceiling and the cab walls with the rear wall of the cab being aluminum sheet metal covered by red Line-X® spray on composite protective coating. The trim shall be constructed of insulated vinyl over a hard board backing. The material shall be securely fastened to the interior of the cab utilizing snap style fasteners with a decorative fastener for a more appealing appearance.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2430 : HEADER TRIM**

The cab interior shall include a header over the driver and officer dash which shall be vacuum formed ABS composite panel with robust styling grooves providing structural integrity. The header shall include (2) vents within the header which are directed at the windshield. Also included will be a drop down panel for access behind the header for service of electronic components, if necessary. The header shall include (2) cut outs, (1) over the driver and (1) over the officer to accommodate speakers and molded areas to accommodate the sun visors.

#### **C-2440 : INTERIOR TRIM SUN VISOR**

The header shall include two (2) 7.00 inches high X 18.00 inches wide impact resistant, transparent acrylic polycarbonate sun visors with a smoke gray tint shall be provided and installed on the header above the driver and officer.

The see thru visors are designed for maximum flexibility of positioning utilizing an arm with virtually unlimited adjustability with 13.50 inch long lateral travel of the tinted visor at the end of the arm which can be locked in place by a thumbscrew.

The visors are easily adjusted and can be placed into a chosen position with one hand. The sun visors will help protect vehicle occupants from solar glare without obscuring their vision.

#### **C-2450 : TRIM LH DASH**

The left hand dash shall be a one (1) piece durable vacuum formed ABS composite housing which shall be custom molded for a perfect fit around the instrument panel and the lower control panels to the left and right of the steering column.

#### **C-2460 : TRIM CENTER DASH**

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick, one hundred percent primary aluminum plate.

#### **C-2470 : TRIM RH DASH**

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick, one hundred percent primary aluminum plate and shall include a glove compartment with a hinged door.

#### **C-2480 : ENGINE TUNNEL TRIM**

The cab engine tunnel shall be covered with .44 of an inch thick multi-layer mat consisting of .25 inch closed cell foam, .13 of an inch thick rubber and .06 inch thick non-slip pebble grain.

#### **C-2490 : POWER POINT DASH MOUNT**

The cab shall include two (2) 12 volt cigarette lighter type receptacles in the cab dash dedicated as a power source for additional portable or mobile items. One (1) receptacle shall be wired battery direct and one (1) receptacle shall be wired live with the battery master switch.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2500 : STEP TRIM**

The cab steps shall include a 14 gauge 304 perforated stainless steel construction on the first step, the step closest to the ground. The stainless steel finish shall be a number 7 mirror. The step shall include a frame which is integral with the construction of the cab for rigidity and strength. The perforation shall allow water and other debris to flow through rather than becoming packed under the step. The middle step shall be integral with the cab in construction and shall be trimmed in 3003-H22 embossed aluminum tread plate which is 0.084 inches thick.

#### **C-2510 : INTERIOR DOOR TRIM**

The doors of the cab shall include an aluminum plate the same weight and grade as the cab on the interior of the door. The aluminum shall be then painted.

#### **C-2520 : DOOR TRIM CUSTOMER NAMEPLATE**

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

#### **C-2530 : CAB DOOR TRIM REFLECTIVE**

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior of each cab door.

#### **C-2540 : INTERIOR GRAB HANDLE "A" PILLAR**

A rubber covered 11.00 inch grab handle shall be provided on the inside of the cab on the hinge post at the driver and officer doors. The handle shall assist personnel in exiting and entering the cab.

#### **C-2550 : INTERIOR GRAB HANDLE FRONT DOOR**

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish and provide ease of access and exiting the cab.

#### **C-2560 : INTERIOR FLOOR MAT COLOR**

The cab interior floor mat shall be black in color.

#### **C-2570 : INTERIOR TRIM VINYL COLOR**

The cab interior vinyl trim surfaces shall be black in color.

#### **C-2580 : INTERIOR ABS TRIM COLOR**

The cab interior vacuum formed ABS composite trim surfaces shall be black in color.

#### **C-2590 : CAB PAINT INTERIOR**

The interior metal surfaces of the cab shall be finished with Line-X<sup>®</sup> spray on bed liner product which shall mold to each surface of the cab interior. The Line-X<sup>®</sup> shall be environmentally friendly and chemically resistant. The color of the interior shall be red.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2600 : CAB PAINT INTERIOR DOOR TRIM**

The inner door panel surfaces shall be painted with a high durability pebble grain Linex<sup>®</sup> spray on liner. The color of the spray on liner shall be dark red.

#### **C-2610 : DASH PANEL GROUP**

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

#### **C-2620 : SWITCHES CENTER PANEL**

The center dash panel shall include two (2) rocker switch positions in a single row configuration in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have red backlighting provided.

#### **C-2630 : SWITCHES LEFT PANEL**

The left dash panel shall include one (1) wiper switch which shall be located in the left hand side of the panel. All switch legends shall have red backlighting provided.

#### **C-2640 : SWITCHES RIGHT PANEL**

The right dash panel shall include no rocker switches or legends.

#### **C-2650 : SWITCH PANEL IGNITION**

The vehicle shall be equipped with a keyless ignition and master, with an "Off/ On" and a two switch for "Off/ Start".

#### **C-2660 : SEAT BELT WARNING**

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the chassis. The system shall provide visual and audible warning when any seat is occupied (sixty pounds minimum), the corresponding seat belt remains unfastened, and the park brake is released.

Once activated, the visual and audible indicators shall remain active until all occupied seats have the seat belts fastened. The dash shall include a display on the Weldon Vista screen(s) indicating the occupancy of each seat.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2670 : SEAT MATERIAL**

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

#### **C-2680 : SEAT COLOR**

All seats supplied on the chassis shall be black in color. This material shall be semi- resistant to UV rays and from being saturated or contaminated by fluids.

#### **C-2690 : SEAT BACK LOGO**

The seat back shall include a Houston, TX Fire Department logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

#### **C-2700 : SEAT DRIVER**

The driver's seat shall be an H.O. Bostrom Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

#### **C-2710 : SEAT BACK DRIVER**

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.



# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2720 : SEAT OFFICER**

The officer's seat shall be an H.O. Bostrom Firefighter model seat. The seat shall feature two-way manual adjustment and shall include a tapered and padded seat cushion. The seat shall also feature integral springs to isolate shock.

There shall be a red, three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, "Seat belt assembly anchorages".

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207, 209, 210 and 302 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

#### **C-2730 : SEAT BACK OFFICER**

The officer's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

#### **C-2740 : POWER SEAT WIRING**

The power seat or seats installed in the cab shall be wired directly to battery power.

#### **C-2750 : CAB FRONT UNDERSEAT STORAGE ACCESS**

The left and right front under seat storage areas shall each have a solid aluminum hinged door with a non-locking latch. The surface of the doors facing the interior of the cab shall be coated with the same material as the interior metal surfaces of the cab.

#### **C-2760 : WINDSHIELD WIPER SYSTEM**

The cab shall include a parallel arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers, one (1) for the driver and one (1) for the officer, which shall be affixed to a rod style arm. The system shall include a single motor which shall initiate the arm in which both the driver and officer windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

#### **C-2770 : ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR**

The windshield washer fluid level shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2780 : CAB DOOR HARDWARE**

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be aluminum with a polished chrome plated finish. The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel. All doors shall be keyed alike and designed to prevent accidental lockout.

The interior latches shall be black flush paddle type, which are incorporated into an upper door panel.

#### **C-2790 : DOOR LOCKS**

The doors shall include a CAN based electronic door lock system which shall include two (2) keypads, one (1) located on the driver's side next to the front grab handle and one (1) on the officer's side next to the front grab handle. The electronic door locks shall feature four (4) key fobs for activation with buttons for entry door lock and unlock, compartment door lock and unlock shall be provided. There shall be two (2) rocker switches provided, one (1) located on the inside of the driver's side front door and one (1) located on the officer's side front door. The power door locks shall control the front two (2) entry doors of the cab.

#### **C-2800 : POWER DOOR LOCK COMPARTMENT PROVISION**

The power door lock feature shall include up to eight (8) compartment doors featuring controls through the key fob and through a virtual switch on the multiplex display.

#### **C-2810 : DOOR LOCK LH REAR CAB COMPARTMENT**

The driver side rear compartment shall feature a power door lock actuator.

#### **C-2820 : DOOR LOCK RH REAR CAB COMPARTMENT**

The officer side rear compartment shall feature a power door lock actuator.

#### **C-2830 : GRAB HANDLES**

The cab shall include one (1) each 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The assist handle shall be made of 14 gauge 304- stainless steel and be 1.25 inch diameter to enable easy grabbing with the gloved hand. Each assist handle shall include a stainless steel plate behind which saves the cab from scuffs through continued use of the handle.

#### **C-2840 : AUXILIARY GRAB HANDLE**

There shall be an 18.00 inch grab handle constructed of molded steel attached to the front fascia of the cab. The handle shall include steel reinforcement behind the skin of cab fascia. There shall also be a stainless steel plate behind the handle which shall protect the cab paint.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-2850 : REARVIEW MIRRORS**

Ramco model 6015-FFHR-750R bus style mirrors shall be provided. The mirror heads shall be polished cast aluminum and shall measure 9.75 inches wide X 13.00 inches high with an additional top mount convex assembly. The mirrors shall be mounted one (1) on each front cab corner radius below the windshield with 15.00 inch long polished cast aluminum arms.

The mirrors shall feature a remote controlled heated full flat glass and a top mounted remote controlled convex glass. The mirror control switches shall be located within easy reach of the driver and a mirror heat switch shall be provided on the dash. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounting thereby reducing vibration. The mirrors shall be corrosion free under all weather conditions.

#### **C-2860 : REARVIEW MIRROR HEAT SWITCH**

The heated rearview mirrors shall be controlled through a virtual button on the multiplex display.

#### **C-2870 : TRIM LOWER SIDE**

A stainless steel trim band, 10.00 inches high, with upper and lower black and chrome trim moldings, shall be installed on the lower exterior sides of the cab and doors. The trim shall be installed so that the top edge is even with the top of the front bumper, and shall be affixed without holes and fasteners.

#### **C-2880 : CAB FENDER**

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. The two-piece liners shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel.

#### **C-2890 : MUD FLAPS FRONT**

The front wheel wells shall have mud flaps installed on them.

#### **C-2900 : CAB EXTERIOR MODEL NAMEPLATE**

The cab shall include custom "Gladiator" nameplates on the front driver and officer side doors.

#### **C-2910 : CAB EXTERIOR FRONT & SIDE EMBLEMS**

The chassis shall include three (3) chassis manufacturer's emblems. There shall be one (1) installed on the front air intake grille and one (1) installed on each side of the cab above the wheel well.

#### **C-2920 : IGNITION**

The master starting system, ignition system shall include chrome thumb turn switch which shall be mounted on the driver side of the cab to the left of the steering wheel on the dash. Each switch will be accompanied by (1) green LED indication light which shall light when the ignition is in the "ON" position and (1) for the master battery switch when in the "ON" position. The thumb turn switches shall also be accompanied by a chrome push button which shall only operate when both the master battery and ignition thumb switches are in the "ON" position.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2930 : BATTERY**

The single start electrical system shall include six (6) Odyssey 1090 CCA batteries with a 200 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

#### **C-2940 : BATTERY BOX**

The batteries shall be contained within two (2) black powder coated steel battery boxes which shall be located on the driver side of the chassis, securely bolted to the frame rails. The boxes shall include drain holes in the bottom for sufficient drainage of water and shall include phenolic board battery hold downs and a durable, Dry-Deck in the bottom of the tray under each battery to allow for air flow and drainage.

#### **C-2950 : BATTERY CABLE**

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant. The cables shall have an additional six (6) feet coiled to accommodate OEM repositioning of batteries inside body.

#### **C-2960 : BATTERY JUMPER STUD**

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

#### **C-2970 : ALTERNATOR**

The starting system shall include a 320 amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

#### **C-2980 : AUXILIARY AIR COMPRESSOR**

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed behind the officer's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-2990 : ELECTRICAL INLET**

A Kussmaul 20 amp super auto-eject electrical receptacle shall be installed on the driver's side of the cab above the wheel well. It shall automatically eject the plug when the starter button is depressed.

*The U.L. maximum allowable amperage draw on receptacles is generally 80% of their listed rating, for example, the 20 amp receptacle should not carry more than 16 amp continuous load. When adding the different amperage draws of the components being installed on the chassis be sure to factor in whether the components will draw a continuous load or intermittent load.*

#### **Amp Draw Reference List:**

Kussmaul 1000 Charger - 3.5 Amps

Kussmaul 1200 Charger - 10 Amps

Kussmaul 35/10 Charger - 10 Amps

1000W Engine Heater - 8.33 Amps

1500W Engine Heater - 12.5 Amps

120V Air Compressor - 4.2 Amps

#### **C-3000 : ELECTRICAL INLET COLOR**

The Kussmaul Auto- Eject electrical inlet connection shall include a yellow cover.

#### **C-3010 : AUXILIARY ELECTRICAL INLET**

An auxiliary Kussmaul 30 amp super auto-eject electrical receptacle shall be prewire left hand cab side mid.

#### **C-3020 : AUXILIARY ELECTRICAL INLET COLOR**

The additional Kussmaul Auto- Eject electrical inlet connection shall include a red cover.

#### **C-3030 : HEADLIGHTS**

The cab front shall include (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels. The headlamps and marker lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position and the parking brake is released.

The headlights shall be controlled via a virtual button on the Vista display.

#### **C-3040 : FRONT TURN SIGNALS**

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable LED amber turn signals which shall be installed in the upper position over the warning lights.

#### **C-3050 : HEADLIGHT LOCATION**

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

#### **C-3060 : SIDE MARKER/TURN SIGNALS**

The sides of the cab shall include (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-3070 : MARKER AND ICC LIGHTS**

In accordance with FMVSS, there shall be five (5) cab LED marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

#### **C-3080 : GROUND LIGHTS**

Each door shall include LED NFPA compliant light heads mounted to the under side of the cab. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated through the Vista screen and by the opening of either door on the respective side of the cab.

#### **C-3090 : STEP LIGHTS**

The middle step located at each door shall include a recess mounted LED light which shall activate with the opening of the respective door.

#### **C-3100 : ENGINE COMPARTMENT LIGHTS**

There shall be an incandescent NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

#### **C-3110 : SIDE SCENE LIGHT MODEL**

The side of the cab shall include two (2) Whelen 900 series 90C0ENZR model scene lights, one (1) each side which shall be recess mounted with a chrome bezel. The Whelen lights shall offer LED lighting at a gradient 32 degree angle.

#### **C-3120 : SIDE SCENE LIGHT LOCATION**

The scene lights located on the left and right sides of the cab shall be mounted in the upper front raised roof portion of the cab above the front doors.

#### **C-3130 : SIDE SCENE ACTIVATION**

The scene lighting shall be activated via two (2) virtual buttons on the MUX display located inside the cab.

#### **C-3140 : INTERIOR OVERHEAD LIGHTING**

The cab shall include an incandescent dome lamp with a red and white lens located over each door. The dome lamps shall be rectangular in shape and shall measure 9.50 inches in length and approximately 5.00 inches wide including a black colored bezel. The white lamp shall be activated by its respective door when opened and via the multiplex display and both the red and white lamp shall be activated by an individual switch on the light.

An additional red and clear lamp shall be located in the headliner, over the engine tunnel

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-3150 : MAP LIGHTS**

Two (2) Sunnex brand gooseneck style instrument panel map lights with switches at the base shall be mounted overhead to the air conditioning cover. One (1) each on the driver's side and one (1) each on the officer's side.

#### **C-3160 : DO NOT MOVE APPARATUS LIGHT**

The front headliner of the cab shall include a Whelen 500 series Red LED light with clear lens, located in the center for greatest visibility. The light shall be 5.40 inches long X 1.70 inches wide X 0.90 inches high and shall be clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound when a door is open and the parking brake is released.

The light and alarm shall be interlocked for activation when a cab door is not firmly closed, an apparatus cabinet door is not closed and the parking brake is released

#### **C-3170 : MASTER WARNING SWITCH**

The optical warning system shall be controlled by a master switch which shall include all "ON" and all "OFF" capability via a virtual button within the MUX display. All warning lights which are "ON" when the master switch is activated shall also activate. This switch shall be clearly labeled for identification.

#### **C-3180 : HEADLIGHT FLASHER**

An alternating high beam headlamp flashing system shall be installed into the high beam headlamp circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

#### **C-3190 : ALTERNATING HEADLIGHT SWITCH**

The flashing headlights shall be activated through a virtual button on the MUX display.

#### **C-3200 : INBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include dual Whelen series 600 Super LED warning lights which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the inboard position.

#### **C-3210 : INBOARD FRONT WARNING LIGHTS COLOR**

The front warning lights mounted on the fascia for the inboard position shall be blue with a clear lens.

#### **C-3220 : OUTBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include dual Whelen series 600 Super LED warning lights which shall offer 14 flash patterns plus a steady burn for solid colors and 20 flash patterns plus a steady burn for split colors. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the outboard position.

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## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-3230 : OUTBOARD FRONT WARNING LIGHTS COLOR**

The front warning lights mounted on the fascia for the outboard position shall be red with a clear lens.

#### **C-3240 : FRONT WARNING SWITCH**

The front warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

#### **C-3250 : INTERSECTION WARNING LIGHTS**

The chassis shall include two (2) Whelen series 600 Super LED intersection warning lights, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

#### **C-3260 : INTERSECTION WARNING LIGHTS COLOR**

The intersection lights shall be red with a clear lens.

#### **C-3270 : INTERSECTION WARNING LIGHTS LOCATION**

The intersection lights shall be mounted on the side of the cab on the front radius.

#### **C-3280 : SIDE WARNING LIGHTS**

The cab sides shall include a Whelen series 600 Super LED 4"x6" warning light, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

#### **C-3290 : SIDE WARNING LIGHTS COLOR**

The warning lights located on the side of the chassis shall be red with clear lens.

#### **C-3300 : SIDE WARNING LIGHTS LOCATION**

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

#### **C-3310 : SIDE AND INTERSECTION WARNING SWITCH**

The side warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

#### **C-3320 : INTERIOR DOOR WARNING LIGHTS**

The interior panels of each door shall include one (1) red Whelen 500 series Super LED warning light which shall be provided on the inner surface of each cab door. The lights shall have clear lenses over red LEDs. Each light shall activate with a flashing pattern when the door is in the open position to serve as an indicator to oncoming traffic.



# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **C-3330 : SIREN CONTROL HEAD**

A Whelen 295HFS2 200 watt "hands free" remote siren amplifier control head shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature hands free mode and will be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

#### **C-3340 : HORN RING SELECTOR SWITCH**

A virtual button on the MUX display shall allow control to either the air horn or the electric horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position which is in accordance with FMVSS requirements.

#### **C-3350 : AIR HORN ACTIVATION**

The air horn actuation shall be accomplished by the steering wheel horn button. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

#### **C-3360 : BACK-UP ALARM**

An Preco-Matic model 1059 dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of not less than 87 dB and up to 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

#### **C-3370 : AUXILIARY ELECTRONIC SIREN CONTROL HEAD**

An additional Federal EQ2B 200 watt electronic siren head shall be provided and installed in the switch panel with a location specific to the customer's needs. The siren shall feature "Q" wail, yelp, air horn, PA, radio broadcast and "Q" brake. The siren shall produce 122 decibels at 10 feet away and shall include a noise cancelling microphone.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### C-3380 : INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. The gauges shall be backlit with red LED lamps. All gauges shall be driven by stepper motor movements. The instrumentation system shall be multiplexed and shall receive engine and transmission information over the J1939 data bus to reduce redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) electronic speedometer with an integral LCD odometer/ trip odometer and hour meter shall be included. The speedometer shall have a dual scale with miles per hour (MPH) as the dominant scale and kilometers per hour (KPH) on the minor scale. The speedometer scale shall read from 0 to 90 MPH (0 to 140 KPH). The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display up to 9,999.9 miles. The LCD screen shall also be capable of displaying certain diagnostic functions. The hour meter shall display engine hours of operation.

One (1) three function gauge with primary system, secondary system and fuel level shall be included. The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI). The air pressure scales shall be non-linear to expand the scales in the region of normal operation. A red indicator light in the gauge shall indicate a low air pressure. The scale on the fuel level gauge shall read from empty to full. A yellow indicator light shall indicate low fuel at the quarter tank level.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter shall be included. The scale on the engine oil pressure gauge shall read from 0 to 140 pounds per square inch (PSI). The engine oil pressure scale shall be non-linear to expand the scale in the region of normal operation. A red indicator light in the gauge shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 160 to 250 degrees Fahrenheit (F). A red indicator light in the gauge shall indicate high coolant temperature. The scale on the transmission oil temperature gauge shall read from 100 to 300 degrees Fahrenheit (F). A red indicator light in the gauge shall indicate high transmission oil temperature. The scale on the voltmeter shall read from 8 to 16 volts. A red indicator light shall indicate high or low system voltage.

The instrument panel shall contain an Enunciator Module that contains the following indicator lights. All indicator lights shall contain LED lamps.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **RED LAMPS**

Stop Engine - indicates critical engine fault. (5)  
Park Brake - indicates park brake is set.  
Volts - indicates high or low system voltage. (4)  
Low Oil Press - indicates low engine oil pressure. (4)  
High Coolant Temp - indicates excessive engine coolant temperature. (4)  
High Trans Temp - indicates excessive transmission oil temperature. (4)  
Low Air - indicates low air pressure in either system one or system two. (4)  
Low Coolant Level - indicates low engine coolant level. (1) (5)  
Air Filter - indicates excessive engine air intake restriction. (5)  
Brake System Fault – indicates a failure in the brake system (hydraulic brake systems only). (5)  
Seat Belt Indicator – indicates when a seat is occupied and corresponding seat belt remains unfastened.

#### **YELLOW LAMPS**

Check Engine - indicates engine fault. (5)  
Check Trans - indicates transmission fault. (5)  
Wait to Start - indicates active engine air preheat cycle. (2) (5)  
ABS - indicates anti-lock brake system fault. (5)  
Water in Fuel - indicates presence of water in fuel filter. (1) (5)  
Check Message Center – indicates there is a fault message present in the LCD digital display.  
SRS – indicates a problem in the RollTek supplemental restraint system. (1) (5)  
DPF – indicates a restriction of the diesel particulate filter. (3) (5)  
HEST – indicates a high exhaust system temperature. (3) (5)  
MIL – indicates an engine emission control system fault. (3) (5)  
Low Fuel – indicates low fuel. (4)

#### **GREEN LAMPS**

Left and Right turn signal indicators.  
Aux Brake Active - indicates secondary braking device is active. (1)  
High Idle - indicates engine high idle is active. (1)  
ATC – indicates low wheel traction for automatic tractions control equipped vehicles, also indicates mud/snow mode is active for ATC system. (1) (5)  
OK to Pump – indicates the pump engage conditions have been met. (1)  
Pump Engaged – indicates the pump is currently in use. (1)

#### **BLUE LAMPS**

High beam indicator.

The instrumentation system shall provide a constant audible alarm for the following situations:

Low air pressure.  
Low engine oil pressure.  
High engine coolant temperature.  
High transmission oil temperature.  
Low coolant level. (1)  
High or low system voltage  
Critical engine fault (Stop Engine).

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

The Check Message Center icon will illuminate and a message will be displayed in the LCD screen for the following situations:

- Cab Ajar
- Low Oil Level
- Door Ajar
- Engine Communication Error
- Transmission Communication Error
- ABS Communication Error
- High Coolant Temp
- Turn Signal Reminder (turn signal left on for more than one (1) mile)
- Low Fuel
- Low Oil Pressure
- Low Coolant Level
- Low Battery Voltage
- High Battery Voltage
- Low Primary Air Pressure
- Low Secondary Air Pressure
- High Trans Temp

The instrumentation system will provide a continuous alarm for the following situations:

- Stop Engine
- Low Coolant Level (1)
- Brake System Fault
- Check Trans
- Check Engine
- ABS
- Engine Communications Error
- Transmission Communications Error
- ABS Communications Error
- Low Fuel
- Low Primary Air Pressure
- Low Secondary Air Pressure
- Low or High Battery Voltage
- High Trans Temp
- Low Oil Pressure
- High Coolant Temp

The instrumentation system will provide a 160 millisecond second alarm every 880 milliseconds for the following situations:

- Seat Belt
- Air Filter
- Water in Fuel (1)
- Cab Ajar
- Low Oil Level
- Door Ajar

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

The instrumentation system will provide a 160 millisecond second alarm every 5 seconds for the following situation:

Turn Signal Reminder (turn signal left on for more than one (1) mile)

- (1) Feature only available when optionally equipped.*
- (2) Feature only available on engines with pre-heat capability.*
- (3) Feature only on vehicles with diesel particulate filter (DPF).*
- (4) Warning light is present in gauge.*
- (5) A message in the LCD screen will also be displayed.*

#### **C-3390 : RADIO**

A Panasonic compact disc player with AM/FM stereo receiver, weather band and four (4) speakers shall be installed in the cab. The receiver shall be installed above the driver position. The speakers shall also be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers in the upper rear corners of the cab.

#### **C-3400 : RADIO ANTENNA**

A small antenna shall be located on the driver side of the cab roof for AM/FM and weather band reception.

#### **C-3410 : CAMERA**

An Audiovox Voyager heavy duty rearview camera system shall be supplied. The system shall include one (1) box shaped camera shall be shipped loose for OEM installation in the body to afford the driver a clear view of the rear of the vehicle and one (1) teardrop shaped camera with a chrome plated plastic housing shall be mounted on the officer side of the cab below windshield ahead of the front door at approximately the same level as the cab door handle. The rear view camera shall be wired to a flip down monitor above the driver and the right side camera shall be wired to a single Weldon Vista display which shall be located on the driver side of the dash.

#### **C-3420 : CAB EXTERIOR PROTECTION**

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

#### **C-3430 : FIRE EXTINGUISHER**

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

#### **C-3440 : ROAD SAFETY KIT**

The cab and chassis shall include one (1) emergency road side triangle kit.

#### **C-3450 : DOOR KEYS**

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-3460 : DIAGNOSTIC SOFTWARE WELDON V-MUX**

The cab and chassis shall include diagnostic software for the Weldon VMUX system shipped loose with the vehicle.

The software kit shall include the following.

- One (1) carrying case
- One (1) USB Transceiver
- One (1) on one (1) cable for mini node
- One (1) on one (1) cable for Hercules node
- One (1) Deutsch wire removal tool, 14.00 to 16.00 gauge wire (blue)
- One (1) Deutsch wire removal tool, 18.00 to 20.00 gauge wire (red)
- One (1) cable, RS232 9 pin serial PC to transceiver
- One (1) cable, RS485 transceiver to VMUX
- One (1) cable which shall troubleshoot Hercules outputs
- One (1) cable which shall trouble shoot mini node outputs
- One (1) downloader manual
- One (1) diagnostics manual

The system shall support PDF and USB diagnostic kits for Windows 2000, Vista and XP.

#### **C-3470 : AS BUILT WIRING DIAGRAMS**

The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams.

#### **C-3480 : WARRANTY - CAB AND CHASSIS**

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of sixty (60) months, or the first 75,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the end user. The warranty may include conditional items listed in the detailed warranty document which shall be provided upon request.

#### **C-3490 : OPERATORS AND PARTS LIST MANUAL**

There shall be three (3) chassis operator's manual which includes a parts list including wiring and air plumbing diagrams provided and shipped loose with the vehicle. All standard wiring and plumbing diagrams shall be created specifically to the chassis model.

#### **C-3500 : ENGINE AND TRANSMISSION OPERATION MANUALS**

There shall be two (2) sets of engine operation and maintenance manuals and two (2) sets of transmission operation manuals specific to the models ordered will/shall included with the final vehicle in the ship loose items.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **C-3510 : ENGINE SERVICE MANUALS**

There shall be one (1) set of the following Cummins ISM engine service reference manuals which shall be provided with the final vehicle.

Engine Troubleshooting and Repair Manual, part number 3666322  
Fuel System Troubleshooting and Repair Manual, part number 4021461  
Shop Manual M11 Series Engine, part number 3666075  
Wiring Diagram, part number 3666269  
Parts Catalog, part number 4056523  
Operation and Maintenance Manual, part number 4021342

#### **C-3520 : TRANSMISSION SERVICE MANUALS**

There shall be one (1) set of the following manuals included with the chassis relative to the Allison 4000 transmission:

Allison Parts Catalog, part number PC2809EN  
Allison Service Manual, part number SM2457EN  
Allison Technician Manual, part number GN2055EN  
Electronic Controls Troubleshooting Manual, part number TS2973EN  
Mechanic's Tips, part number MT3004EN

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section D

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### **D-1000 : CHASSIS MODIFICATIONS**

#### **D-1010 : LUBRICATION AND TIRE DATA PLATE**

A permanent label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid . . (if applicable)
- Pump priming system fluid, if applicable . . (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant . . (if applicable)
- Air conditioning lubrication oil . . (if applicable)
- Power steering fluid
- Cab tilt mechanism fluid . . (if applicable)
- Transfer case fluid . . (if applicable)
- Equipment rack fluid (if applicable)
- CAFS air compressor system lubricant . . (if applicable)
- Generator system lubricant . . (if applicable)
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

#### **D-1020 : VEHICLE DATA PLATE**

A permanent label in the driving compartment which indicates the following:

- Filter part numbers for the
  - Engine
  - Transmission
  - Air
  - Fuel
- Serial numbers for the
  - Engine
  - Transmission
- Delivered Weights of the Front and Rear Axles
- Paint Brand and Code(s)
- Sales Order Number



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **D-1030 : OVERALL HEIGHT, LENGTH DATA PLATE**

The fire apparatus manufacturer shall permanently affix a high-visibility label in a location visible to the driver while seated.

The label shall show the height of the completed fire apparatus in feet and inches or in meters, the length of the completed fire apparatus in feet and inches or in meters, and the GVWR in tons or metric tons.

Wording on the label shall indicate that the information shown was current when the apparatus was manufactured and that, if the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate.

#### **D-1040 : ACCIDENT PREVENTION**

There shall be a placard in the cab seating area which reads, "ALL OCCUPANTS MUST BE SEATED AND BELTED WHEN THE APPARATUS IS IN MOTION".

#### **D-1050 : PERSONNEL CAPACITY**

A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

#### **D-1060 : ACCIDENT PREVENTION**

If the rear bumper is 8" deep or more, there shall be a placard on the rear face of the body, in clear sight from the ground, which reads, "WARNING - DO NOT RIDE ON STEPS OR DECK AREAS WHILE THE APPARATUS IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT".

#### **D-1070 : WEARING HELMET WARNING**

A label stating "DO NOT WEAR HELMET WHILE SEATED" shall be visible from each seating location.

#### **D-1080 : BUMPER GRAVELSHIELD**

The bumper extension gravel shield shall be provided by the cab/chassis manufacturer.

#### **D-1090 : AIR HORN(S)**

The air horn(s) shall be supplied and installed by the cab/chassis manufacturer.

#### **D-1100 : EXHAUST**

The existing exhaust tailpipe shall be extended to ahead of the rear axle on the streetside.

The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating.

Exhaust pipe discharge shall be directed away from any operator's position.

Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **D-1110 : RADIO SPEAKER INSTALLATION / RADIO PRE WIRE**

There shall be two (2) HOUSTON FIRE DEPARTMENT supplied radio speaker(s) installed in the cab/chassis. Each radio shall be installed per manufacturers requirements and wired for proper 12 volt power and ground, and be located on B post, one (1) each side, HFD to provide – SVI will run wiring to the radio in center dash

## **D-1120 : SEAT BELT COLOR**

Section 14.1.3.4 of the NFPA 1901 Standards, 2009 edition, requires all seat belt webbing in cab to be bright red or bright orange in color, and the buckle portion of the seat belt shall be mounted on a rigid or semi rigid stalk such that the buckle remains positioned in an accessible location.

## **D-1130 : SEAT BELT WEB LENGTH - CUSTOM CAB**

Sections 14.1.3.2 and 14.1.3.3 of the NFPA 1901 standards, 2009 edition, require the effective seat belt web length for a Type 1 lap belt for pelvic restraint to be a minimum of 60", and a Type 2 pelvic and upper torso restraint-style seat belt assembly to be a minimum of 110".

The chassis seat belt web length as supplied by the custom chassis manufacturer shall be compliant to NFPA Standards 14.1.3.2 and 14.1.3.3.

## **D-1140 : SEAT BELT / VDR SYSTEM - CUSTOM CAB**

The seat belt warning and vehicle data recorder systems be provided by the cab/chassis manufacturer.

## **D-1150 : HELMET STORAGE**

No helmet storage is required in the in the cab driving or crew area.

## **D-1160 : CAB CRASH TEST CERTIFICATION**

A cab crash test certification from the fire apparatus manufacturer shall be provided with the equipment. A copy of this certification shall be included with the bid.

NOTE: There shall be no exception to any portion of the cab integrity certification requirements. Nonconformance shall lead to immediate rejection of bid.

The certification shall state that the cab does meet or exceed the requirements below:

- 1) European Occupant Protection Standard ECE Regulation No. 29.
- 2) SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

## **D-1170 : CAB MIRRORS, DRIVER ADJUSTABLE**

Section 14.3.5 of the NFPA 1901 Standards, 2009 edition, requires all primary rear view mirrors used by the driver to be adjustable from the driver's position.

## **D-1180 : HUB AND NUT COVERS**

Front and rear wheels shall be provided with stainless steel hub caps and wheel nut covers.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **D-1190 : MUDFLAPS**

There shall be rubber mudflaps furnished and installed behind each set of tires.

#### **D-1200 : CAB COMPARTMENT ADJUSTABLE SHELF TRAC**

There shall be vertically mounted shelf trac for shelving installation provided in the chassis cab compartments.

#### **D-1210 : CAB COMPARTMENT ADJUSTABLE SHELVES**

There will be two (2) adjustable shelves approximately 46" deep provided, one (1) per side in the chassis cab compartments

#### **D-1220 : CAB COMPARTMENT SLIDE-OUT TRAYS**

There will be two (2) 1,000 lbs. slide-out trays with a OnScene Solutions bases mounted on the floor of the cab's compartments, one (1) per side. The trays will be approximately 46" deep and as wide as the compartment layout or door opening permits.

Each tray will have red/yellow conspicuity striping around the entire exterior tray perimeter.

#### **D-1230 : AUTOMATIC VEHICLE LEVELING SYSTEM**

A HWH brand leveling system shall be installed on the unit designed for large heavy duty vehicles with a GVWR over 23,000 pounds. The system shall have four (4) mounting brackets bolted to the chassis frame rails, two (2) front and two (2) rear. Each jack shall bolt to the bracket attached to the chassis frame.

The system shall have a drive-off safety feature. If the vehicle ignition switch is on and any legs are not fully retracted, a warning alarm shall sound.

The system shall be provided with a one (1) year limited warranty.

**NOTE:** Controller for the leveling system will be located in the cab within close proximity to the driver. The leveling system will be tied into the transmission interlock

#### **D-1240 : MDT / FLASHLIGHT INSTALLATION ON CUSTOM ENGINE TUNNEL CONSOLE**

There shall be a custom molded plastic engine tunnel console provided and installed by Metro Fire Apparatus per the HOUSTON FIRE DEPARTMENT's instructions.

One (1) MDT will be supplied by the HOUSTON FIRE DEPARTMENT. Metro Fire Apparatus will be responsible for installation per as per the HOUSTON FIRE DEPARTMENT's instructions.

Two (2) Body Manufacturer supplied Streamlight Fire Vulcan LED Flashlights will be provided. The mounting of the flashlights will be the responsibility of Metro Fire Apparatus and will be located per HOUSTON FIRE DEPARTMENT's instructions.

#### **D-1250 : FUEL FILL**

There shall be one (1) Cast Products fuel fill located on the rear of the body, streetside. The fill shall have a permanent label with the text "DIESEL FUEL ONLY". **NOTE: The fuel fill casting will not have a door.**

# HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION

## Section E

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### **E-1000 : BODY DESIGN**

The importance of public safety associated with emergency vehicles requires that the construction of this vehicle meet the following specifications. These specifications are written to establish the minimum level of quality and design.

It is the intent of these specifications to fully describe the requirements for a custom built emergency type vehicle. In order to extend the expected service life of this vehicle, the body module shall be removable from the chassis frame and be capable of being installed on a new chassis.

The sheet metal material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the HOUSTON FIRE DEPARTMENT to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the HOUSTON FIRE DEPARTMENT from such repair and shall NOT be used.

Following construction of the subframe, which supports the apparatus body, the sheet metal portion of the body shall be built directly on the subframe. The joining of the subframe and body shall be of a welded integral construction.

The sheet metal fabrication of the body shall be performed using inert gas continuous feed welders only. The entire body shall be welded construction. The use of pop rivets in any portion of structural construction may allow premature failure of the body structure. Therefore, pop rivets shall NOT be used in the construction of the structural portions of the body. This includes side body sheets, inner panels of compartment doors, and any other structural portions of the body.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **E-1010 : EXTERIOR ALUMINUM BODY**

The fabrication of the body shall be constructed from aluminum 3003H-14 alloy smooth plate. This shall include compartment front panel, vertical side sheets, side upper rollover panels, rear panels and compartment door frames.

The body compartment floors and exterior panels shall be constructed with not less than 3/16" (.187) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas.

The door side frame openings shall be formed "C" channel design. An electrical wiring conduit raceway running the full length of exterior compartments shall be provided. This raceway shall contain all 12 volt wiring running to the rear of the apparatus, permitting easy accessibility to wiring.

Individual compartment modules, with dead air space voids between compartments, shall not be an acceptable method of compartment construction.

The compartments shall be an integral part of the body construction. Compartment floors from front of body to ahead of rear axle, also from rear axle to rear of body shall be single one-piece sections. Compartment floors shall be preformed, then positioned in body and welded into final position.

Compartment floors shall have a "sweep-out" design with door opening threshold positioned lower than compartment floor, permitting easy cleaning of compartments. Angles, lips, or door moldings are not acceptable in the base of compartment door opening.

All exterior seams in sheet metal below frame, and around the rear wheel well area shall be welded continuous to prevent moisture from entering compartments. All other interior seams and corners shall be sealed with silicone based caulk prior to painting.

Only stainless steel bolts, nuts, sheet metal screws and/or aluminum screws shall be used in mounting exterior trim, hardware and equipment.

Exterior compartments shall have louvers in lower back wall of compartment for ventilation.

#### **E-1020 : ROOF CONSTRUCTION**

The roof shall be integral with the body and shall be all welded construction. The roof of the body shall not be less than 3/16" aluminum 3003H-14 alloy NFPA nonskid compliant tread plate, fully and continuously welded. The roof shall be reinforced with 2" x 2" x 1/4" aluminum tubing running the full width of the body. A 2" rounded radius shall be provided along the body sides.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **E-1030 : BODY SUBFRAME**

To assure proper body alignment and clearance, the body subframe shall be constructed directly on the chassis.

The chassis frame rails shall be fitted with 1/4" custom extruded UHMW polyethylene rail cap to isolate the body frame members from direct contact with chassis frame rails.

The body subframe shall be constructed from 6061T6 aluminum alloy tubing. Subframe shall consist of two (2) 2" x 6" x 1/4" aluminum tubes, the same width as the chassis frame rails, NO EXCEPTION. Welded to this tubing shall be crossmembers of 2" x 6" x 1/4" aluminum. These crossmembers shall extend the full width of the body to support the compartments. Crossmembers shall be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum crossmembers shall be located as necessary to support walkway or heavy equipment.

To form the frame, the tubing shall be beveled and welded at each joint using 5356 aluminum alloy welding wire.

#### **E-1040 : BODY MOUNTING**

The body subframe shall be fastened to the chassis frame with a minimum of ten (10) spring loaded body mounts. Each mount shall be configured using a two-piece encapsulated slide bracket. The two (2) brackets shall be fabricated of heavy duty 1/4" thick steel and shall have a powder coat finish to prevent any corrosion. Each mounting assembly shall utilize two (2) 3/4" diameter x 6" long grade 8 bolts and two (2) heavy duty springs. The assembly design shall allow the body and subframe to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall eliminate any stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement.

Body mountings that do not allow relief from chassis movement will not be acceptable.

#### **E-1050 : 17" REAR STEP BUMPER**

The full width rear bumper shall be constructed from 2" x 2" x 1/4" aluminum tubing frame and covered with 3/16" NFPA compliant aluminum tread plate. The bumper shall extend from the rear vertical body panel 17" and provide a rear step with a minimum of 1/2" space at body for water drainage.

#### **E-1060 : REAR TOW EYES**

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the chassis frame and mounted above the rear bumper. The tow eyes shall be fabricated from 1" thick steel plate and shall have a black powder coat finish.

#### **E-1070 : GROUND LIGHTS**

Two (2) OnScene Solutions 9" LED Nightstik ground lights shall be mounted below the rear bumper.

#### **E-1080 : WHEEL WELL EXTERIOR PANEL**

The exterior panel of the body wheel well enclosure shall be constructed from 1/8" aluminum smooth plate.

#### **E-1090 : DIEFORMED BEADED EDGE BODY FENDERS**

A die formed beaded edge shall be provided along the radius of the wheel well opening for a finished appearance.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **E-1100 : WHEEL WELL LINERS**

The wheel wells shall be provided with an easily removable polymer, circular inner fender liner. The inner liner shall be bolted to the wheel well with stainless steel bolts and spaced away from the wheel well so the liner will not accumulate dirt or water.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section F

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### **F-1000 : PAINT FINISH - SINGLE COLOR**

The body shall be painted with a single color of PPG Delfleet® Evolution paint as described above.

Prior to the assembly and reinstallation of exterior components; i.e. warning and DOT lights, handrails, steps, door hardware, and miscellaneous items, an isolation tape, or gasket shall be used to prevent damage to the finish painted surfaces. These components shall be fastened to body using either a plastic insert into body metal with stainless steel screws or zinc coated nutserts into body surface using stainless steel bolts to prevent corrosion from dissimilar metals.

Touch-up paint shall be provided with completed vehicle.

- Paint Color: Match cab/chassis supplied paint color.

### **F-1010 : BODY UNDERCOATING**

The entire underside of apparatus body shall be sprayed with black automotive undercoating. Undercoating shall cover all areas to retard corrosion under the apparatus.

### **F-1020 : UNDERCOAT WARRANTY**

The undercoating shall be provided with a warranty by its manufacturer for the lifetime of the vehicle. The re-spray warranty shall be transferable between vehicle owners. Should the coating applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

### **F-1030 : PAINT WARRANTY**

The vehicle shall be provided with a ten (10) year non-prorated warranty to the original owner. Warranty is provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be provided with the delivered vehicle.

### **F-1040 : COMPARTMENT INTERIOR FINISH**

The interior of all exterior body compartments shall be a "Maintenance Free" smooth unpainted finish. All body seams shall be finished with a caulk sealant for both appearance and moisture protection.

### **F-1050 : NFPA REQUIRED REFLECTIVE STRIPE AND LETTERING**

The apparatus will be striped and lettered as per the HOUSTON FIRE DEPARTMENT's instructions.

The NFPA required reflective striping on all four sides including the rear chevrons shall be furnished and installed by the Body Manufacturer prior to the unit being entered into emergency service.

The final design and layout of the striping and lettering will be determined at the pre-construction meeting.



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section G

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### **G-1000 : EXTERIOR COMPARTMENT DOORS**

#### **G-1010 : HINGED DOOR CONSTRUCTION**

The exterior compartment doors shall be custom manufactured and built for each compartment. The compartment doors must be able to withstand years of rugged service and wear. For this reason, the compartment door design, metal thickness, and attachments must be strictly adhered to.

The compartment doors shall be all aluminum 3003H-14 alloy construction. The exterior panel shall be of 1/8" thickness smooth plate aluminum and the interior panel shall be of 1/8" thickness smooth plate aluminum. Lighter gauge material will NOT BE ACCEPTABLE in these areas. The double panel doors shall be 1-3/4" thick to completely enclose the door latching assembly. Doors shall have drain hole openings for drainage and ventilation.

The doors shall be flush mounted so that the outer surface is in line with the side body surface. Lap or bevel type constructed doors, doors framed with extrusions, or doors requiring rubber bumpers to prevent unnecessary contact are NOT ACCEPTABLE.

Compartment door openings shall be sealed with closed cell automotive type rubber molding to provide a weather resistant seal around door. In addition, rubber molding shall be provided along hinge to prevent moisture entry. Open cell foam type rubber moldings are NOT ACCEPTABLE.

Hinged compartment doors shall have 14 gauge stainless steel hinge, with 1/4" stainless steel pin. The hinge shall be bolted to the door and body with stainless steel machine screws. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary.

Drip rails shall be installed above all compartment door openings. Drip rails shall be completely removable for easy replacement if necessary.

The latching mechanism of hinged compartment doors shall include stainless steel 6" Hansen offset bent D-ring keyed handles. A gasket shall be placed between stainless steel handle and door. Door latches shall be a double catching two-point rotary slam latch, recessed inside the double panel door with striker plate.

All vertically hinged compartment doors shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door. Door checks that require unlatching by hand will NOT BE ACCEPTABLE. All horizontally hinged compartment door shall have a door check as specified with each door.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **G-1020 : BODY WIDTH DIMENSIONS**

The body shall be 100.0" wide, not including drip rail or non-permanent fixtures. Interior compartment depth dimensions shall be:

<u>Area Description</u>	<u>Dimension</u>
Transverse Area:	95.5"
- Above Top of Subframe	
Compartment Depth:	24.5"
- Below Top of Subframe	
- Ahead of Rear Axle	
Compartment Depth:	23.5"
- Below Top of Subframe	(Eng. Note)
- Behind the Rear Axle	

(Dimensions are generic and subject to change during the actual design process)

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section H

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### H-1000 : STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment space shall be approximately 43" wide.

The compartment door opening shall be approximately 14.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### COMPARTMENT COMPONENTS

- There shall be two (2) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. **NOTE:** Mounted on this tray will be all six (6) chassis batteries
  - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/yellow in color.
- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- Six (6) chassis batteries will be located in front of Compartment S1. Batteries will be accessed through the compartment door. The batteries shall be mounted in a stainless steel pan with hold down provisions for mobile application.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- The 12 volt electrical distribution panel shall be located in the streetside front lower compartment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **H-1010 : STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)**

The interior useable compartment space shall be approximately 43" wide.

The compartment door opening shall be approximately 14.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### **COMPARTMENT COMPONENTS**

There shall be (1) Cruise-Air A/C condenser located in this compartment

- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **H-1020 : STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S3)**

The interior useable compartment space shall be approximately 43" wide.

The compartment door opening shall be approximately 14.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### **COMPARTMENT COMPONENTS**

- There shall be two (2) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits.
  - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the tray. The striping shall be 2" wide and red/yellow in color.
- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- Location for specified inverter and deep cycle batteries. The batteries shall be mounted in a stainless steel pan with hold down provisions for mobile application.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### H-1030 : STREETSIDE COMPARTMENT - REAR (S4)

The interior useable compartment width shall be approximately 64" wide.

The compartment door opening shall be approximately 13.5" wide.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### COMPARTMENT COMPONENTS

- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- The FRC FROG-D generator gauge panel.
- A 100 ampere, 240 VAC, single phase shore power receptacle shall be located in this compartment.
- A Cast Products door will be mounted on the floor of the compartment to allow a shore power cable to be ran up through the floor while the exterior compartment door is closed. **NOTE:** The Cast Products door will be tied into transmission interlock to prevent movement of the truck while the door is open.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **H-1040 : CURBSIDE COMPARTMENT - FRONT (C1)**

The interior useable compartment space shall be approximately 39" wide.

The compartment door opening shall be approximately 14.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### **COMPARTMENT COMPONENTS**

- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- The cab tilt control pendant.
- One (1) 120/240 VAC load center.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **H-1050 : CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)**

The interior useable compartment space shall be approximately 59" wide.

The compartment door opening shall be approximately 14.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### **COMPARTMENT COMPONENTS**

- There shall be one (1) Cruise-Air A/C condenser located in this compartment.
- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.



# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **H-1060 : CURBSIDE BODY ENTRY DOOR**

Access to the interior body compartment shall be provided through a curbside entry door, directly in front of the rear axle. The door opening shall be approximately 31" wide x 94" high.

Construction of the side entry door shall be with 1/8" aluminum exterior smooth plate, the interior door pan being constructed from 1/8" aluminum tread plate.

The door shall be hung on full height 14 gauge stainless steel hinge, with a 1/4" stainless steel pin. The hinge shall be bolted to the door and body with stainless steel machine screws at offset 5" centers. The hinge shall be slotted horizontally and vertically for ease of adjustment. A polyester barrier film gasket shall be placed between the stainless steel hinge and door.

The latch mechanism shall include a paddle handle on both the inside and exterior. A polyester barrier film gasket shall be placed between the stainless steel handles and the aluminum door panels. The door latch shall be a double catch two-point safety slam latch recessed inside the double panel door with strike plate mounted top and bottom of door frame.

- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the side entrance door step.

## **H-1070 : ENTRY HANDRAILS**

There shall be two (2) handrails provided at entry door, one (1) vertical on exterior of body on door handle side, and one (1) on inside of door. The interior handrail shall be angled for optimum use when entering or exiting the walk-in portion of the body.

Handrails shall be NFPA compliant 1-1/4" extruded aluminum tubing with chrome plated end stanchions.

## **H-1080 : ELECTRIC STEP**

One (1) heavy duty, Ziamatic Quik-Step, 12 volt electric folding step shall be located under the command area access door. The step shall be 24" wide and fold up under body to reduce ground clearance. The step shall fold out and down to reduce the ground to step distance.

## **H-1090 : WINDOW(S)**

There shall be one (1) 18" wide x 22" high non-sliding window(s) installed in the entrance door. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

## **H-1100 : WINDOW(S)**

There shall be one (1) 18" wide x 22" vertical sliding window(s) installed in the entrance door. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

## **H-1110 : BODY ENTRANCE STEP COVER**

A swing down type step cover fabricated from 3/16" NFPA approved treadplate will be provided at the side entrance to the apparatus body. The hinged step cover will be securely fasten up to allow access to the body and when manually swung down, provide a flush cover over the body entrance steps to provide a safe walking surface when the entrance door is close.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **H-1120 : ELECTRIC COMBINATION SIDE ENTRANCE DOOR LOCK**

The side entrance door will be provided with a 12 volt electric key pad lock for coded entrance.

This door will be locked and unlocked separately from the cab/chassis doors.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **H-1130 : CURBSIDE COMPARTMENT - REAR (C3)**

The interior useable compartment width shall be approximately 64" wide.

The compartment door opening shall be approximately 13.5" high.

This compartment shall have a horizontally hinged box pan style door fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door(s) shall have a stainless steel 6" Hansen offset bent D-ring locking handle. A gasket shall be placed between stainless steel handle and door. Door latches shall be a two-point (top and top) rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.

#### **COMPARTMENT COMPONENTS**

- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- One (1) OnScene Solutions 9" LED Nightstik ground light shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in lower compartment.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section I

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### **I-1000 : PLASTIC FLOOR AND SHELF TILE**

All compartment floors, shelves, and trays shall be covered with Turtle Tile plastic interlocking grating.

- The plastic floor tile shall be red
- The plastic edge trim shall be yellow.

### **I-1010 : SIDE BODY PROTECTION - RUB RAIL**

There shall be side rub rails provided below the compartment door openings on both the streetside and curbside. The rub rail shall be fabricated from 6063 extruded aluminum, measuring approximately 2-3/4" high x 1-3/8" thick with tapered aluminum end caps. The rub rail shall be bolted to the body using stainless steel bolts and 1-1/2" diameter x 5/8" thick rubber mount isolators to prevent damage to the body. The rails shall incorporate LED clearance marker lighting recessed into the rail fascia to avoid damage to the light in case of impact. The rub rail shall have an accessory mounting track integrated into the backside of the rail to allow mounting of accessories such as ground lighting.

- 3M™ Diamond Grade™ Conspicuity striping shall be provided in the rub rail. The striping shall be red/yellow in color.

### **I-1020 : ROLL-OUT AWNING CURBSIDE**

A Carefree Mirage, 110 Volt AC powered, Lateral Arm Acrylic Patio Awning with Direct Response Electronics shall be installed on the apparatus body. The Direct Response Electronics includes easy-to-use controls and a Motion Detection System. The awning shall have a system to detect canopy motion, the most important element to prevent wind/weather damage. The awning shall automatically retract when the canopy reaches a certain level of movement - you determine the movement level on the control panel.

The awning shall activate the door ajar warning system in the cab when not in the stowed position.

The 110V motor shall be completely sealed and UL approved. The awning pitch shall be adjusted to up to 30"

The awning shall match the width of the streetside slide-out in wide with a 10' projection. (Size refers to box length, actual fabric length will be 8" shorter.)

The Mirage shall be covered by a "Two and Four" Limited Warranty - Two (2) years 100% parts, labor, & freight on canopy, four (4) years 100% parts, labor, and freight on motor, electronics, roller & hardware. Warranty covers manufacturer's defects only. Wind and rain damage are not covered.

**Note:** Umbilical awning controls to both bring in and out will be the same external umbilical control that is used for the slide outs.

### **I-1030 : AWNING HOUSING**

The case color will be the standard, Polar White and re-painted to match body color.

- The awning fabric shall be Firesist HUV, Ivory (88054).

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **I-1040 : GREEN STROBE ON EXTENDABLE FRC POLE**

One (1) Whelen green strobe light on a manual extendable 8' foot FRC pole. The light shall be located on the rear of body within close proximity to the rear ladder. The green strobe light shall not extend past the top of the body when in the nested position. The strobe light shall be wired so that it automatically activates when pole is extended. The pole shall be wired into chassis warning system to indicate that it is not properly nested prior moving the apparatus.

## **I-1050 : ROOF ACCESS LADDER**

The ladder shall be weld constructed of vertical aluminum extrusion tubing and aluminum grip surface ladder rungs with slip resistant tread grip pattern. It shall be set off from body 8 inches and mounted to body with chrome plated end stanchions bolted to the body with stainless steel bolts. The ladder shall NOT extend above the body roof. The location shall be on the rear curbside of the apparatus body.

## **I-1060 : ROOF ACCESS HANDRAIL**

There shall be two (2) handrails mounted on top of body to assist in roof access. Handrails shall be NFPA compliant 1-1/4" extruded aluminum tubing with chrome plated end stanchions.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section J

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### **J-1000 : COMPARTMENT COMPONENTS DESCRIPTIONS**

All interior compartment components shall be fabricated as follows:

### **J-1010 : ADJUSTABLE SHELVING HARDWARE**

Adjustable shelving hardware shall be provided indicated in the numbered compartment list.

The shelving hardware shall include a minimum of four (4) aluminum shelf tracs mounted vertically on compartment side walls or vertical partitions. There shall be one (1) cast aluminum shelf bracket per vertical shelf trac to mount each shelf, tray, or adjustable storage module. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

### **J-1020 : ADJUSTABLE SHELF/SHELVES**

Adjustable shelf/shelves shall be provided in exterior compartment as indicated in the numbered compartment list.

Shelves shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate with a 2" vertical flange along the front and rear edges. Shelves shall be designed to be used with a flange in the upward position to hold various equipment on shelf.

All shelves shall be fully adjustable, from top to bottom of the compartment. There shall be at least four (4) vertical mounting channels and shelving hardware, two (2) each side of compartment. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

### **J-1030 : HEAVY DUTY 100% EXTENSION EQUIPMENT SLIDE - (1,000 LB. CAPACITY)**

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with a 4" high vertical lip with welded corners to form a box type tray surface. The tray shall be mounted on a slide frame constructed of anodized aluminum extrusion(s). The frame shall be assembled using stainless steel fasteners (no welds). Each slide shall use a three extrusion rail design utilizing twelve to sixteen (12 - 16) urethane rollers. Each roller shall contain two (2) precision roller bearings mounted in an aluminum hub with a molded on urethane cover. The rollers shall not lose contact with the rail extrusion during operation of the slide unit. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release). The slide shall lock in the closed and full extension positions. The slide shall be rated for a maximum evenly distributed load of 1,000 lbs.

### **J-1040 : REFRIGERATOR**

A Norcold DE-0041R 120VAC/12VDC refrigerator/freezer shall be provided in the body interior as indicated in the numbered compartment list. Unit shall be a flush mount style with a custom enclosure. Refrigerator shall operate from both 12 VDC and 120 VAC power. The built-in dimensions are approximately 30-7/8" high x 23-1/4" wide x 23-1/2" deep.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **J-1050 : COMPARTMENT LIGHTING**

Each enclosed equipment compartment greater than 4 ft<sup>3</sup> (0.1 m<sup>3</sup>) in volume and having an opening greater than 144 in.<sup>2</sup> (92,900 mm<sup>2</sup>) shall have sufficient compartment lighting to provide a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any shelves, dividers, or equipment in the compartment.

Compartments such as ladder tunnels, pike pole storage tubes, or underbody compartments designed around the volumetric requirements of specific equipment that can be removed without the use of article illumination shall not be required to have compartment lighting.

All compartments shall be equipped with OnScene Nightstik LED lights with the following minimum light requirements;

- Full Height Compartments, 54" Section (36 LED's)
- Wheel well Compartments, 36" Section (24 LED's)
- Rear Rescue Compartment, 54" Section (36 LED's)
- Low Compartments, 18" Section (12 LED's), Vertical
- Low Compartments, 36" Section (24 LED's), Horizontal

The OnScene Nightstik lights shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty.

#### **J-1060 : STEP / GROUND LIGHTS**

Step and ground lights shall be OnScene Solutions 9" LED Nightstik and be placed at any entry door and step where personnel climb on or descend from the apparatus to ground level. OnScene LED lights shall have 6 LED lights per 9" light, and shall be rated at 100,000 hours of service. On Scene Solutions LED lights shall have a 5 year free replacement warranty.

All of the required step and ground lights shall be activated when the parking brake is set.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section K

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### **K-1000 : WALK-IN INTERIOR FINISH DETAILS**

#### **K-1010 : INTERIOR INSULATION**

Following the sheet metal fabrication the roof area, upper exterior walls and the entry door of the apparatus body shall be insulated with 1-1/2" rigid polyurethane foam insulation. This insulation shall be the type that will not absorb moisture, move once in place or deteriorate. Mat type fiberglass or spray in foam insulation are not acceptable.

#### **K-1020 : INTERIOR FINISH**

The interior of the apparatus body shall have a fully maintenance free and durable finish. The interior finish shall be installed on the ceiling, front wall, and interior side walls from top of exterior compartments to ceiling height.

The interior panels shall be installed with sheet metal screws with white plastic plugs covering the screws. The seams between FRP panels, interior corners, and exterior corners shall be trimmed with white plastic molding.

The interior finish shall be bright white pebble grain FRP.

#### **K-1030 : INTERIOR WALKWAY FLOOR**

There shall be Lonseal, Loncoin-II Flecks installed on the floor substrate. Loncoin II Flecks is a heterogeneous resilient sheet vinyl with a decorative raised coin texture, breathtaking color, and intriguing style. The fleck coloration provides camouflage for simpler maintenance while the raised coin embossing provides enhanced traction. Excellent for interior, retail, commercial, or institutional use where design parameters call for a high performance, sophisticated flooring solution.

Loncoin II Flecks is composed of polyvinyl chloride (PVC) resin, plasticizers, fillers, and pigments. The co-calendared wear layer is formulated to provide maximum resistance to foot traffic and most commercial and healthcare chemicals.

The middle layer provides dimensional stability, sound-absorbing properties, and resiliency under foot. The backing layer provides strength and stability of the flooring and enhances the bonding strength of the adhesive.

The material shall be black in color (Loncoin-II Flecks - Onyx).

Lonseal, Inc. warrants that Lonseal flooring products shall be free from manufacturing defects for a period of one (1) year from the date of purchase and that, when properly installed and maintained, shall not wear through as a result of normal foot traffic for a period of 7 years from the date of installation.

#### **K-1040 : INTERIOR SUB-FLOOR**

Above the body subframe shall be an isolation sheet that shall prevent outside elements from permeating the full length sound and thermal barrier of 3/4" thick grade plywood. The sheet shall be fabricated from the same type of material as is used in the subframe. The isolation sheet shall be flanged on both sides with a 1" high vertical break.



# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **K-1050 : FRONT WALL INTERIOR AREA**

### **K-1060 : SMART BOARD**

A specified Smart Board will be mounted on the front interior wall of the body.

### **K-1070 : 120 VOLT FRONT WALL INTERIOR OUTLETS**

There shall be two (2) 120 volt outlet(s) located on the front wall of the walk-in area of the body.

- The receptacle shall be 20 amp, straight-blade ( NEMA 5-20R ).

### **K-1080 : MAGNETIC WHITEBOARDS**

There shall be two (2) magnetic whiteboard surfaces mounted on the front wall of the walk-in interior. Location and size to be determined at the preconstruction meeting.

### **K-1090 : TECH RACK (LOCATION ONLY)**

There shall be two (2) half height tech racks located in this area. Model and functions of these tech racks can be found in the technical section of this spec.

### **K-1100 : AIR CONDITIONER - HEATER**

The apparatus body shall be supplied with one (1) air conditioning/heater unit. The unit shall be mounted in a manner to allow ducting of the air flow with a Hoseline brand evaporator.

The unit shall have a rating of 24,000 btu cooling capacity with a heating element rated at 36,000 btu heating. A 12 volt 3-speed fan shall supply a minimum of 650 cfm air flow.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **K-1110 : STREETSIDE INTERIOR AREA (IS1/IS2)**

#### **K-1120 : FLAT FLOOR SLIDE-OUT EXTENSION**

There shall be one (1) "slide-out" section(s) which shall extend approximately 32" as measured from the outside of the body. The extendable module shall be approximately 137" in length and 81" high. The interior height shall be approximately 9" less than the interior height of the body walkway. The installed module shall provide a water tight seal in both the fully extended and the retracted positions.

The slide-out section shall utilize smooth operating hydraulic system. The slide-out will be flat floor design.

The slide-out section shall be framed with 2" x 2" x 1/4" 6061-T6 alloy aluminum. The frame structure shall be covered with no less than 1/8" thick 3003-H14 smooth aluminum.

Full width padded foam cushion head bumpers shall be provided in the slideout. Head bumpers shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one at each end of the slide-out section. The lights shall activate and be visible when the unit is extended.

All electrical wiring installed in the slide-out wall shall run through a boxed type conduit at the lower corner of the system. All wiring shall be enclosed in a flexible, moisture resistant, reinforced conduit, with proper seal tight connectors and hardware. Access shall be provided for inspection of all wiring and the gear and rack mechanism.

The Command Center "Slide-out" must be able to withstand years of rugged service and wear. For this reason, this design, metal thickness and attachments must be strictly adhered to. RV type slide-outs or slide-outs using light weight metal or fiberglass shall not be acceptable.

NOTE: The slide outs shall be controlled as follows: (1) umbilical on the rear of the truck to allow function of all (4) slide outs to move out only, locate switches on the inside to bring the slide outs in only.

#### **K-1130 : SLIDE-OUT SIDE WINDOWS**

There shall be two (2) 18" wide x 22" high non-sliding window(s) installed one (1) on each side of the specified slide-out wall. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

#### **K-1140 : INTERIOR SLIDE-OUT WINDOW COVERS**

An interior window cover shall be provided on the two (2) windows in the slide-out wall.

The window covers shall be of Cover Lite Select, 22 oz material. Snap type fasteners shall be installed around each window in the body to allow each window to be covered.

#### **K-1150 : INTERIOR CABINET - OVERHEAD**

There shall be three (3) overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray. Each cabinet shall be approximately 42" wide x 14" high x 14" deep.

The above cabinet(s) shall have lift-up type door(s) with dry-erase outer surface.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1160 : SLIDE-OUT AREA - FULL WIDTH DESK**

The slide-out area shall be provided with a full width desk which shall be 24" deep and located approximately 30" from floor. The front edge of the desk top shall be reinforced with 2" x 2" tubing in order to support a person sitting on the edge of the desk.

The desk top surface shall be fabricated of 3/16" smooth finish aluminum. It shall have a 2" vertical downward edge along front to cover the 2" x 2" reinforcement. There shall be 2-1/2" diameter holes with plastic edge grommet provided at each rear corner for wiring of future equipment located under desktop component console. The desk shall be painted with a dark gray hammer tone powder coat paint finish for a hard and durable surface.

Install desktop PC and Radio Base units under the desk to the street side wall. These components will be mounted to reinforced area.

#### **K-1170 : DESKTOP COMPONENT CONSOLE**

There shall be a console at top rear of the desk for optional component mounting. The console shall be fabricated from 1/8" aluminum approximately 6" high x 9" deep with a 6" sloping component mounting face. The console shall be painted dark gray with a hammer tone powder coat paint finish for a hard and durable surface.

The sloped component mounting surface shall be a one-piece hinged cover to allow access to optional components, and wiring and held closed with knurled thumb type latch in each corner.

- There shall be three (4) phones mounted in the front face of the component console
- There shall be two (2) duplex data port(s) provided in the front face of the component console.
- There shall be two (2) 12V outlet(s) provided in the front face of the component console.
- There shall be one (2) 120 volt, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided in the front face of the component console

#### **K-1180 : INTERIOR SEATS**

Four (4) Herman Miller, highly adjustable Aeron Roll-Around Chairs furnished and installed in the body command area slide out.

Each chair shall have a Kinemat tilt mechanism that allows the body to pivot naturally and simultaneously at the ankles, knees, and hips providing a smooth ride and proper support from forward-leaning to reclining postures.

There shall be lumbar adjustment vertically through 4 1/2-inch height range. Its depth can be set at 3/4 inch or 1 1/4 inches.

There shall be a suspension system fabricated from unique Pellicle material; the Aeron chair distributes weight evenly over the seat and back, conforming to each person's shape. The material also lets air pass through, adding to long-term comfort by preventing body-heat build-up.

The armrests shall be independently adjustable with settings that pivot inward 17.5 degrees for keying and outward 15 degrees. Arm height adjusts independently within a four-inch vertical range.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1190 : 120 VOLT UNDER DESK OUTLET (PC POWER)**

Four (4) 120 volt, 20 amp, straight-blade (NEMA 5-20R) outlets will be provided under the desk top surface. The outlets will be powered by the specified inverter. **Note:** These outlets are to be red in color.

#### **K-1200 : FORWARD CONFERENCE TABLE**

A conference table will be provided in the forward conference area of the body. The table will be fabricated with 1/8" Aluminum with a gray powder coated finish top matching the specified workstation desktops. This conference table will be both removable and adjustable in height.

#### **K-1210 : STREETSIDE INTERIOR AREA (IS4)**

#### **K-1220 : GALLEY MICROWAVE**

There shall be one (1) commercial grade microwave oven furnished and installed in the upper storage compartment. The unit shall be a 1000-watt minimum with stainless steel cabinet. The built-in dimensions shall be 12" high x 20-1/2" wide x 16" deep.

#### **K-1230 : GALLEY REFRIGERATOR**

There shall be one (1) Norcold DE-0041R 120VAC/12VDC refrigerator/freezer(s) furnished and installed in the galley. The unit shall be a flush mount style box with Body Manufacturer fabricated custom enclosure. Each refrigerator shall operate from 12 volt or 120 volt power. The built-in dimensions are 30-7/8" high x 23-1/4" wide x 23-1/2" deep.

- One (1) 120 volt, 20 amp, straight blade outlet behind the microwave.
- One (1) 120 volt, 20 amp, straight blade outlet behind the refrigerator.
- One (1) 120 volt, 20 amp, GFI straight blade outlet in the overhead cabinet.

#### **K-1240 : GALLEY INTERIOR LIGHT FIXTURE**

There shall be one (1) 120/12 volt On Scene Solutions LED interior, over counter, light fixture(s) installed above the galley countertop and below the overhead cabinet. Fixture shall be provided with single bulb and switch on fixture.

#### **K-1250 : AIR CONDITIONER - HEATER**

The apparatus body shall be supplied with one (1) air conditioning/heater unit(s). Each unit shall be mounted in a manner to allow ducting of the air flow with a Hoseline brand evaporator.

Unit shall have a rating of 24,000 btu cooling capacity with a heating element rated at 36,000 btu heating. A 12 volt 3 speed fan shall supply a minimum of 650 cfm air flow.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### K-1260 : MIDDLE ATLANTIC 40U DATA RACK

There shall be an EIA compliant 19" gangable equipment rack, Middle Atlantic Products model # MRK-4031.

Overall dimensions shall be 76.125"H x 22.0"W x 26.4"D. Useable height shall be 40 rack spaces, useable depth shall be 24". Fully welded construction shall provide a static capacity of 10,000 lbs. and a UL Listed load capacity of 2,500 lbs.

Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel, rear door shall be 18-gauge steel and all structural elements shall be finished in a durable black powder coat.

Rack shall come equipped with two (2) pairs of 11-gauge steel rack rail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rack spaces.

Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae.

Solid front door with black textured powder coat finish and keylock. The door is capable of hinging on either the left or the right of the rack.

Integrated fan top includes 4.5" fans, fan guards and proportional speed thermostatic fan controller.

The PD-920R-NS rackmount power distribution unit is equipped with 8 circuit breaker protected rear outlets (NEMA 5-20R), and one front outlet (NEMA 5-15R). An illuminated combination power switch/circuit breaker is located on the front panel. UL listed in the US and Canada. Occupies one rackspace.

The APC Uninterruptible Power Supply (UPS) provides protection for electronic equipment from utility power blackouts, brownouts, sags and surges. The UPS filters small utility line fluctuations and isolates electronic equipment from large disturbances by internally disconnecting from utility line power. The UPS provides continuous power from the batteries until utility power returns to safe levels or the batteries are fully discharged.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1270 : STREETSIDE INTERIOR AREA (IS5)**

#### **K-1280 : FLAT FLOOR SLIDE-OUT EXTENSION**

There shall be one (1) "slide-out" section(s) which shall extend approximately 32" as measured from the outside of the body. The extendable module shall be approximately 118" in length and 75" high. The interior height shall be approximately 9" less than the interior height of the body walkway. The installed module shall provide a water tight seal in both the fully extended and the retracted positions.

The slide-out section shall utilize smooth operating hydraulic system. The slide-out will be flat floor design.

The slide-out section shall be framed with 2" x 2" x 1/4" 6061-T6 alloy aluminum. The frame structure shall be covered with no less than 1/8" thick 3003-H14 smooth aluminum.

Full width padded foam cushion head bumpers shall be provided in the slideout. Head bumpers shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one at each end of the slide-out section. The lights shall activate and be visible when the unit is extended.

All electrical wiring installed in the slide-out wall shall run through a boxed type conduit at the lower corner of the system. All wiring shall be enclosed in a flexible, moisture resistant, reinforced conduit, with proper seal tight connectors and hardware. Access shall be provided for inspection of all wiring and the gear and rack mechanism.

The Command Center "Slide-Out" must be able to withstand years of rugged service and wear. For this reason, this design, metal thickness and attachments must be strictly adhered to. RV type slide-outs or slide-outs using light weight metal or fiberglass shall not be acceptable.

**NOTE:** The slide-outs shall be controlled as follows: One (1) umbilical on the rear of the truck to allow function of all four (4) slide-outs to move out only, locate switches on the inside to bring the slide-outs in only.

#### **K-1290 : SLIDE-OUT SIDE WINDOWS**

There shall be two (2) 18" wide x 22" high non-sliding window(s) installed one (1) on each side of the specified slide-out wall. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

#### **K-1300 : INTERIOR SLIDE-OUT WINDOW COVERS**

An interior window cover shall be provided on the two (2) windows in the slide-out wall.

The window covers shall be of Cover Lite Select, 22 oz material. Snap type fasteners shall be installed around each window in the body to allow each window to be covered.

#### **K-1310 : INTERIOR CABINET - OVERHEAD**

There shall be three (3) 26" wide overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray.

The above cabinet(s) shall have lift-up type door(s) with dry-erase outer surface.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1320 : UNDER CABINET, RADIO MOUNTING CONSOLE**

There shall be one (1) under cabinet mounted radio/communication consoles provided in the interior. The radio cabinet shall provide mounting area for the radios specified.

The radio cabinet shall be constructed of 1/8" smooth finish aluminum and painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray or black. The front of the cabinet shall have standard bolt-on 8-1/2" x 3" black radio trim mounting plates. A hinged 3/16" aluminum drop down access cover shall be provided on the bottom to access equipment mounting and wiring with 1/4 turn knobs to secure cover closed. Ventilation louvers shall be provided for proper ventilation of radio equipment.

Each cabinet shall be a minimum of 4" high x 14" deep. The width of each cabinet shall be (insert actual dimensions) and located under overhead cabinets.

#### **K-1330 : SLIDE-OUT AREA - FULL WIDTH DESK**

The slide-out area shall be provided with a full width desk which shall be 17" deep and located approximately 30" from floor. The front edge of the desk top shall be reinforced with 2" x 2" tubing in order to support a person sitting on the edge of the desk.

The desk top surface shall be fabricated of 3/16" smooth finish aluminum. It shall have a 2" vertical downward edge along front to cover the 2" x 2" reinforcement. There shall be 2-1/2" diameter holes with plastic edge grommet provided at each rear corner for wiring of future equipment located on the desk top. The desk shall be painted with a dark gray hammer tone powder coat paint finish for a hard and durable surface. There shall be (2) 3" cord drop holes located on the desk top surface, locate (1) in between each of the three (3) seated positions.

Install Radio Base units under the desk to the street side wall. These components will be mounted to reinforced area.

#### **K-1340 : WALL OUTLETS**

- There shall be two (2) phones mounted in the wall service.
- There shall be three (3) data port(s) provided in the wall surface.
- There shall be two (2) 12 volt duplex outlet(s) provided in the wall surface.
- There shall be two (2) 120 volt, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided under the desk top area on the streetside wall. **Note:** One (1) of these outlets below the desk surface will be wired into the inverter. A red cover will be used to indicate that this outlet is wired into inverter.
- One (1) 120 VAC outlet strip(s) approximately 2' long with straight blade household type outlets with a full length trough, extending from the rear wall approx 5" with a 1" lip to contain loose wiring that plugs into the outlet strip

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1350 : INTERIOR SEATS**

Three (3) Herman Miller, highly adjustable Aeron Roll-Around Chairs furnished and installed in the body command area slide out.

Each chair shall have a Kinemat tilt mechanism that allows the body to pivot naturally and simultaneously at the ankles, knees, and hips providing a smooth ride and proper support from forward-leaning to reclining postures.

There shall be lumbar adjustment vertically through 4 1/2-inch height range. Its depth can be set at 3/4 inch or 1 1/4 inches.

There shall be a suspension system fabricated from unique Pellicle material; the Aeron chair distributes weight evenly over the seat and back, conforming to each person's shape. The material also lets air pass through, adding to long-term comfort by preventing body-heat build-up.

The armrests shall be independently adjustable with settings that pivot inward 17.5 degrees for keying and outward 15 degrees. Arm height adjusts independently within a four-inch vertical range.

Add magnetic white dry erase board to overlay the FRP see Pre con sales drawing for approximate layout and dimensions.

#### **K-1360 : CURBSIDE INTERIOR AREA (IC1/IC2)**

##### **K-1370 : FLAT FLOOR SLIDE-OUT EXTENSION**

There shall be one (1) "slide-out" section(s) which shall extend approximately 32" as measured from the outside of the body. The extendable module shall be approximately 106" in length and 81" high. The interior height shall be approximately 9" less than the interior height of the body walkway. The installed module shall provide a water tight seal in both the fully extended and the retracted positions.

The slide-out section shall utilize smooth operating hydraulic system. The slide-out will be flat floor design.

The slide-out section shall be framed with 2" x 2" x 1/4" 6061-T6 alloy aluminum. The frame structure shall be covered with no less than 1/8" thick 3003-H14 smooth aluminum.

Full width padded foam cushion head bumpers shall be provided in the slideout. Head bumpers shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one at each end of the slide-out section. The lights shall activate and be visible when the unit is extended.

All electrical wiring installed in the slide-out wall shall run through a boxed type conduit at the lower corner of the system. All wiring shall be enclosed in a flexible, moisture resistant, reinforced conduit, with proper seal tight connectors and hardware. Access shall be provided for inspection of all wiring and the gear and rack mechanism.

The Command Center "Slide-out" must be able to withstand years of rugged service and wear. For this reason, this design, metal thickness and attachments must be strictly adhered to. RV type slide-outs or slide-outs using light weight metal or fiberglass shall not be acceptable.

**NOTE:** The slide-outs shall be controlled as follows: (1) umbilical on the rear of the truck to allow function of all four (4) slide-outs to move out only, locate switches on the inside to bring the slide-outs in only.



# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **K-1380 : SLIDE-OUT SIDE WINDOWS**

There shall be two (2) 18" wide x 22" high non-sliding window(s) installed one (1) on each side of the specified slide-out wall. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

## **K-1390 : INTERIOR SLIDE-OUT WINDOW COVERS**

An interior window cover shall be provided on the two (2) windows in the slide-out wall.

The window covers shall be of Cover Lite Select, 22 oz material. Snap type fasteners shall be installed around each window in the body to allow each window to be covered.

## **K-1400 : INTERIOR CABINET - OVERHEAD**

There shall be three (3) 26" wide overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray.

The above cabinet(s) shall have lift-up type door(s) with dry-erase outer surface.

## **K-1410 : SLIDE-OUT AREA - FULL WIDTH DESK**

The slide-out area shall be provided with a full width desk which shall be 24" deep and located approximately 30" from floor. The front edge of the desk top shall be reinforced with 2" x 2" tubing in order to support a person sitting on the edge of the desk.

The desk top surface shall be fabricated of 3/16" smooth finish aluminum. It shall have a 2" vertical downward edge along front to cover the 2" x 2" reinforcement. There shall be 2-1/2" diameter holes with plastic edge grommet provided at each rear corner for wiring of future equipment located under the desk top component console. The desk shall be painted with a dark gray hammer tone powder coat paint finish for a hard and durable surface.

Install desktop PC and Radio Base units under the desk to the street side wall. These components will be mounted to reinforced area.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1420 : DESKTOP COMPONENT CONSOLE**

There shall be a console at top rear of the desk for optional component mounting. The console shall be fabricated from 1/8" aluminum approximately 6" high x 9" deep with a 6" sloping component mounting face. The console shall be painted dark gray with a hammer tone powder coat paint finish for a hard and durable surface.

The sloped component mounting surface shall be a one-piece hinged cover to allow access to optional components, and wiring and held closed with knurled thumb type latch in each corner.

- There shall be three (3) phones mounted in the front face of the component console
- There shall be three (3) data port(s) provided in the front face of the component console.
- There shall be two (2) 12V outlet(s) provided in the front face of the component console.
- There shall be three (3) 120 volt, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided at the desk top area on the curbside wall. **Note:** One (1) of these outlets below the desk surface will be wired into the inverter. A red cover will be used to indicate that this outlet is wired into inverter.

#### **K-1430 : INTERIOR SEATS**

Three (3) Herman Miller, highly adjustable Aeron Chairs furnished and installed in the body command area slide out.

Each chair shall have a Kinemat tilt mechanism that allows the body to pivot naturally and simultaneously at the ankles, knees, and hips providing a smooth ride and proper support from forward-leaning to reclining postures.

There shall be lumbar adjustment vertically through 4 1/2-inch height range. Its depth can be set at 3/4 inch or 1 1/4 inches.

There shall be a suspension system fabricated from unique Pellicle material; the Aeron chair distributes weight evenly over the seat and back, conforming to each person's shape. The material also lets air pass through, adding to long-term comfort by preventing body-heat build-up.

The armrests shall be independently adjustable with settings that pivot inward 17.5 degrees for keying and outward 15 degrees. Arm height adjusts independently within a four-inch vertical range.

There shall be a side entry door located in this area.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1440 : CURBSIDE INTERIOR AREA (IC4)**

#### **K-1450 : ROOF HATCH WITH SKYLIGHT**

The apparatus roof area shall be specially reinforced for the installation of a hatch with skylight. The opening shall be approximately 24" x 24" in size, suitable for use as an escape hatch, for ventilation, and supplemental light in the interior of the apparatus. The skylight shall have tinted glass providing UV protection. Two (2) compression type door checks are used to hold door in open position.

#### **K-1460 : SLIDING POCKET DOOR**

There shall be one (1) sliding pocket door(s) provided on interior of walk-in body area. Pocket door shall be fabricated from 1/8" smooth aluminum and be approximately 1-1/2" thick and hang on adjustable pocket door hardware. The door shall be painted to match the interior wall color. A stainless steel handle shall be provided on each side of door. The door shall be equipped with a pneumatic cylinder which will "over-center" to hold the door in open and closed positions.

#### **K-1470 : INTERIOR CABINET - COUNTER HEIGHT**

There shall be one (1) interior counter height cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray. Each cabinet shall be approximately (insert actual dimensions).

- The above cabinet(s) shall have a 4" x 4" toe kick area at the base to allow for the top surface to be used as a working surface.
- The above cabinet(s) shall have a vertically hinged aluminum door(s) and painted with a hammer tone powder coat paint finish to match cabinet color choice.
- There shall be one (1) vertically adjustable shelf in each of the above cabinets. It shall have a 1.25" lip to contain items while minimizing space used.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **K-1480 : MIDDLE ATLANTIC 40U DATA RACK**

There shall be an EIA compliant 19" gangable equipment rack, Middle Atlantic Products model # MRK-4031.

Overall dimensions shall be 76.125"H x 22.0"W x 26.4"D. Useable height shall be 40 rack spaces, useable depth shall be 24". Fully welded construction shall provide a static capacity of 10,000 lbs. and a UL Listed load capacity of 2,500 lbs.

Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel, rear door shall be 18-gauge steel and all structural elements shall be finished in a durable black powder coat.

Rack shall come equipped with two pairs of 11-gauge steel rack rail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rack spaces.

Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae.

Solid front door with black textured powder coat finish and keylock. The door is capable of hinging on either the left or the right of the rack.

Integrated fan top includes 4.5" fans, fan guards and proportional speed thermostatic fan controller.

The PD-920R-NS rackmount power distribution unit is equipped with 8 circuit breaker protected rear outlets (NEMA 5-20R), and one front outlet (NEMA 5-15R). An illuminated combination power switch/circuit breaker is located on the front panel. UL listed in the US and Canada. Occupies one rackspace.

The APC Uninterruptible Power Supply (UPS) provides protection for electronic equipment from utility power blackouts, brownouts, sags and surges. The UPS filters small utility line fluctuations and isolates electronic equipment from large disturbances by internally disconnecting from utility line power. The UPS provides continuous power from the batteries until utility power returns to safe levels or the batteries are fully discharged.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **K-1490 : CURBSIDE INTERIOR AREA (IC5)**

#### **K-1500 : FLAT FLOOR SLIDE-OUT EXTENSION**

There shall be one (1) "slide-out" section(s) which shall extend approximately 32" as measured from the outside of the body. The extendable module shall be approximately 118" in length and 75" high. The interior height shall be approximately 9" less than the interior height of the body walkway. The installed module shall provide a water tight seal in both the fully extended and the retracted positions.

The slide-out section shall utilize smooth operating hydraulic system. The slide-out will be flat floor design.

The slide-out section shall be framed with 2" x 2" x 1/4" 6061-T6 alloy aluminum. The frame structure shall be covered with no less than 1/8" thick 3003-H14 smooth aluminum.

Full width padded foam cushion head bumpers shall be provided in the slideout. Head bumpers shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one at each end of the slide-out section. The lights shall activate and be visible when the unit is extended.

All electrical wiring installed in the slide-out wall shall run through a boxed type conduit at the lower corner of the system. All wiring shall be enclosed in a flexible, moisture resistant, reinforced conduit, with proper seal tight connectors and hardware. Access shall be provided for inspection of all wiring and the gear and rack mechanism.

The Command Center "Slide-out" must be able to withstand years of rugged service and wear. For this reason, this design, metal thickness and attachments must be strictly adhered to. RV type slide-outs or slide-outs using light weight metal or fiberglass shall not be acceptable.

NOTE: The slide outs shall be controlled as follows: (1) umbilical on the rear of the truck to allow function of all (4) slide outs to move out only, locate switches on the inside to bring the slide outs in only.

#### **K-1510 : SLIDE-OUT SIDE WINDOWS**

There shall be two (2) 18" wide x 22" high non-sliding window(s) installed one (1) on each side of the specified slide-out wall. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

#### **K-1520 : INTERIOR SLIDE-OUT WINDOW COVERS**

An interior window cover shall be provided on the two (2) windows in the slide-out wall.

The window covers shall be of Cover Lite Select, 22 oz material. Snap type fasteners shall be installed around each window in the body to allow each window to be covered.

#### **K-1530 : FLIP-UP SEAT**

There shall be a flip-up seat sized for two (2) person/people. The seat bottom cushion shall be mounted to a spring loaded bracket system which shall return the cushion to vertical when not in use. The cushion shall be approximately 3" thick with a wood platform for stability. The cushion shall be covered with Duraware heavy duty fabric material. This seat shall not include seat belts and therefore will not be considered a riding position.

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#### **K-1540 : INTERIOR SEATS**

Four (4) Herman Miller, highly adjustable Aeron Roll-Around Chairs furnished and installed in the body command area slide out.

Each chair shall have a Kinemat tilt mechanism that allows the body to pivot naturally and simultaneously at the ankles, knees, and hips providing a smooth ride and proper support from forward-leaning to reclining postures.

There shall be lumbar adjustment vertically through 4 1/2-inch height range. Its depth can be set at 3/4 inch or 1 1/4 inches.

There shall be a suspension system fabricated from unique Pellicle material; the Aeron chair distributes weight evenly over the seat and back, conforming to each person's shape. The material also lets air pass through, adding to long-term comfort by preventing body-heat build-up.

The armrests shall be independently adjustable with settings that pivot inward 17.5 degrees for keying and outward 15 degrees. Arm height adjusts independently within a four-inch vertical range.

Monitors

#### **K-1550 : 27" LCD HD MONITOR(S)**

Four (4) commercial grade, 27" multiple input, High Definition flat panel LCD monitor(s) shall be provided and installed on completed unit.

Monitor shall be complete and fully operational, including all miscellaneous coax cable, 120 volt AC wiring, and cable connections.

All to be connected to the video routing system connected with high definition cables, wall mounts included with each monitor. Set up as per the pre con sales drawing

#### **K-1560 : SMART BOARD**

A specified Smart Board will be mounted the curbside interior wall of rear curbside slide-out.

#### **K-1570 : 120 VOLT SLIDE-OUT OUTLETS**

There shall be three (3) 120 volt outlet(s) located in the slide-out area of the body.

#### **K-1580 : OUTLET STRIP**

There shall be one (1) 120 volt outlet strip(s) approximately 2' long with straight blade household type outlets provided on the interior of apparatus body. 15 ampere circuit breaker protection shall be provided for each strip. Exact location shall be specified by the HOUSTON FIRE DEPARTMENT at the pre-construction meeting.

- There shall be three (3) 120 volt, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided on the curbside wall. **Note:** One (1) of these outlets will be wired into the inverter. A red cover will be used to indicate that this outlet is wired into inverter.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **K-1590 : CONFERENCE TABLE POP-UP TECHNICAL PORTS**

The rear conference table will have a pop-up style technical port, one (1) phone outlet and 120 volt electrical outlet system mounted in the center of table.

## **K-1600 : CONFERENCE TABLE**

A conference table will be provided in the Rear Conference Area of the body. The table will be fabricated with a 1/8" Aluminum with grey hammertone powder coated finish top matching the specified workstation desktops. The dimensions of this desk will be approximately 36"wide X62' long.

## **K-1610 : REAR INTERIOR WALL AREA**

### **K-1620 : 120 VOLT REAR WALL INTERIOR OUTLETS**

There shall be two (2) 120 volt outlet(s) located on the rear wall of the walk-in area of the body.

- The receptacle shall be 20 amp, straight-blade ( NEMA 5-20R ).

### **K-1630 : MAGNETIC WHITEBOARDS**

There shall be one (1) magnetic whiteboard surface mounted on the rear wall of the walk-in interior. Location and size to be determined per sales drawing

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

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## Section L

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### L-1000 : LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

#### General

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body shall be run in full length electrical wiring raceway down each side of body.

#### Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 % of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 %. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, *Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring*.

#### Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable*, or SAE J1128, *Low Voltage Primary Cable*, type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures. The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.



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Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

Circuits shall be provided with properly rated low voltage overcurrent protective devices. Such devices shall be readily accessible and protected against heat in excess of the overcurrent device's design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

- (1) SAE J156, *Fusible Links*
- (2) SAE J553, *Circuit Breakers*
- (3) SAE J554, *Electric Fuses (Cartridge Type)*
- (4) SAE J1888, *High Current Time Lag Electric Fuses*
- (5) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125 % of maximum current for which the circuit is protected.

#### Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

#### Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

- (1) The propulsion engine and transmission
- (2) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- (3) The radio(s) at a duty cycle of 10 percent transmit and 90 % receive (for calculation and testing purposes, a default value of 5 A continuous)
- (4) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
- (5) The minimum optical warning system, where the apparatus is blocking the right-of way
- (6) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- (7) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

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If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

#### Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

#### Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

#### Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

#### **L-1010 : 12 VOLT MULTIPLEX CONTROL CENTER**

The apparatus shall have a multiplexed 12 volt electrical system that will provide complete diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators.

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#### **L-1020 : BATTERY SYSTEM**

The battery connectors shall be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables shall provide maximum power to the electrical system. Where required, the cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

Batteries shall be of the high-cycle type. With the engine off, the battery system shall be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity and then to restart the engine. The battery system cold cranking amps (CCA) rating shall meet or exceed the minimum CCA recommendations of the engine manufacturer. The batteries shall be mounted to prevent movement during fire apparatus operation and shall be protected against accumulations of road spray, snow, and road debris. The batteries shall be readily accessible for examination, testing, and maintenance.

A means shall be provided for jump-starting the engine if the batteries are not accessible without lifting the cab of a tilt-cab apparatus.

Where an enclosed battery compartment is provided, it shall be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries shall be protected against vibration and temperatures that exceed the battery manufacturer's recommendation.

A master load disconnect switch shall be provided between the starter solenoid(s) and the remainder of the electrical loads on the apparatus. The starter solenoids shall be connected directly to the batteries.

Electronic control systems and similar devices shall be permitted to be otherwise connected if so specified by their manufacturer.

The alternator shall be wired directly to the batteries through the ammeter shunt(s), if one is provided, and not through the master load disconnect switch.

A green "battery on" pilot light that is visible from the driver's position shall be provided.

A sequential switching device shall be permitted to energize the optical warning devices and other high current devices required in minimum continuous electrical load, provided the switching device shall first energize the electrical devices required in minimum continuous electrical load within five (5) seconds.

#### **L-1030 : BATTERY SWITCH**

One (1) battery "On/Off" switch in cab located within easy reach of Driver with green "BATTERY ON" pilot light that is visible from the driver's position shall be provided. The switch and pilot light shall be supplied and installed by the cab/chassis manufacturer.

#### **L-1040 : BATTERY SOLENOID**

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

# HOUSTON FIRE DEPARTMENT

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### BID SPECIFICATION

#### **L-1050 : BATTERY CONDITIONER**

One (1) Xantrex model XC5012 battery conditioner, with 120 VAC input, and 50 amp 12 VDC output shall be provided. This system shall have a multiplex charging mode which employs the 3-stage charging algorithm: Bulk, Absorption, and Float. During the Bulk stage the battery is accepting high current. In the Absorption stage the battery voltage is held constant and the current declines. Finally, in the Float stage, the charger continues to provide voltage at a lower level to maintain the battery in a fully charged state. If there is no load on the battery, it will typically draw very little current. The charger, however, is able to provide current to its full rating to power DC loads on the battery. In float, if batteries are very new or a battery is on the low end of the size range and if it is fully charged to the point where it will not accept any more current, then the charger will enter an adaptive float/no float behavior where it shall alternate between float charging (flo) and resting the battery (rdy).

A remote bar graph type indicator panel shall be provided for showing status of battery charger.

The charger shall have a EMC FCC Class B Approval, **NO EXCEPTIONS**.

#### **L-1060 : BATTERY CHARGE INDICATOR**

A Kussmaul 091-94-12E charge indicator display shall be provided and located near driver's door area. This single battery system indicator is a suppressed zero bar graph voltage display which may be installed in any 12 volt system.

#### **L-1070 : SHORE POWER INLET**

The shore power inlet for battery conditioner shall be supplied and installed by the cab chassis manufacturer.

#### **L-1080 : FRC "TAC PLUS" WITH FUEL LEVEL OPTION**

One (1) FRC "Tac Plus" engine diagnostic panel shall be provided and located in the rear body to monitor fuel, water temperature, oil pressure, etc. The panel shall be located in the body entry door area.

#### **L-1090 : ENGINE COMPARTMENT LIGHT**

Engine compartment light(s) shall be supplied and installed by the cab chassis manufacturer.

#### **L-1100 : CAB HAZARD WARNING LIGHT**

A red "HAZARD" warning light shall be supplied and installed by the cab/chassis manufacturer. Light shall illuminate automatically to warn the Driver of the following when the apparatus parking brake is not fully engaged:

- Any passenger or compartment door is open
- Equipment rack is not in stowed position
- Light tower is extended

The light shall be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

#### **L-1110 : BACK-UP ALARM**

An electronic back-up alarm shall be supplied and installed by the cab/chassis manufacturer. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse.

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#### **L-1120 : REAR VIEW CAMERA**

The cab chassis provided rear view camera shall be installed on the rear of the body.

#### **L-1130 : TAIL LIGHTS**

Rear body tail lights shall be vertically mounted per Federal Motor Vehicle Safety Standards. The following lights shall be furnished:

- Two (2) Whelen 900 Series 90A00TAR amber LED turn signal lights.
- Two (2) Whelen 900 Series 90R00XRR red LED stop/tail lights.
- Two (2) Whelen 900 Series 90C0ENZR clear LED back-up lights with clear lens.

Each of the lights above shall be mounted in a 9EFLANGE, chrome finish bezel.

#### **L-1140 : MIDSHIP MARKER/TURN SIGNAL**

Two (2) Whelen LED midship body clearance marker/turn signal lights (T0A00MAR) shall be installed. There shall be one (1) light on each side of the body, in the wheel well, ahead of the rear axle. Both lights shall have an amber lens and operate with the chassis clearance marker and turn signals.

#### **L-1150 : MARKER LIGHTS**

The apparatus body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) regulations. All body clearance lights shall be LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.

#### **L-1160 : REAR BUMPER MARKER LIGHTS**

Two (2) Britax L427 dual face flexible mounted rear bumper markers shall be located, one (1) each side lower rear corner of body visible from driver mirrors.

#### **L-1170 : RETRACTABLE STEP GROUND LIGHT**

There shall be one (1) OnScene Solutions 9" LED Nightstik light(s) installed on the apparatus capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting designed to provide illumination under the body's side entrance door and shall be switchable but activated automatically when the exit doors are opened.

#### **L-1180 : LICENSE PLATE MOUNTING BRACKET**

There shall be one (1) Cast Products aluminum license plate mounting with chrome shielded license plate light mounted on the rear of the body.

#### **L-1190 : ELECTRONIC SIREN**

The siren control head shall be supplied and installed by the cab/chassis manufacturer.

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#### **L-1200 : SIREN SPEAKER**

The siren speaker(s) shall be supplied and installed by the cab/chassis manufacturer.

#### **L-1210 : SIDE SCENE LIGHTS**

There shall be six (6) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (90C0ENZR) provided on the upper body. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3000 Lumens. The light shall be a 8-32 degree gradient lens and chrome flange. They will be equally divided between the curbside and streetside.

Two (2) switches shall be provided, one (1) for the streetside scene lights, and one (1) for the curbside scene lights.

The lights shall be switched at the Vista display in the cab.

#### **L-1220 : REAR SCENE LIGHTS**

There shall be one (1) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (90C0ENZR) shall be provided on the upper rear body to light the work area immediately behind the vehicle to a level of at least 3 fc (30 lx) within a 10 ft x 10 ft (3 m x 3 m) square. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3000 Lumens. The light shall be a 8-32 degree gradient lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

The rear scene lights shall also be activated when the apparatus is in reverse.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section M

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### **M-1000 : WARNING LIGHT PACKAGE**

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two signaling modes.

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

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### BID SPECIFICATION

#### M-1010 : UPPER LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

#### ZONE A - FRONT WARNING LIGHTS

There shall be one (1) Whelen Delta DIHFD70 LED 73" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

QUANTITY	PART NUMBER	DESCRIPTION
1	DI2S700	73" Delta Light Bar
2	DDUMFRR	Two (2) 400 Red Linear
1	DDUMFCC	Two (2) 400 White Linear
2	02-0364782-55	Delta Red LED Corner Module Assembly
1	DD7CCCCC	Delta Dome Set
8	01-0264077250	500 Red Linear LED
6	01-0264077230	500 White Linear LED
16	02-0364086-00	Lower Level Lighthouse Retainer Assembly
2	09-1363542-00	500 Series Filler Panel
3	01-026A167-00	Four (4) Channel Flasher (ULF44)
1	MKE8H	Permanent Mount Kit
1	OPTIDELT	Opticom Pre-Wire
1	792H	Opticom Emitter

Note: The Opticom will be furnished with a "HIGH PRIORITY FREQUENCY" at 001 code.

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

The lightbar shall be separately switched at the vista display in the cab.

#### ZONES B AND D - SIDE WARNING LIGHTS

#### UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90CC5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90CC5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

#### UPPER CENTER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90CC5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

#### ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") amber Linear Super-LED lights (90AA5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

#### M-1020 : LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1220 mm) above level ground for small apparatus.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

#### ZONE A - FRONT WARNING LIGHTS

The warning lights shall be supplied and installed by the cab/chassis manufacturer. They shall be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights shall be switched at the Vista display in the cab.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

The warning lights shall be supplied and installed by the cab/chassis manufacturer. They shall be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights shall be switched at the Vista display in the cab.

#### ZONES B AND D - BODY INTERSECTOR LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

#### ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

#### ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

There shall be two (2) Whelen 900 series (9" x 7") amber Linear Super-LED lights (90AA5FAR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section N

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### **N-1000 : LINE VOLTAGE ELECTRICAL SYSTEM**

#### **N-1010 : ONAN PTO GENERATOR**

The apparatus shall be equipped with an Onan Protec PTO generator system with a capacity of 35,000 watts at 120/240 VAC, 291/145 amps., single phase. Current frequency shall be stable at 60 hertz.

The transmission's PTO port and PTO, or the split shaft PTO, and all associated drive shaft components shall be rated to support the continuous duty torque requirements of the generator's continuous duty rating as stated on the power source nameplate.

The direct drive generator shall be mounted so that it does not change the ramp breakover angle, angle of departure, or angle of approach as defined by other components, and it shall not extend into the ground clearance area.

The direct drive generator shall be mounted away from exhaust and muffler areas or provided with a heat shield to reduce operating temperatures in the generator area.

#### **N-1020 : GENERATOR ENGAGEMENT**

A "Generator Engaged" indicator shall be provided in the driving compartment to indicate that the generator shift has been successfully completed.

An "OK to Operate Generator" indicator shall be provided in the driving compartment to indicate that the generator is engaged (if not always engaged), the transmission is in the proper gear (if required, automatic transmissions only), and the parking brake is engaged (if applicable).

An interlock system shall be provided to prevent advancement of the engine speed in the driving compartment or at any operator's panel unless the parking brake is engaged, and the transmission is in neutral or the output of the transmission is correctly connected to a pump or generator instead of the drive wheels.

#### **N-1030 : WARRANTY PERIOD**

Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Protec YDCR series PTO generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery to the first purchaser.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **N-1040 : GENERATOR SPLASH GUARD**

A powder coat painted splash cover shall be installed to reduce the amount of road spray on the frame mounted PTO generator. A V-ring seal shall also be installed in the cover to provide additional protection against contaminants reaching the generator front seals.

#### **N-1050 : GENERATOR MOUNTING**

The generator shall be mounted between the chassis frame rails. The generator mounting brackets shall be fabricated using heavy duty steel tubing, or structural channel. The generator mounting shall be bolted and removable so that the generator can be lowered from under apparatus for service, if necessary. The generator case shall not extend below the bottom edge of the apparatus body.

#### **N-1060 : MANUALS AND SCHEMATICS**

Two (2) complete manuals on parts list, maintenance, wiring schematics, hydraulic schematics, circuit boards, voltage regulator board and other components shall be provided on delivery.

#### **N-1070 : GENERATOR COMPARTMENT INSULATION**

The generator compartment shall be provided with heavy duty sound insulation applied to walls and ceiling. Insulation shall have a high temperatures rating with a foil facing and attached to walls with a positive type fasteners, glue type adhesive shall not be acceptable.

#### **N-1080 : POWER-TAKE-OFF GENERATOR DRIVE**

There shall be a "Hot Shift" power-take-off (PTO) installed on the transmission PTO by the cab chassis manufacturer. The "Hot Shift" PTO is provided to allow the engagement of the PTO at higher engine RPM speeds. The PTO output shall be connected to the generator through hollow tube type driveline with heavy duty universals.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO.

The power supply to the PTO engagement control shall be wired to the parking brake and a neutral position transmission switch to prevent engagement unless the vehicle is stopped and transmission has been placed in neutral.

#### **N-1090 : ENGINE SPEED CONTROL**

An engine speed auxiliary control device (high idle switch or throttle) shall be installed to maintain a stable cycle output from generator when the apparatus is parked.

An interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels.

The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent apparatus functions such as generator, water pump, or aerial operation.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **N-1100 : GENERATOR MONITORING PANEL**

To properly monitor the generator performance and load demand during operation, the generator installation shall be equipped with a full instrument monitor panel.

This unit shall be manufactured by FRC model FROG-D and mounted next to the circuit breaker panel. This generator output display shall consolidate five (5) generator monitoring instruments into one device. The display case shall be waterproof and have dimensions not to exceed 4 1/4" high by 4 1/4" wide by 3 1/4" deep.

The following continuous displays shall be provided with super bright LED digits more than 1/2" high:

- Generator frequency in hertz
- Line 1 current in amperes
- Line 2 current in amperes
- Generator voltage in volts

The program shall support the accumulation of elapsed generator hours and the monitoring of engine oil temperature. Generator hours and oil temperature shall be displayed at the push of a button.

#### **N-1110 : LOADCENTER**

The loadcenter shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/240 volt AC, such as lighting and small motor branch circuits. The loadcenter enclosure shall be made of 16 gauge galvanized sheet steel. The galvanized coating provides corrosion protection and as such does not require paint. All trims used on the BR Loadcenter shall be chromate sealed and finished with electro disposition epoxy paint (ASA61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door shall be supplied.

The loadcenter shall be UL / CSA listed, **NO EXCEPTIONS** will be allowed.

#### **N-1120 : SHORE POWER INLET - BATTERY CHARGER**

The above mentioned shore power inlet, and battery conditioner shall be specified in the 12 volt section.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **N-1130 : SHORE POWER INLET - INVERTER**

One (1) Kussmaul 30 amp "Super Auto-Eject" shore power inlet shall be furnished and installed. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged. The shore power inlet shall provide an external power source for apparatus electrical circuits. A matching 30 ampere plug shall be shipped with the apparatus for HOUSTON FIRE DEPARTMENT supplied external power source wiring.

A transfer switch shall be required to isolate one power source from the other where a circuit(s) is intended to be supplied from more than one power source. To protect both the generator and external power source from back feed, two (2) 120 volt, 30 ampere, 4PST auxiliary contact with safety interlock relay shall be installed. Relay shall cut-off the connection between the generator supply circuit and device circuits when shore power is connected.

Transfer equipment, including transfer switches, shall operate such that all ungrounded conductors of one power source are disconnected before any ungrounded conductors of the second power source are connected. The neutral conductor shall be switched through the transfer switch. The apparatus shall have a label permanently affixed at the power inlet that indicates the line voltage, and amperage.

- The outlet cover shall be red.
- The shore power plug shall be located near the Driver door area.
- Shore power shall be wired to the specified 120 volt inverter.

#### **N-1140 : SHORE POWER INLET - 100 AMP**

A 100 ampere, 240 VAC, single phase shore power inlet shall be provided on the apparatus to provide an external power source for apparatus electrical circuits. A matching 100 ampere plug shall be shipped with the apparatus for HOUSTON FIRE DEPARTMENT supplied external power source wiring.

Shore power shall be wired to apparatus main circuit breaker in the circuit breaker distribution panel and feed all 120/240 electrical circuits on apparatus.

To protect both the generator and external power source from back feed, a manual switch shall be installed at the generator control panel, to cut off the connection between the apparatus circuits and the generator when the external power source plug is in use.

#### **N-1150 : 50' 100 AMP SHORE POWER CORD**

There shall be (1) 50' 100 amp. shore power extension cord supplied with the apparatus with one (1) Appleton 100 amp. plug one (1) end and no plug end on the opposite end.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **N-1160 : OUTLETS AND CIRCUITS**

The generator shall supply the electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

- Four (4) 120 volt exterior outlets, two (2) each side near rear wheel well area.
  - Two (2) receptacles shall be 20 amp, straight-blade ( NEMA 5-20R ). **Note:** Outlets to be in cast aluminum housing and outlet cover.
  - Two (2) receptacles shall be 20 amp, Fire Power type. **Note:** Outlets to be in cast aluminum housing and outlet cover.
- Two (2) 120 volt exterior outlets, one (1) each side rear of body.
  - The receptacles shall be 20 amp, Fire Power type. **Note:** Outlets to be in cast aluminum housing and outlet cover.

#### **N-1170 : INTERIOR BODY 12/120 VOLT LIGHTING**

There shall be seventeen (17) 12/120 volt light(s) installed in the walk-in area of the body. The fixtures shall be On Scene Solution LED lighting in a cast fixture. Each light shall be capable of operating under both 12 volt and 120 volt with a default to 12 volt power until 120 volt power is supplied to the vehicle. Each light housing shall produce both white and red LED lighting with the option to use either color, there shall also be different brightness settings for the lights that will be located on a separate switch.

The operation of the lights shall be at the entry doorway area. The interior lights shall be wired to both the 12 volt system and the 120/240 volt generator system with a 15 amp circuit breaker protection.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **N-1180 : INVERTER**

The apparatus shall be equipped with a Xantrex model Prosine 3.0 inverter that provides 3,000 watt inverter, 50 A surge capability, 120 VAC, 60 cycle output from 12 VDC.

The alternator and/or battery system shall be adequate to provide power for continuous operation for a minimum of 2 hours at full output.

#### **Prosine 3.0**

- Power factor corrected multistage charger
- True sine wave output (crystal controlled)
- Built-in 30 A transfer switch automatically transfers between inverter power and incoming AC power
- Equalization mode conditions batteries for longer life
- Power sharing prevents tripping of shorepower breaker
- Compact, lightweight, and easy to install
- Includes remote panel and battery temperature sensor
- Two year warranty

#### **Protection Features**

- Over voltage and under voltage protection
- Over temperature protection and automatic overload protection
- Short circuit AC backfeed protection

#### **Prosine 3.0 (ACS) Remote Panel (Included)**

- Independent inverter and charger on/off controls
- Push button control of power sharing, equalizing, battery set-up
- Easy to read backlit digital display
- Single at-a-glance display of AC and DC system information
- Text message fault diagnostics

#### **N-1190 : INVERTER BATTERY SUPPLY**

There shall be six (6) deep cycle batteries provided as the 12 volt power source for the onboard inverter. The batteries shall incorporate Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance. The batteries shall be mounted in a stainless steel pan with hold down provisions for mobile application. **Note:** These batteries will be the deep cycle type.

#### **N-1200 : INVERTER BATTERY SUPPLY - VSR**

There shall be one (1) Voltage Sensitive Relay (VSR) provided with the deep cycle batteries. The VSR allows two (2) batteries to be charged at the same time. When the engine is started and the start battery reaches 13.7 volts, the VSR engages, allowing two (2) battery banks (start and inverter supply) to be charged simultaneously. When the voltage drops below 12.8 volts (e.g. the engine is stopped), the VSR disengages, separating the batteries. This system eliminates the possibility of draining the wrong battery and protects sensitive electronic equipment powered from the house battery from harmful engine start up spikes.

#### **N-1210 : CIRCUIT BREAKER BOX**

The circuit breaker box shall be a Cutler Hammer or equal with cover, and circuit breakers rated to the wire size and load demand. Main breaker shall be provided on generator.



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### N-1220 : GENERAL REQUIREMENTS

##### Stability

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz,  $\pm 3$  Hz when producing power at all levels between no load and full rated power. Any fixed line voltage power source shall produce electric power at the rated voltage  $\pm 10$  percent when producing power at all levels between no load and full rated power.

The maximum voltage supplied to portable equipment shall not exceed 275 volts to ground. Higher voltage shall be permitted only when used to operate fixed wired, permanently mounted equipment on the apparatus.

##### Conformance with National Electrical Code

All components, equipment, and installation procedures shall conform to *NFPA 70, National Electrical Code*, except where superseded by the requirements of this chapter. Where the requirements of this chapter differ from those in *NFPA 70*, the requirements in this chapter shall apply.

Where available, line voltage electrical system equipment and materials included on the apparatus shall be listed and used only in the manner for which they have been listed. All equipment and materials shall be installed in accordance with the manufacturer's instructions.

##### Location Ratings

Any equipment used in a dry location shall be listed for dry locations. Any equipment used in a wet location shall be listed for wet locations.

Any equipment, except a PTO-driven generator, used in an underbody or under chassis location that is subject to road spray shall be either listed as Type 4 or mounted in an enclosure that is listed as Type 4.

If a PTO-driven generator is located in an underbody or under chassis location, the installation shall include a shield to prevent road spray from splashing directly on the generator.

##### Grounding

Grounding shall be in accordance with 250.34(A) and 250.34(B) of *NFPA 70*. Ungrounded systems shall not be used.

Only stranded or braided copper conductors shall be used for grounding and bonding.

The grounded current-carrying conductor (neutral) shall be insulated from the equipment-grounding conductors and from the equipment enclosures and other grounded parts.

The neutral conductor shall be colored white or gray in accordance with 200.6, "Means of Identifying Grounded Conductors," of *NFPA 70*.

Any bonding screws, straps, or buses in the distribution panelboard or in other system components between the neutral and equipment-grounding conductor shall be removed and discarded.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Bonding

The neutral conductor of the power source shall be bonded to the vehicle frame. The neutral bonding connection shall occur only at the power source. In addition to the bonding required for the low voltage return current, each body and each driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor.

The conductor shall have a minimum amperage rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated amperage on the power source specification label.

A single conductor that is sized to meet the low voltage and line voltage requirements shall be permitted to be used.

#### Ground Fault Circuit Interrupters

In special service vehicles incorporating a lavatory, sink, toilet, shower, or tub, 120 V, 15 or 20 A receptacles within 6 ft (1.8 m) of these fixtures shall have ground fault circuit interrupter (GFCI) protection. GFCIs integrated into outlets or circuit breakers or as stand-alone devices shall be permitted to be used in situations.

#### Power Source General Requirements

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

The power source shall be shielded from contamination that would prevent the power source from operating within its design specifications.

#### Power Source Rating

For power sources of 8 kW or larger, the power source manufacturer shall declare the continuous duty rating that the power source can provide when installed on fire apparatus according to the manufacturer's instructions and run at 120°F (49°C) air intake temperature at 2000 ft (600 m) above sea level.

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing. The power source shall be located such that neither it nor its mounting brackets interfere with the routine maintenance of the fire apparatus.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Instrumentation

If the power source is rated at less than 3 kW, a "Power On" indicator shall be provided. If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

If the power source is rated at 8 kW or more, the following instrumentation shall be provided at an operator's panel:

- (1) Voltmeter
- (2) Current meters for each ungrounded leg
- (3) Frequency (Hz) meter
- (4) Power source hour meter

The instrumentation shall be permanently mounted at an operator's panel. The instruments shall be located in a plane facing the operator. Gauges, switches, or other instruments on this panel shall each have a label to indicate their function.

The instruments and other line voltage equipment and controls shall be protected from mechanical damage and not obstructed by tool mounting or equipment storage.

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

#### Operation

Provisions shall be made for placing the generator drive system in operation using controls and switches that are identified and within convenient reach of the operator.

Where the generator is driven by the chassis engine and engine compression brakes or engine exhaust brakes are furnished, they shall be automatically disengaged for generator operations.

Any control device used in the generator system power train between the engine and the generator shall be equipped with a means to prevent unintentional movement of the control device from its set position in the power generation mode.

If there is permanent wiring on the apparatus that is designed to be connected to the power source, a power source specification label that is permanently attached to the apparatus at the operator's control station shall provide the operator with the information required.

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment, crew compartment, or onboard command area with windows and doors closed or at any operator's station on the apparatus.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Power Supply Assembly

The conductors used in the power supply assembly between the output terminals of the power source and the main overcurrent protection device shall not exceed 12 ft (4 m) in length.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent ampere rating and shall be sized to carry not less than 115 percent of the ampere of the nameplate current rating of the power source.

If the power supply assembly connects to the vibrating part of a generator (not a connection on the base), the conductors shall be flexible cord or other fine-stranded conductors enclosed in metallic or nonmetallic liquid tight flexible conduit rated for wet locations and temperatures not less than 194°F (90°C).

#### Overcurrent Protection

Manually resettable overcurrent devices shall be installed to protect the line voltage electrical system components.

#### Power Source Protection

A main overcurrent protection device shall be provided that is either incorporated in the power source or connected to the power source by a power supply assembly.

The size of the main overcurrent protection device shall not exceed 100 percent of the rated ampere stated on the power source specification label or the rating of the next larger available size overcurrent protection device, where so recommended by the power source manufacturer.

If the main overcurrent protection device is subject to road spray, the unit shall be housed in a Type 4-rated enclosure.

#### Branch Circuit Overcurrent Protection

Overcurrent protection devices shall be provided for each individual circuit and shall be sized at not less than 15 amps in accordance with 240.4, "Protection of Conductors," of *NFPA 70*.

Any panelboard shall have a main breaker where the panel has six or more individual branch circuits or the power source is rated 8 kW or larger.

Each overcurrent protection device shall be marked with a label to identify the function of the circuit it protects.

Dedicated circuits shall be provided for any large appliance or device (air conditioning units, large motors, etc.) that requires 60 percent or more of the rated capacity of the circuit to which it is connected, and that circuit shall serve no other purpose.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Panelboards

All fixed power sources shall be hardwired to a permanently mounted panelboard unless one of the following conditions exists:

- (1) All line voltage power connections are made through receptacles on the power source and the receptacles are protected by integrated overcurrent devices.
- (2) Only one circuit is hardwired to the power source, which is protected by an integrated overcurrent device.

The panel shall be visible and located so that there is unimpeded access to the panelboard controls. All panelboards shall be designed for use in their intended location. The panel(s) shall be protected from mechanical damage, tool mounting, and equipment storage.

Where the power source is 120/240 V and 120 V loads are connected, the apparatus manufacturer or line voltage system installer shall consider load balancing to the extent that it is possible.

#### Wiring Methods

Fixed wiring systems shall be limited to the following:

- (1) Metallic or nonmetallic liquid tight flexible conduit rated at temperatures not less than 194°F (90°C) with stranded copper wire rated for wet locations and temperatures not less than 194°F (90°C)
- (2) Type SOW, SOOW, SEOW, or SEOOW flexible cord rated at 600 V and at temperatures not less than 194°F (90°C)

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring and shall be arranged as follows:

- (1) Separated by a minimum distance of 12 in. (300 mm) from exhaust piping or shielded from such piping
- (2) Separated from fuel lines by a minimum distance of 6 in. (150 mm)

A means shall be provided to allow "flexing" between the driving and crew compartment, the body, and other areas or equipment whose movement would stress the wiring.

Electrical cord or conduit shall be supported within 6 in. (150 mm) of any junction box and at a minimum of every 24 in. (600 mm) of run.

Supports shall be made of nonmetallic materials or of corrosion-resistant or corrosion-protected metal. All supports shall be of a design that does not cut or abrade the conduit or cord and shall be mechanically fastened to the apparatus.

Only fittings and components listed for the type of cord or conduit being installed shall be used.

Splices shall be made only in a listed junction box.

#### Additional Requirements for Flexible Cord Installations

Where flexible cord is used in any location where it could be damaged, it shall be protected by installation in conduit, enclosures, or guards.

Where flexible cord penetrates a metal surface, rubber or plastic grommets or bushings shall be installed.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Wiring Identification

Each line voltage circuit originating from the main panelboard shall be identified.

The wire or circuit identification either shall reference a wiring diagram or wire list or shall indicate the final termination point of the circuit.

Where prewiring for future power sources or devices exists, the un-terminated ends shall be marked with a label showing their wire size and intended function.

#### Wiring System Components

Only stranded copper conductors with an insulation rated for temperatures of at least 194°F (90°C) and wet locations shall be used. Conductors in flexible cord shall be sized in accordance with Table 400.5(A) of *NFPA 70*. Conductors used in conduit shall be sized in accordance with 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*. Aluminum or copper-clad aluminum conductors shall not be used.

All boxes shall conform to and be mounted in accordance with Article 314, "Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Manholes," of *NFPA 70*. All boxes shall be accessible using ordinary hand tools. Boxes shall not be permitted behind welded or pop-riveted panels.

The maximum number of conductors permitted in any box shall be in accordance with 314.16, "Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies," of *NFPA 70*.

All wiring connections and terminations shall provide a positive mechanical and electrical connection. Connectors shall be installed in accordance with the manufacturer's instructions. Wire nuts or insulation displacement and insulation piercing connectors shall not be used.

Each switch shall indicate the position of its contact points (i.e., open or closed) and shall be rated for the continuous operation of the load being controlled. All switches shall be marked with a label indicating the function of the switch. Circuit breakers used as switches shall be "switch rated" (SWD) or better. Switches shall simultaneously open all associated line voltage conductors. Switching of the neutral conductor alone shall not be permitted.

Line voltage circuits controlled by low voltage circuits shall be wired through properly rated relays in listed enclosures that control all non-grounded current-carrying conductors.

#### Receptacles and Inlet Devices

##### Wet and Dry Locations

All wet location receptacle outlets and inlet devices, including those on hardwired, remote power distribution boxes, shall be of the grounding type, provided with a wet location cover, and installed in accordance with Section 406.8, "Receptacles in Damp or Wet Locations," of *NFPA 70*.

All receptacles located in a wet location shall be not less than 24 in. (600 mm) from the ground. Receptacles on off road fire apparatus shall be a minimum of 30 in. (750 mm) from the ground. All receptacles located in a dry location shall be of the grounding type and shall be at least 12 in. (300 mm) above the interior floor height. No receptacle shall be installed in a face-up position.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### Receptacle Label

Each receptacle shall be marked with a label indicating the nominal line voltage (120 volts or 240 volts) and the current rating in amps of the circuit. If the receptacle is DC or other than single phase, that information shall also be marked on the label.

All receptacles and electrical inlet devices shall be listed to UL 498, *Standard for Safety Attachment Plugs and Receptacles*, or other recognized performance standards.

Receptacles used for DC voltages shall be rated for DC service.

#### Receptacle Label

Each receptacle shall be marked with a label indicating the nominal line voltage (120 volts or 240 volts) and the current rating in amps of the circuit. If the receptacle is DC or other than single phase, that information shall also be marked on the label.

All receptacles and electrical inlet devices shall be listed to UL 498, *Standard for Safety Attachment Plugs and Receptacles*, or other recognized performance standards.

Receptacles used for DC voltages shall be rated for DC service.

#### Wiring Schematics

An "As-Built" Wiring diagrams for line voltage systems shall be provided to include the following information;

- (a) Pictorial representations of circuit logic for all electrical components and wiring
- (b) Circuit identification
- (c) Connector pin identification
- (d) Zone location of electrical components
- (e) Safety interlocks
- (f) Alternator–battery power distribution circuits
- (g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## SECTION O

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### **O-1000 : TECH SYSTEMS**

#### **O-1010 : RADIO INTEROPERABILITY**

One (1) Complete Telex radio interoperability system shall be provided and installed by the Body Manufacturer. The system shall allow for patching and cross patching of eight (8) radios and two (2) POTS lines. There will be a dispatch location at each workstation for a total of seven (7) dispatch positions.

Dispatch Locations:

- Curbside forward slide out foremost workstation
- Curbside forward slide out foremost middle workstation
- Curbside forward slide out rearmost middle workstation
- Curbside forward slide out rearmost workstation.
- Street side forward slide out foremost workstation
- Street side forward slide out middle workstation
- Street side forward slide out rearmost workstation

The following equipment shall be provided and installed by the Body Manufacturer:

- Five (5) Telex IP223 adapters
- Two (2) Telex PIB223 adapters
- Seven (7) FS-1 Foot switch petals
- Seven (7) HB3 Plus adapters
- Seven (7) CSoft 12 Line USB software packages

#### **O-1020 : FIRE DEPARTMENT SUPPLIED RADIO(S)**

The HOUSTON FIRE DEPARTMENT will supply seventeen (17) radios and will be installed by the Body Manufacturer. Eight (8) radios will be installed in the Data Rack. Eight (8) radios will be installed in the Forward body, one (1) at each workstation in the body under the desk on the wall, one (1) in the rear conference room. The HOUSTON FIRE DEPARTMENT supplied radios shall be the Motorola ATS.

#### **O-1030 : MDT INSTALLATION**

Wiring provisions for a HOUSTON FIRE DEPARTMENT supplied MDT will be installed in the cab at the Officer's position.



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **O-1040 : COMPUTERS**

Seven (7) Dell Optiplex 960 computers shall be provided at various locations on the truck with Intel® Core 2 QUAD 9650 (3.0hz, 12M, 1333MHz FSB)

- **Operating System(s):** Genuine Windows® XP Professional downgrade
- **File System:** NTFS File System for all Operating Systems NTFS
- **Ship Packaging Options:** Shipping Material for System, Small Form Factor
- **Memory:** 2.0GB DDR2 Non-ECC SDRAM, 800MHz, (1 DIMM)
- **Video Card:** 256MB ATI Radeon 3450 Graphics, Dual Monitor VGA (TV-out), low profile
- **Monitors:** One (1) Dell 17 inch UltraSharp™ 1708FP Flat Panel, VGA/DVI one (1) ELO 17" Touch Screen Monitor
- **Keyboard:** Dell USB Keyboard, No Hot Keys
- **Mouse:** Dell USB 2-Button Entry Mouse with Scroll, Black
- **Boot Hard Drives:** 160GB SATA 3.0GB/s and 8MB DataBurst Cache™
- **Floppy Drive and Media Reader:** No Floppy Drive NFD
- **Removable Media Storage Devices:** 16x DVD+/-RW Roxio Creator™ CyberlinkPowerDVD™
- **Basic Systems Management Mode:** ASF Basic Hardware Enabled Systems Management BCSM
- **Resource CD and DVD:** Dell OptiPlex Systems RCD
- **Speakers:** Dell AX510 Sound Bar for all UltraSharp Flat Panel Displays
- **Hardware Support Services:** Three (3) Year Basic Limited Warranty and three (3) Year NBD On-Site Service

#### **O-1050 : REMOTE USB PORTS**

There shall be four (4) remote USB ports per computer workstation in the desktop component consoles for a total of seven (7) 4-way USB remote ports. Two (2) shall be for the Keyboard and mouse. Two (2) shall be for use with a flash drive.

#### **O-1060 : LAPTOPS**

Two (2) HP 8530p Laptops with Intel Core2 Duo T9400 8530p Processor will be provided to be used with the Telex Radio Interoperability system.

- **Operating System(s):** Windows Vista with Windows XP Professional Downgrade
- **File System:** NTFS File System for all Operating Systems NTFS
- **Memory:** 2.0GB DDR2, 800Mhz, (1 DIMM)
- **Video Card:** ATI HD 3650 256MB 35wCPU
- **Screen:** 15.4" WSXGA+WVA 35w
- **Boot Hard Drives:** 120GB 5400RPM Hard drive
- **Networking:** Intel 802.11 a/b/g/n 13 card and Bluetooth 2.0 module
- **Optical Drives:** DVD RW LS UB 8530p Drive

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **O-1070 : STORAGE SERVER**

There shall be one (1) HP ProLiant DL 180 G6 Server with One Quad-Core Intel Xeon Processor E5504 2.0Ghz 4M Processor.

- **Operating System(s):** Windows Server 2008 Standard Edition
- **File System:** NTFS File System for all Operating Systems NTFS
- **Memory:** 4.0GB PC3-10600E 4x1 GB
- **Boot Hard Drives:** 1TB 5400RPM Hard drive
- **Optical Drives:** Slim 12.7mm SATA DVD-RW Optical Drive
- **Networking:** Integrated Dual Port Gigabit Server Adapter

#### **O-1080 : 40" LCD AND SMARTBOARD**

Two (2) Samsung 400PXN 40" LCD flat screen monitors shall be provided and installed. One (1) shall be installed centered on the forward bulkhead wall. One (1) shall be installed in the Rear Conference Room curbside slide-out.

A Smart Tech PX340 Smartboard overly shall be provided over the flat screen monitors above.

There shall be two (2) Dell Optiplex 960 provided. One (1) for each smartboard and shall be installed to close proximity to its corresponding monitor and overlay. Each computer will come with a wireless keyboard with a mouse scroll pad function, one (1) computer for a total of (2).

#### **O-1090 : RECORDING DEVICES**

The HOUSTON FIRE DEPARTMENT supplied NetDVMS system shall record all video sources on the command vehicle. The Body Manufacturer will integrate the SVI supplied video system with the HOUSTON FIRE DEPARTMENT supplied NetDVMS system.

#### **O-1100 : COMMAND CAMERA SYSTEM**

There shall be one (1) Bosch MIC412TIBUP13636N Thermal camera complete with pan & tilt drive system, robust enclosure with shield and wiper, high quality camera and lens. The camera system shall be a high resolution unit with FLIR Thermal imaging technology and IR capabilities, and a 176X zoom lens (36X optical, 12X digital).

The control of camera shall be achieved through the Video/Audio control system.

#### **O-1110 : DATA SATELLITE SYSTEM**

The system shall provide broadband Internet connections from the vehicle while on scene. The vehicle computer network shall be wired to the satellite equipment so that Internet access is shared by the network. The speed of the connection (bandwidth) will be determined by the plan that is selected by the HOUSTON FIRE DEPARTMENT before the unit is delivered. The broadband Internet connection shall be provided by the installation of a C-Com Satellite Systems 980 Series satellite.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **O-1120 : DATA SATELLITE PLAN**

Prepaid by SVI for 24 months. 1mbps x 512kbps TDMA Mobile Command Recover with 30 Days include usage of Satellite Airtime Services with 48kbps CIR for VoIP. Include 5 line ITNS-VoIP Service prepaid for 24 months, with unlimited long distance usage in US.

Fee includes 30 days of usage per year under a 24 month contract commitment for CONUS based services base on Carolina Satellite Networks 8 to one contention rationetwork with included 24/7 365 support.

Daily overage rate is \$85.00 per day. 30 minutes of continuous usage constitutes a day. The HOUSTON FIRE DEPARTMENT will be responsible for the overage charges.

ITNS-VoIP service is non-reliant upon Internet access for service. During delivery and IT VPN testing, the HOUSTON FIRE DEPARTMENT will not incur a charge against 30 day usage. Billing with start upon commissioning Mobile Command Vehicle into active service.

#### **Satellite Features:**

The iNetVu transportable system is an automatic scanner polarizer and beam positioner system for a foldable 2-way satellite antenna. It is designed to automatically find and acquire the satellite beam and the satellite position based on the GPS position reading and other positioning parameters. It is aimed for the nomad users who want to have high speed Internet access in remote locations where cable and DSL do not exist. This allows mobile users with the capability to stop anywhere, under the satellite coverage, and to access Internet over satellite in both directions while maintaining satellite TV signal reception.

While maintaining the same functionality, the transportable dish offers additional capabilities such as:

- Satellite acquisition and lock within 3 minutes or less
- Satellite independent: works with any configured satellite
- Dish pointing is automatic and is fully software controlled
- Optimized signal reception and transmission
- Automatic signal cross polarization with confirmation from the NOC
- Fast reacquisition based on last good position
- System authentication with the service provider
- System monitoring based on GPS location
- Antenna folds automatically upon vehicle movement

The iNetVu transportable system consists mainly of the following components:

- 2-Way Satellite Dish
- 2-Way Modems
- iNetVu Mount
- iNetVu Controller Box, 9000 Series 1-Touch
- iNetVu Mobile 2-way Application

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **O-1130 : TV SATELLITE SYSTEM**

One (1) KVH Trac Vision model R6DX "In-Motion" satellite receiver shall be provided on roof of apparatus body. This satellite receiver is designed exclusively for mobile users (RV's, boats, buses). The KVH Trac Vision R6 is 12" H x 28" diameter, and weighs 28 pounds. The R6 satellite receiver is equipped with an automatic controller so that the antenna automatically aims at the satellite.

The satellite shall be located so that it does not interfere with operation of other roof mounted equipment.

Satellite dish shall be provided with dual LNB capability and wired so that multiple receiver(s) can be used with system.

There shall be a total of (4) Direct TV satellite receivers, three (3) DIRECTV model H21 HD receivers and one (1) HR22 DVR HD receiver located in the 19" Data Rack.

#### **O-1140 : TV SATELLITE PLAN**

Pre paid by the Body Manufacturer for 24 months. The office Choice package with 130+ channels including all news stations. All local TV stations included.

#### **O-1150 : AUDIO/VIDEO ROUTING AND CONTROL SYSTEM**

There shall be one (1) complete Audio/Video Routing system provided and installed by SVI. The system shall allow for 25 inputs and 21 outputs. Each monitor connected to the video routing system will be capable of displaying four (4) video inputs simultaneously on one monitor.

Four (4) iEi PPC-2706GHS 6" Touch Panel PCs shall be provided and located:

- Two (2) in streetside slide-out
- One (1) in curbside slide-out
- One (1) in Conference Room

The touch panels shall communicate with the audio/video routing system to control the viewable inputs for each monitor, the Broadcast TV tuner, DirecTV receivers, the two (2) 40" LCDs, and the Pelco camera.

#### **O-1160 : BROADCAST TV**

One (1) Winegard RV3095 crank up TV antenna shall be installed on the body roof. The RV3095 is capable of receiving HDTV and Analog TV signals.

Four (4) Contemporary Research ATSC Digital TV Tuners shall be installed in the Audio/Video Data Rack.

#### **O-1170 : BRG ATOMIC CLOCKS**

One (1) BRG Atomic Clock model AC12-01-10-01-R-GP-ST-P06-B1-F1 will be located in the forward body. One (1) BRG Atomic Clock slave unit model AC12-01-10-01-R-SR-ST-P06-B1-F1 will be located in the rear body.

There shall be two (2) BRG Timers model AM12-01-10-01-R-WR-P06-B1-F1 provided and installed. One (1) shall be located in the forward body, and one (1) shall be located in the rear body.

# **HOUSTON FIRE DEPARTMENT**

## **COMMAND VEHICLE**

### **BID SPECIFICATION**

#### **O-1180 : WEATHER STATION**

A Climatronics TACMET II weather station shall be provided as a wired system. The TACMET II Weather Station (P/N 102304) has been fielded in a number of programs requiring real-time surface weather input. This rapidly deployable, compact, self-contained system is packaged in one or two rugged cases, one for the sensor, battery and optional solar panel and the other for the tripod and "quik"-mount. The system requires very little power and can be operated from a wide variety of both AC and DC power sources. The system is easily deployed and ready to operate in less than five minutes without tools and requiring no orientation or calibration.

The TACMET II may also be vehicle mounted and its compact size does not compete for storage or deployment space in these applications. Data is transmitted either via wire or wirelessly via an internal spread spectrum radio to a number of commonly available display devices.

Climatronics Portable Weather Station can provide real time data for display and analysis using our WeatherView, AWeather, or NOAA Cameo/Aloha software products. The digital output is easily integrated into almost any existing or planned data and display system applications. Weatherview and AWeather run on either a Laptop or PDA, Cameo/Aloha with Marplot (for detailed area specific plume dispersion display/tracking) requires a laptop.

#### **O-1190 : DATA RACKS**

Two (2) MRK2426 with 4 fan top, locking side panels, and locking solid steel doors shall be provided and installed in the forward body between the two (2) slide-outs.

#### **O-1200 : EXTERNAL PATCH PANEL**

There shall be one (1) external patch panel provided on the rear of the body. The patch panel shall include the following

- Four (4) POTS lines
- Two (2) phone jacks
- Two (2) network jacks
- One (1) set of RCA video/audio inputs

#### **O-1210 : MONITORS**

There shall be four (4) 27" HD Samsung commercial grade flat screen monitors mounted in the rear Conference room passenger side slide out. The monitors shall be connected to the Audio/Video system and shall be able to view any of the video sources on the vehicle.

#### **O-1220 : EXTERNAL 32" LCD COMPARTMENT**

There shall be one (1) external compartment located on the forward streetside slide out. A 32" LCD HD monitor with mount shall be provided and installed. The 32" LCD will be controlled for a specified iEi control station inside the body so that any video source can be sent to it for viewing

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **O-1230 : NETWORK & PHONE SYSTEM**

SVI will provide a Cisco based Computer Network system with fourteen (14) Cisco IP Phones. One (1) phone per workstation in the Command Body. One (1) Conference Room conference phone. Three (3) phones in the rear slide-out, one (1) per workstation. One (1) phone will be installed in the exterior phone box. Two (2) phones will be shipped loose.

The Phone system shall have three (3) Cellular lines, five (5) VoIP lines, four (4) POTS lines and two (2) Satellite phone lines. Satellite capability will be available to all phones, but can only be accessed by using a numeric code. When the VoIP lines are unavailable they shall be forwarded to the cellular lines.

The two (2) Satellite phones will come with a two (2) year plan 30 minute/month service will be through Carolina sat net .

The System shall be WiFi capable there shall be one (1) WiFi antenna located on the body antenna rail. There shall be an integrated WiFi access point in the Cisco Router.

There will be a total of twenty four (24) network jacks:

- Four (8) in the forward streetside slide-out
- Three (6) in the forward curbside slide-out
- Three (6) in the rear streetside slide-out
- One (2) in the rear Conference Room
- Two (2) in the exterior patch panel

There will be a total of twelve (12) phone jacks:

- Four (4) in the forward streetside slide-out
- Three (3) in the forward curbside slide-out
- One (1) in the rear streetside slide-out
- One (1) on the rear Conference Room table
- One (1) in the external curbside phone box
- Two (2) in the external body patch panel

## **O-1240 : SURVELANCE CAMERAS**

There shall be Four (4) Bosch LTC1421/20 Cameras on the body. Two (2) cameras will be located on the curbside of the body and two (2) cameras shall be located on streetside of the body.

## **O-1250 : CUSTOMER SUPPLIED AXIS CAMERA**

The Body Manufacturer shall install a HOUSTON FIRE DEPARTMENT supplied AXIS camera on the Wilburt mast below the Bosch thermal camera.

## **O-1260 : SEVEN (7) ANTENNAS - RAIL MOUNTED BODY ROOF**

There shall be six (6), radio antenna rail(s) provided and installed on the roof of the body. The rails shall be constructed of aluminum, forming a two (2) piece box design. The top section shall be removable for easy access to the individual antenna wiring. Total of seven (7), antenna bases shall be provided and installed in each rail. The bases shall include a minimum of 20' of LMR195 cable. The antenna wiring shall enter the body roof at a single point under the end of the rail.

# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

#### **O-1270 : TELESCOPING PNEUMATIC MAST**

The apparatus shall be equipped with one (1) Will-Burt 7-42 heavy duty pneumatic powered telescoping mast(s). The mast shall utilize air from the chassis brake system. Air to operate the telescoping mast must be drawn from a drier system and be regulated to 20 psig and shall have a back pressure protection valve.

A red flashing warning light will be visible to the driver to warn when a light tower is out of roof nested position.

A pneumatic kit to raise and lower the mast shall include air control valve, 0-160 psig air gauge, regulator, 0-30 psig air gauge.

The mast shall be of a free standing design (non-guyed) and use high strength, heat treated aluminum alloy tubes and collars. Each mast section (tube) shall have two full length external keys and nominal .095" wall thickness collars with matching keyways to maintain directional azimuth.

Each mast section and collar shall be of the low friction synthetic bearings for smooth operation and longer life. Bumpers shall be supplied to reduce shock on extension and retraction. All exterior aluminum surfaces shall be anodized and sealed. Fasteners and fittings shall be plated steel or stainless steel for corrosion resistance.

One (1) maintenance and instruction manual will be provided for the towers on delivery. Wiring schematic, air piping schematic and installation diagrams shall be provided with the manual. Manufacturer's blueprint of tower, complete parts list and bill of materials for towers provided with manuals.

#### **O-1280 : MODEL 7-42 SPECIFICATIONS**

Nested height tower only:	7'-1"
Extended height tower only:	41'-2"
Normal payload capacity:	150 lbs.
Number of sections:	9
Mast Diameter:	9" - 3"
Mast Volume:	7.2 cu. ft.
Collar type:	Non-locking
Maximum operating pressure:	35 psi

The operational envelope of the mast shall be automatically illuminated by a lookup light whenever the mast assembly is being raised as required by NFPA .

#### **O-1290 : NYCOIL WIRING (7-42)**

A 70' Nycoil conduit measuring 1" ID x 16-1/2" OD coil shall be provided for the 7-42 telescopic mast.

#### **O-1300 : MAST MOUNTING - EXTERNAL**

The above telescoping mast shall be mounted using an external mounting kit. The mast shall be located on the rear of the body mounted to the rear bumper.

#### **O-1310 : MAST COVER**

There shall be a custom designed, 1/8" smooth aluminum cover (painted body color) provided to store control cables, air hoses, and to protect the mast from the elements. The cover shall be easily removed to allow access to mast for maintenance.

# **HOUSTON FIRE DEPARTMENT COMMAND VEHICLE BID SPECIFICATION**

## **O-1320 : MAST SAFETY SYSTEM**

Provide and install Will-Burt D\_TEC mast safety system. System shall consist of the following features:

- High voltage sensor aides operator in detecting overhead power lines
- Anti-collision sensor automatically stops mast extension, assisting operator in detecting overhead obstructions
- Tilt sensor that will ensure vehicle is level and D-TEC is pointing directly upward prior to mast extension
- 35 watt quartz halogen look-up spot light. Look-up light illuminates area directly above the telescoping mast



# HOUSTON FIRE DEPARTMENT

## COMMAND VEHICLE

### BID SPECIFICATION

## Section P

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### P-1000 : EQUIPMENT

The following equipment shall be furnished with the completed Special Service vehicle;

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- There shall be two (2) NFPA approved folding aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.
  - The wheel chock(s) shall be mounted on the apparatus, location as per the HOUSTON FIRE DEPARTMENT.
- Two (2) Streamlight Fire Vulcan **LED** flashlights. Each flashlight shall be orange in color. Each flashlight shall have a 12 volt DC charger and vehicle mount kit. The flashlights shall be wired to batteries direct, unless otherwise specified by the HOUSTON FIRE DEPARTMENT. **NOTE:** The Body Manufacturer will ship the flashlights loose with the apparatus for Metro Fire Apparatus to install per the HOUSTON FIRE DEPARTMENT's instructions.



# Change Order #1

Customer: **Houston Fire Department**

Date: 9/30/2009

SVI #: 750

## Change Order Description Pre Constructiuron Changes

**Based on the following changes/modifications to the specifics, (0) days will be added to the quoted delivery time.**

Item #	Spec Section	Item Description	Dealer Net Cost	Dealer Markup % 0.00%	Dealer Adjusted Price	Dealer Profit	Unit Cost (In US \$)	Change Accepted?
1	SPARTAN	The VDR come with programing for laptops and cabeling?	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
3	SPARTAN	Ensure Fuel filter is installed inside frame rails	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
4	SPARTAN	Relocate parking brake to be in driver side standard location ILO center left panel - make sure to include guard	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
5	SPARTAN	Power sirens both sirens through vista switches in the main screen	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
6	SPARTAN	Spartan to pre drill license plate holes center between right hand frame rail and 100w electric siren speaker. Do this prior to paint. 2233-002	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
7	SPARTAN	Delete cab door trim reflective - SVI to supply	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
8	SPARTAN	Change intior Line X color to black ILO red	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
9	SPARTAN	Add Stainless trim on the lower front radius	\$98.00	0.00%		\$0.00	\$98.00	<input checked="" type="checkbox"/> YES
10	SPARTAN	Change Interior overhead lighting to LED	\$308.00	0.00%		\$0.00	\$308.00	<input checked="" type="checkbox"/> YES
11	SPARTAN	Change All Cab Warning Lights to M Series Whelen	\$2,880.00	0.00%		\$0.00	\$2,880.00	<input checked="" type="checkbox"/> YES
12	SPARTAN	Change Location of side warning light to behind the front axle ILO over it	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
13	SPARTAN	Change Door Warning light to TIR 6 Whelen Red/Amber 5407-009	\$86.00	0.00%		\$0.00	\$86.00	<input checked="" type="checkbox"/> YES
14	SPARTAN	Change rear axle interlock switch from center dash to a virtual button in the secondary menu under the vista display	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
15	SPARTAN	Delete (2) switches from center panel	(\$93.00)	0.00%		\$0.00	(\$93.00)	<input checked="" type="checkbox"/> YES
16	Warning Lights	Change All Body Warning Lights to M9 Series Whelen	\$7,383.00	0.00%		\$0.00	\$7,383.00	<input checked="" type="checkbox"/> YES
17	SPARTAN	Add Tap II feature to horn on steering wheel to control electric siren	\$110.00	0.00%		\$0.00	\$110.00	<input checked="" type="checkbox"/> YES
18	Cab/Chassis Mods	FD is wanting a PDF center dash Layout for approval	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
19	BODY	Add flush mount door exterior curbside body above compartment C1 to house cab tilt control pendant, the cab tili control shall be hard mounted inside this compartment.	\$1,525.00	0.00%		\$0.00	\$1,525.00	<input checked="" type="checkbox"/> YES
20	Compartment S4	Relocate Frog D Generator monoitoring panel to Interior walkin body, above entry door, next to FRC Tach Plus	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
21	Compartment C3	Change wheel chock mounting to ship loose with truck	(\$125.00)	0.00%		\$0.00	(\$125.00)	<input checked="" type="checkbox"/> YES
22	Compartmentation	Change Turtle tile color to Black ILO red leaving edging yellow	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
23	Rubrials	Change rubrail striping to all white	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
24	Emergency Lighting	Change Zone C Upper rear Warning Lights to RED/BLUE Split Whelen M9 900 sreies with Clear Lens	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
25	Emergency Lighting	Change Zone B/D upper side rear warning lights to be RED/BLUE Split M9 900 Series with clear Lens	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
26	Emergency Lighting	Change Zone B/D upper side forward warning lights to be RED/BLUE Split M9 900 Series with clear Lens	\$0.00	0.00%		\$0.00	\$0.00	<input checked="" type="checkbox"/> YES
27	Interior body	Change all interior body to carpet - same as Salines #699 - Ryan Has Sample at desk	\$862.00	0.00%		\$0.00	\$862.00	<input checked="" type="checkbox"/> YES
			<b>\$13,034.00</b>			<b>\$0.00</b>	<b>\$13,034.00</b>	

Authorized Dealer Signature:

Date Accepted:

Authorized SVI Signature:

Date Accepted:

**APPROVED**

**By Ryan Wells at 10:04 am, Oct 28, 2009**



# Change Order #2

Customer: **Houston Fire Department**

Date: 5/14/2010

SVI #: **750**

## Change Order Description

### **Credit For Chassis Pre Pay**

**Based on the following changes/modifications to the specification, ( 0 ) days will be added to the quoted delivery time.**

Review each item for change description and price. Check the appropriate response for each item, sign and date form at bottom, and fax completed form to SVI Trucks at (970) 667-3343.

Prices shown above are per unit (ea truck) prices unless otherwise noted. All work to be performed under same terms and conditions as specified in original contract unless otherwise stipulated. Change Order documentation will override specification in cases of conflicting documentation.

Item #	Spec Section	Item Description	Dealer Net Cost	Dealer Markup %	Dealer Adjusted Price	Dealer Profit	Unit Cost (In US \$)	Change Accepted?
1	Spartan Pre Pay	Credit For Chassis Pre Pay	(\$9,890.00)	0.00%		\$0.00	(\$9,890.00)	<input checked="" type="checkbox"/> YES
Change Order Total:			(\$9,890.00)			\$0.00	(\$9,890.00)	<input checked="" type="checkbox"/>

Authorized Customer Signature:

Date Accepted:

Authorized Dealer Signature:

Date Accepted:

Authorized SVI Signature:

Date Accepted:

*This change order is not valid until signed by all parties listed above.*



# Change Order #3

Customer: **Houston Fire Department**

Date: 7/22/2010

SVI #: 750

## Change Order Description Wiring Inspection Changes

**Based on the following changes/modifications to the specification, ( 0 ) days will be added to the quoted delivery time.**

Review each item for change description and price. Check the appropriate response for each item, sign and date form at bottom, and fax completed form to SVI Trucks at (970) 667-3343.

Prices shown above are per unit (ea truck) prices unless otherwise noted. All work to be performed under same terms and conditions as specified in original contract unless otherwise stipulated. Change Order documentation will override specification in cases of conflicting documentation.

Item #	Spec Section	Item Description	Unit Cost (In US \$)	Change Accepted?
1		Touch up under body coating in area of rear wheel wells	\$0.00	<input checked="" type="checkbox"/> YES
2		Add third cruise air A/C unit to meet required cooling specifications, locate the the condenser in the rear exterior lower curbside compartment and locate the evaporator in the curbside rack area.	\$0.00	<input checked="" type="checkbox"/> YES
3		SVI to design A/C System for maximum efficiency throught the command body.	\$0.00	<input checked="" type="checkbox"/> YES
4		Locate pendant for mast control/awning and slie out inside a cast products telephone box on the rear mast cover - ensure pendant is on a minimum of a 10' cord.	\$0.00	<input checked="" type="checkbox"/> YES
5		Change the shore power plug from 100 amp to 150 amp per Steve Greenhagen. - This is due to adding the third A/C Unit.	\$0.00	<input checked="" type="checkbox"/> YES
Change Order Total:			<b>\$0.00</b>	<input checked="" type="checkbox"/>

Authorized Customer Signature:	<b>APPROVED</b> <i>By Ryan Wells at 9:42 am, Jul 22, 2010</i>	Date Accepted:
Authorized Dealer Signature:		Date Accepted:
Authorized SVI Signature:		Date Accepted:

*This change order is not valid until signed by all parties listed above.*



# Change Order #4

Customer: **Houston Fire Department**

Date: 9/8/2010

SVI #: 750

## Change Order Description

**9/7/2010 Inspection**

**Based on the following changes/modifications to the specification, ( 0 ) days will be added to the quoted delivery time.**

Review each item for change description and price. Check the appropriate response for each item, sign and date form at bottom, and fax completed form to SVI Trucks at (970) 667-3343.

Prices shown above are per unit (ea truck) prices unless otherwise noted. All work to be performed under same terms and conditions as specified in original contract unless otherwise stipulated. Change Order documentation will override specification in cases of conflicting documentation.

Item #	Spec Section	Item Description	Unit Cost (In US \$)	Change Accepted?
1	Cab/ Chassis	Change configuration of the cab EMS compartment to add a module to hold the forward conference table, vertically to pull off the curbside, will need to wall off the module as deep as the table top goes and leave the streetsoide remaing opne storage. There will need to be (2) On Scene straps, (1) on the streetside and (1) on the curbside to prevent items inside the module from coming in contact with the roll up door. Will have to shorten the width of both 1000 lbs trays and both adjustable shelves to accomodate this module. No cost due to a Contract Administration miss at the preconstruction meeting.	\$0.00	<input checked="" type="checkbox"/> YES

Change Order Total: **\$0.00** ☐

Authorized Customer Signature:

Date Accepted:

**APPROVED**

**By Ryan Wells at 9:25 am, Sep 08, 2010**

Authorized Dealer Signature:

Date Accepted:

Authorized SVI Signature:

Date Accepted:

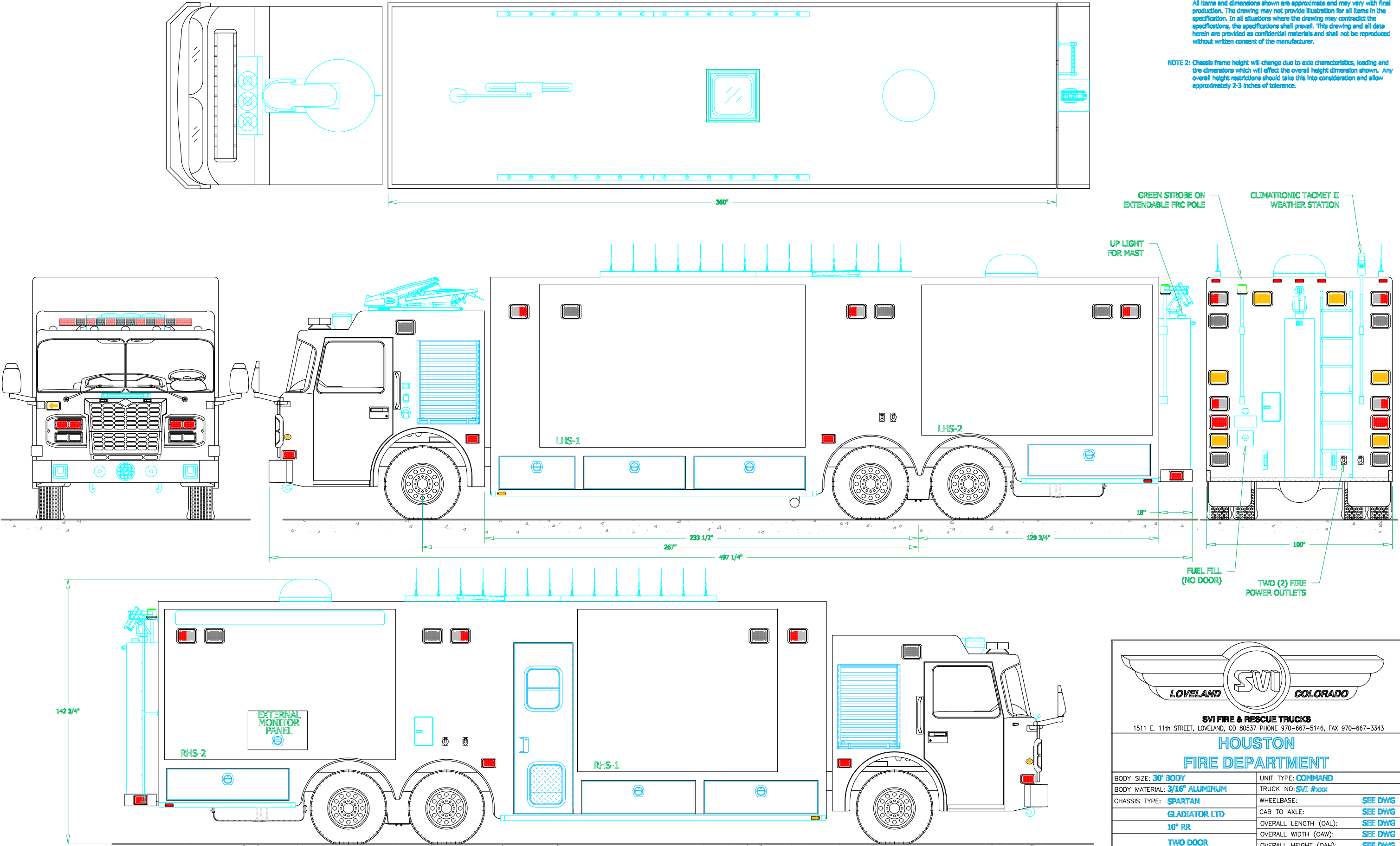
*This change order is not valid until signed by all parties listed above.*

PRELIMINARY DRAWING - FOR LAYOUT PURPOSES ONLY

REVISIONS			
REV	DESCRIPTION	DATE	BY

NOTE 1: Do not scale drawing. This drawing is for general truck configuration only. All items and dimensions shown are approximate and may vary with final production. The drawing may not provide illustration for all items in the specification. In all situations where the drawing may contradict the specifications, the specifications shall prevail. This drawing and all data herein are provided as confidential materials and shall not be reproduced without written consent of the manufacturer.

NOTE 2: Chassis frame height will change due to axle characteristics, loading and tire dimensions which will effect the overall height dimension shown. Any overall height restrictions should take this into consideration and allow approximately 2-3 inches of tolerance.



SVI FIRE & RESCUE TRUCKS  
1511 E. 11th STREET, LOVELAND, CO 80537 PHONE 970-667-5146, FAX 970-667-3343

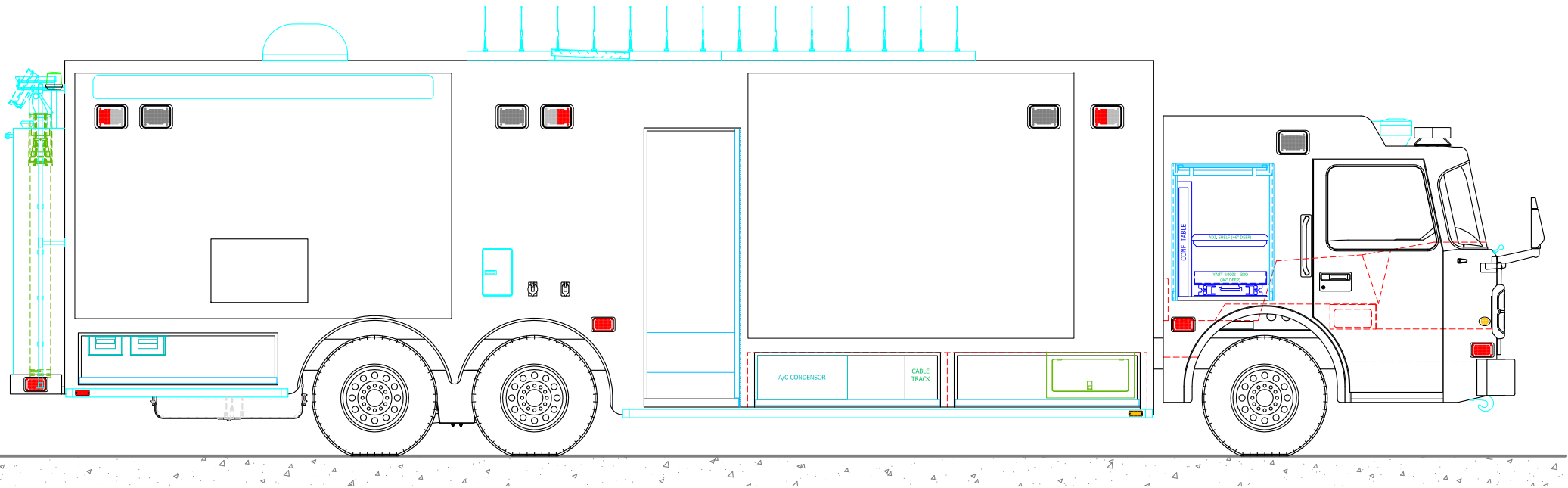
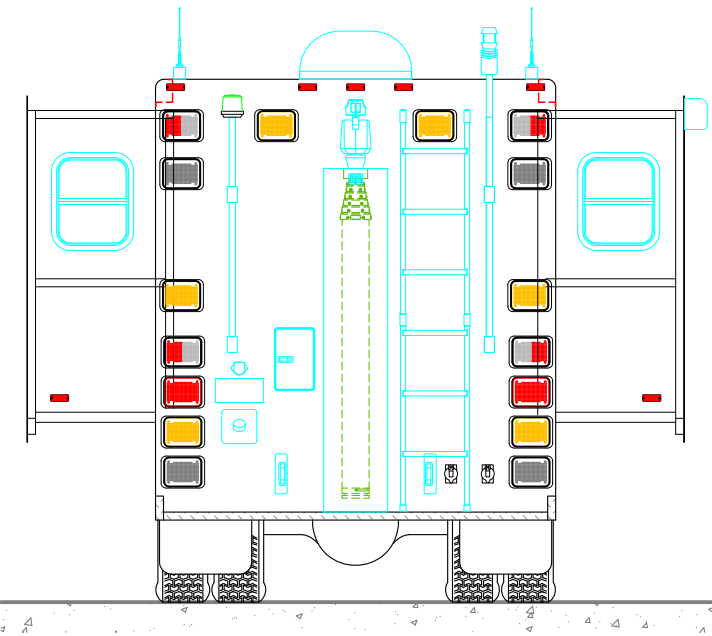
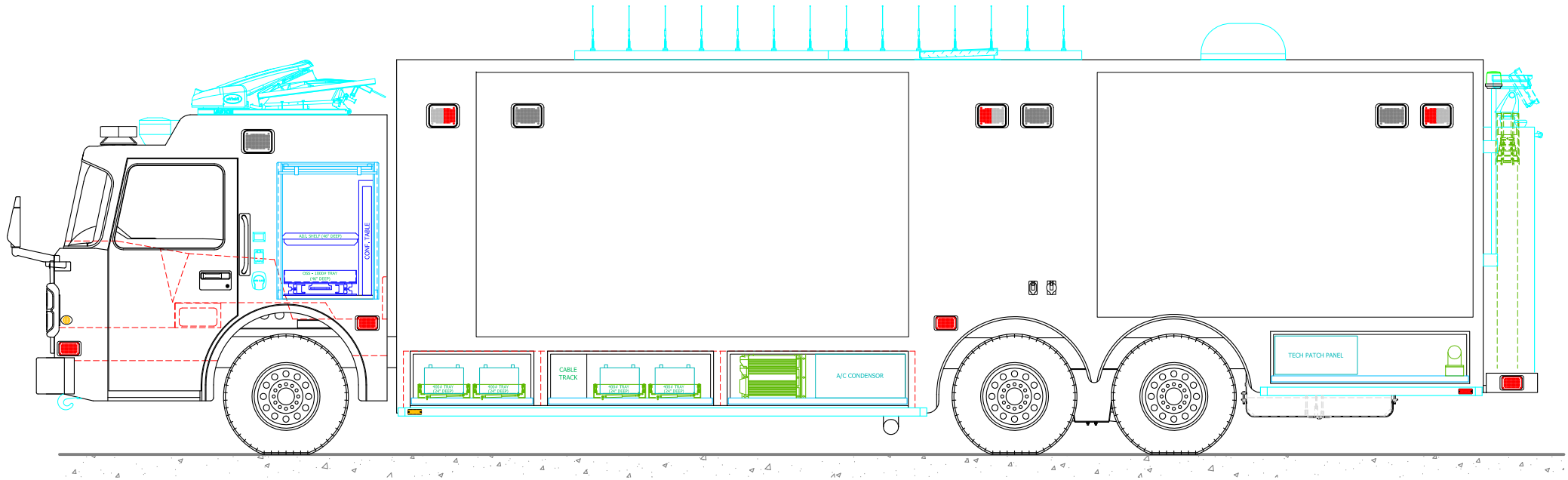
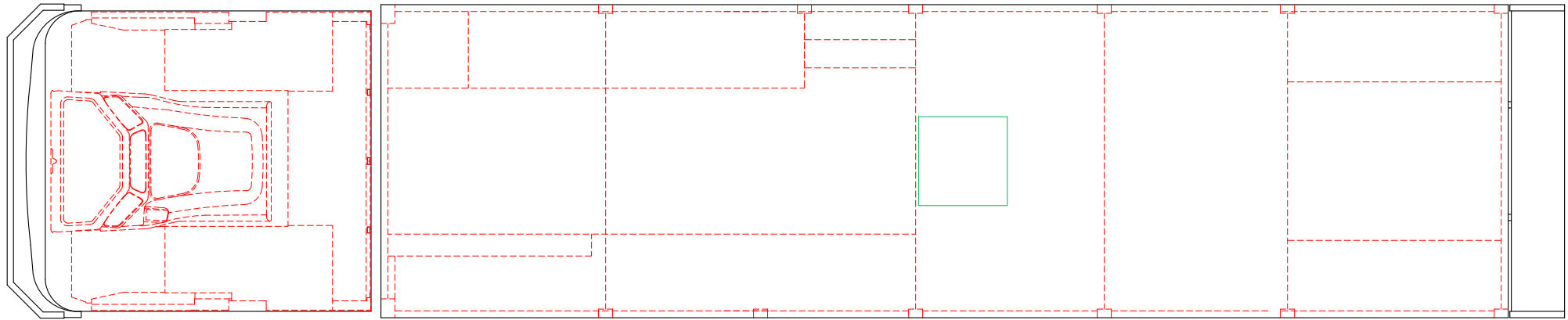
HOUSTON  
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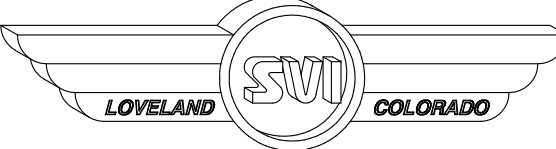
BODY SIZE: <b>30' BODY</b>	UNIT TYPE: <b>COMMAND</b>
BODY MATERIAL: <b>3/16" ALUMINUM</b>	TRUCK NO: <b>SVI #100X</b>
CHASSIS TYPE: <b>SPARTAN</b>	WHEELBASE: <b>SEE DWG</b>
<b>GLADIATOR LTD</b>	CAB TO AXLE: <b>SEE DWG</b>
<b>10" RR</b>	OVERALL LENGTH (OAL): <b>SEE DWG</b>
<b>TWO DOOR</b>	OVERALL WIDTH (OAW): <b>SEE DWG</b>
	OVERALL HEIGHT (OAH): <b>SEE DWG</b>

PRELIMINARY DRAWING - FOR LAYOUT PURPOSES ONLY

REVISIONS			
REV	DESCRIPTION	DATE	BY

NOTE 1: Do not scale drawing. This drawing is for general truck configuration only. All items and dimensions shown are approximate and may vary with final production. The drawing may not provide illustration for all items in the specification. In all situations where the drawing may contradict the specifications, the specifications shall prevail. This drawing and all data herein are provided as confidential materials and shall not be reproduced without written consent of the manufacturer.





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SVI FIRE & RESCUE TRUCKS  
1511 E. 11th STREET, LOVELAND, CO 80537 PHONE 970-667-5146, FAX 970-667-3343

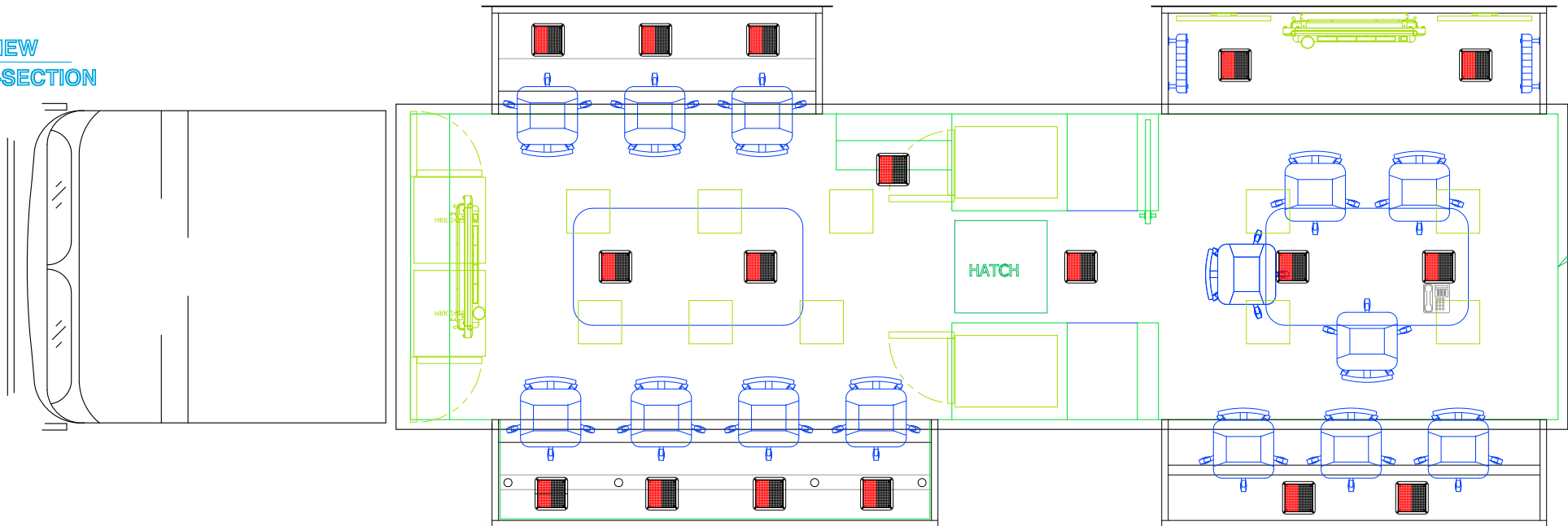
HOUSTON  
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DRAWN BY: HDR	DATE: June 10, 2009	SCALE: 1/4" = 1'-0"
DRAWING NO: Houston_TX_CM_Prelim7		SHEET 2 OF 4



PRELIMINARY DRAWING - FOR LAYOUT PURPOSES ONLY

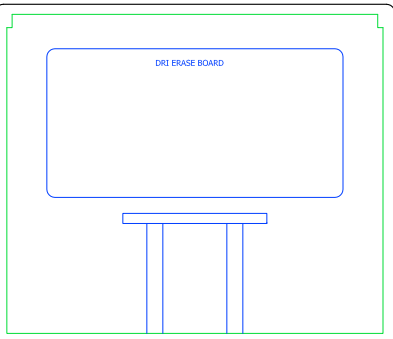
PLAN VIEW  
CROSS-SECTION



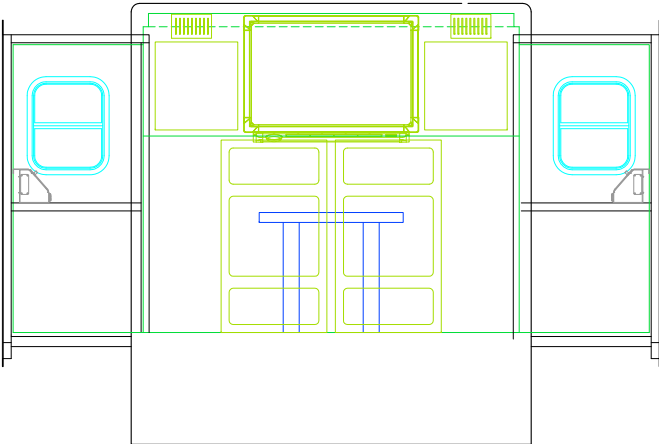
REVISIONS			
REV	DESCRIPTION	DATE	BY

NOTE 1: Do not scale drawing. This drawing is for general truck configuration only. All items and dimensions shown are approximate and may vary with final production. The drawing may not provide illustration for all items in the specification. In all situations where the drawing may contradict the specifications, the specifications shall prevail. This drawing and all data herein are provided as confidential materials and shall not be reproduced without written consent of the manufacturer.

DRI ERASE BOARD  
FULL WIDTH

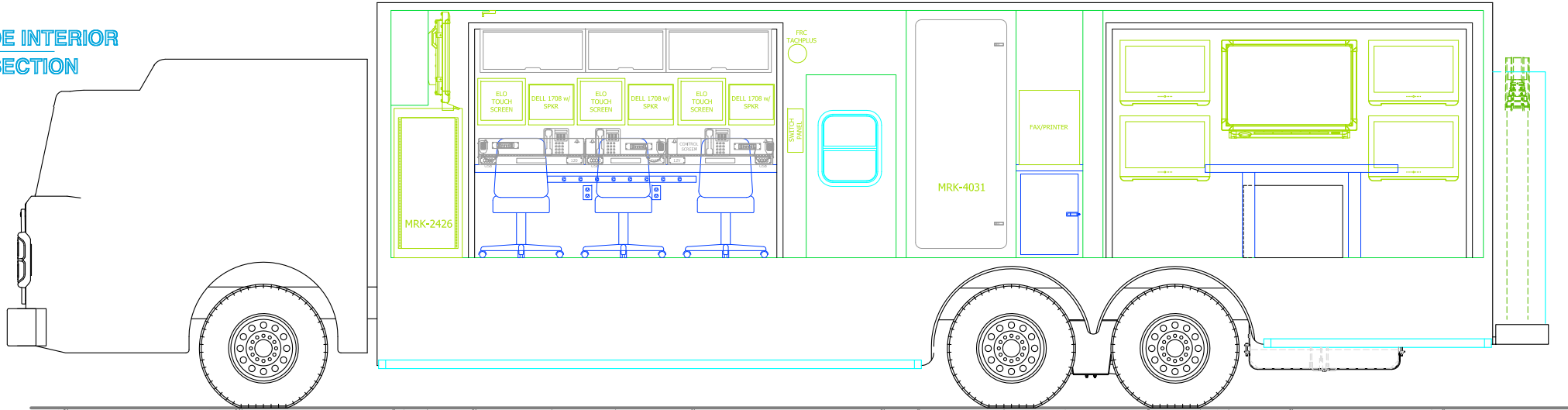


REAR VIEW  
CROSS-SECTION

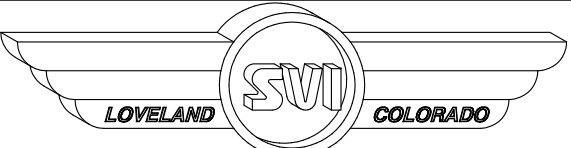
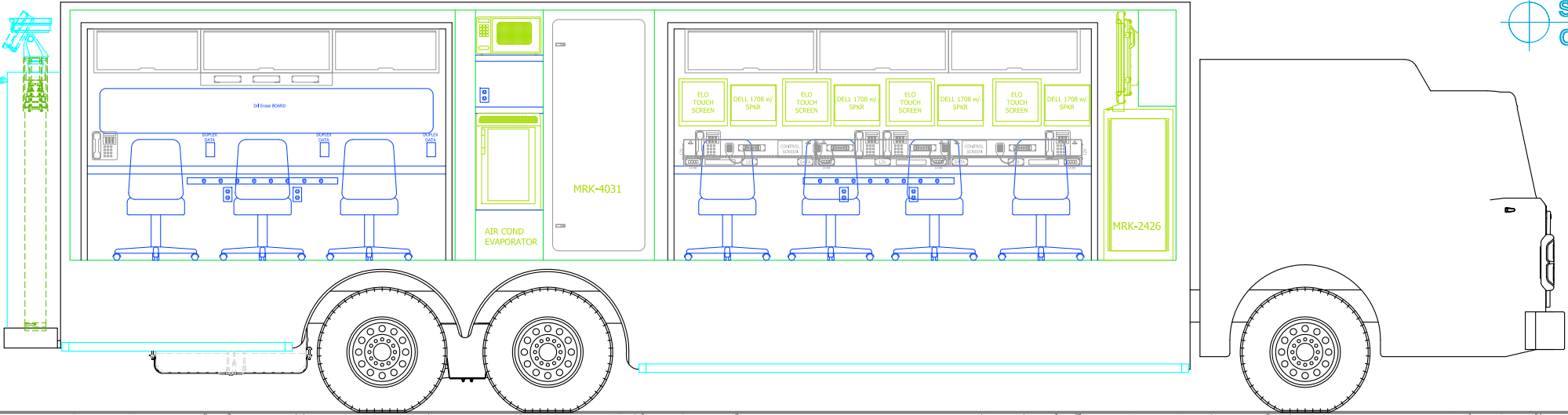


FRONT VIEW  
CROSS-SECTION

CURBSIDE INTERIOR  
CROSS-SECTION



STREETSIDE INTERIOR  
CROSS-SECTION



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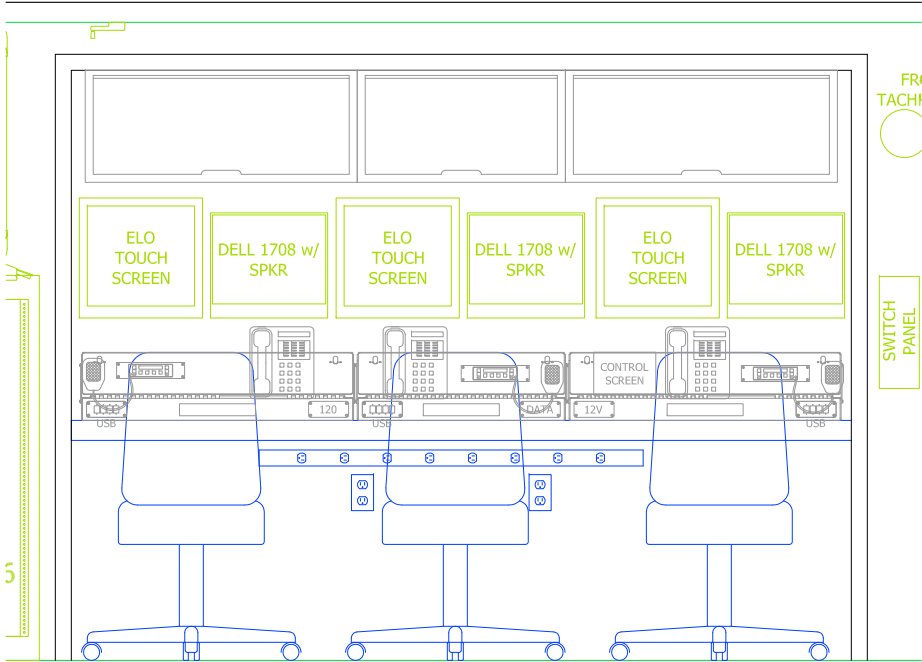
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FIRE DEPARTMENT



PRELIMINARY DRAWING - FOR LAYOUT PURPOSES ONLY

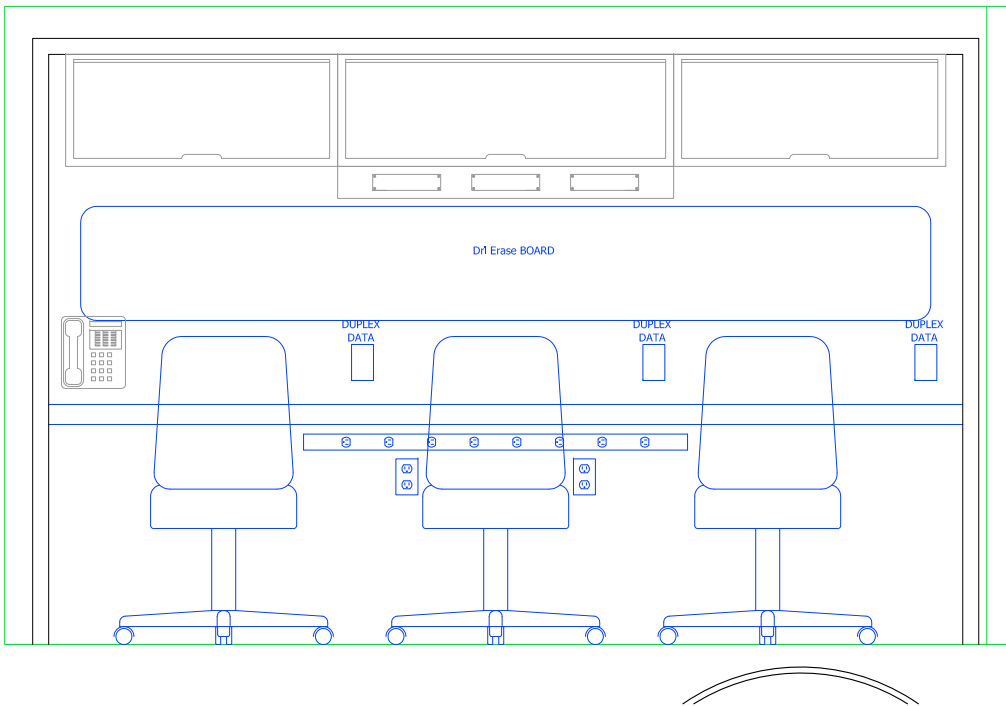
REVISIONS			
REV	DESCRIPTION	DATE	BY

NOTE 1: Do not scale drawing. This drawing is for general truck configuration only. All items and dimensions shown are approximate and may vary with final production. The drawing may not provide illustration for all items in the specification. In all situations where the drawing may contradict the specifications, the specifications shall prevail. This drawing and all data herein are provided as confidential materials and shall not be reproduced without written consent of the manufacturer.

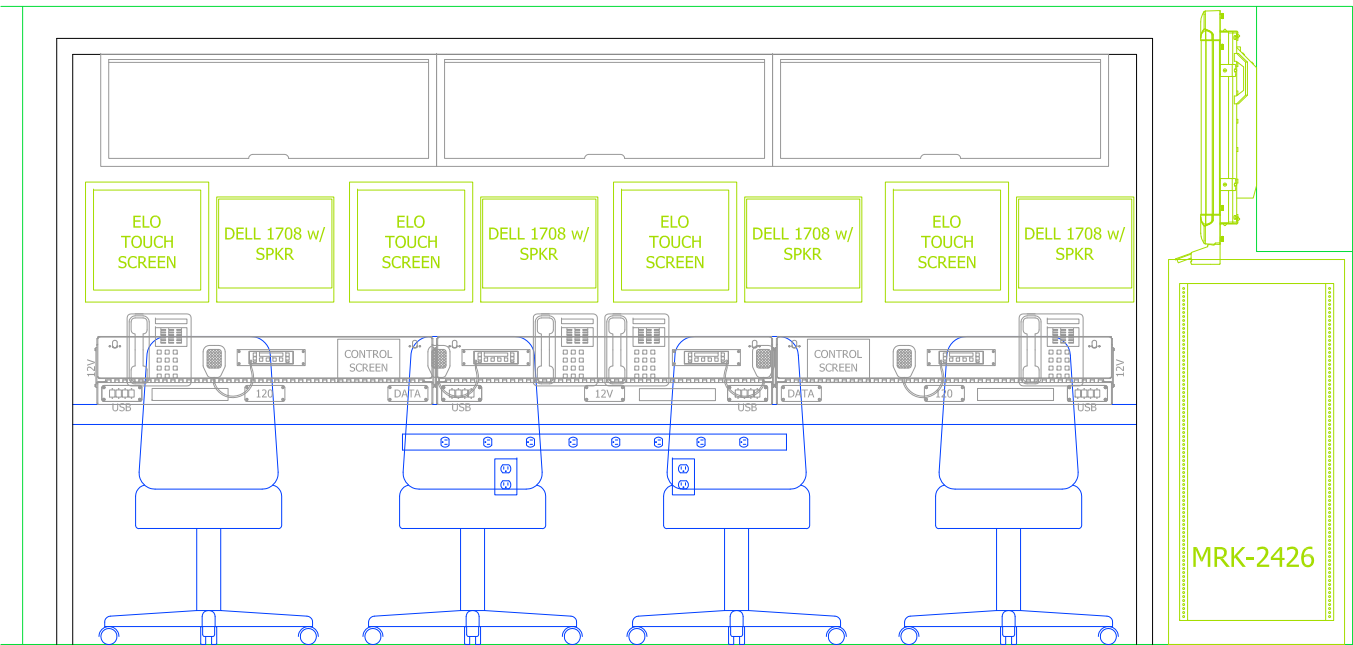


CURBSIDE INTERIOR  
ENLARGED CROSS-SECTION

STREETSIDE INTERIOR  
ENLARGED CROSS-SECTION



STREETSIDE INTERIOR  
ENLARGED CROSS-SECTION





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DRAWING NO: Houston_TX_CM_Prelim7		SHEET 4 OF 4