Winnipeg, MB
Hazmat SVI# 1146
Production Specification

ROCK SOLID QUALITY

INTERNET IN-PROCESS SITE

The manufacturer shall post and maintain a website where the Winnipeg Fire Paramedic Service will be able to view digital images of their apparatus as its being built. 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 unit.

RESPONSIBILITY OF PURCHASER

It shall be the responsibility of the purchaser to specify the details of the apparatus in addition to the requirements in NFPA 1901 needed by the manufacturer to build the apparatus, including:

1) Requirements not uniquely specified in NFPA 1901, such as the type of apparatus desired.
2) Any features of the apparatus desired in addition to, or in excess of, the requirements in NFPA 1901.

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.

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,

1. Estimated In-Service Weight,
2. Wheelbase, Turning Clearance Radius,
3. Principal dimensions, Angle of Approach, Angle of Departure,
4. Transmission, 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.

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.

WEIGHT DISTRIBUTION

When the fire apparatus is loaded to its estimated in-service weight, the front-to-rear weight distribution shall be within the limits set by the chassis manufacturer.

The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer under full load and all other loading conditions.

LOAD DISTRIBUTION

The apparatus manufacturer shall calculate the load distribution for the apparatus, and that load distribution plan shall be delivered with the fire apparatus.

The manufacturer shall engineer the fire apparatus to comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines.

The fire apparatus, when loaded to its estimated in service weight, shall have a side-to-side tire load variation of no more than 7 percent of the total tire load for that axle.

Each tire shall be equipped with a visual indicator or monitoring system that indicates tire pressure.

FIRE APPARATUS PERFORMANCE

The fire apparatus shall meet the requirements of this standard at elevations of 2000 ft (600 m) above sea level.

The fire apparatus shall meet all the requirements of this standard while stationary on a grade of 6 percent in any direction.

The fire apparatus shall meet the requirements of this standard in ambient temperature conditions between 32°F (O°C) and 110°F (43°C).

HIGHWAY PERFORMANCE

The apparatus, when loaded to its estimated in-service weight, shall be capable of the following performance while on dry, paved roads that are in good condition:

1) Accelerating from 0 to 35 mph (55 km/hr) within 25 seconds on a 0 percent grade
2) Attaining a speed of 50 mph (80 km/hr) on a 0 percent grade
3) Maintaining a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent

The maximum top speed of fire apparatus with a GVWR over 26,000 lb (11,800 kg) shall not exceed either 68 mph (109 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (95 km/ hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

SERVICEABILITY

The fire apparatus shall be designed to allow the manufacturer's recommended routine maintenance checks of lubricant and fluid levels to be performed by the operator without lifting the cab of a tilt-cab apparatus or without the need for hand tools.

Where special tools are required for routine service on any component of the apparatus, such tools shall be provided with the apparatus.

Apparatus components that interfere with repair or removal of other major components shall be attached with fasteners, such as cap screws and nuts, so that the components can be removed and installed with ordinary hand tools. These components shall not be welded or otherwise permanently secured into place.

FIRE APPARATUS 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 documents:

   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), maximum discharge pressure capability rating, and serial number
   p) Pump transmission make, model, serial number, and gear ratio
   q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
   r) Water tank certified capacity in gallons or liters
   s) Foam tank (if provided) certified capacity in gallons (liters)
   t) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
   u) Paint manufacturer and paint number(s)
   v) Company name and signature of responsible company representative
   w) 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 *(see 13.8.16)*
3) Siren manufacturer's certification of the siren *(see 13.9.1.1)*
4) Written load analysis and results of the electrical system performance tests *(see 13.14.1 and Section 13.15)*
5) Certification of slip resistance of all stepping, standing, and walking surfaces *(see 15.7.4.5)*
6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability *(see 16.2.4.1)*
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 *(see 16.2.4.2)*
8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications *(see 16.3.1)*
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 *(see 16.3.2.2)*
10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test *(see 16.5.2.2)*
11) If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 16.5.2.1, the pump manufacturer's certification of the hydrodynamic test

12) If the apparatus has a fire pump, the certification of inspection and test for the fire pump *(see 16.13.1.1.5 or 16.13.1.2.4 as applicable)*
13) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test *(see Section 17.13)*
14) When the apparatus is equipped with a water tank, the certification of water tank capacity *(see Section 18.6)*
15) If the apparatus has an aerial device, the certification of inspection and test for the aerial device *(see Section 19.24)*
16) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911
17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy *(see 20.10.4.2)* and the final installer's certification the foam proportioning system meets this standard *(see 20.11.2)*
18) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests *(see Section 21.9)*
19) If the apparatus has a line voltage power source, the certification of the test for the power source *(see 22.15.7.2)*
20) If the apparatus is equipped with an air system, air tank certificates *(see 24.5.1.2)*, the SCBA fill station certification *(see 24.9.6)*, and the results of the testing of the air system installation *(see 24.14.5 and 24.15.4)*
21) Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

The contractor shall deliver with the fire apparatus 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)
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 manufacturer's operations and service documents supplied with components and equipment that are installed or supplied by the contractor.

NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE

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

STATEMENTOF EXCEPTIONS

The final-stage manufacturer shall deliver with the fire apparatus either a certification that the apparatus fully complies with all requirements of this standard or alternatively, a Statement of Exceptions specifically describing each aspect of the completed apparatus that is not fully compliant with the requirements of this standard at the time of delivery.

The Statement of Exceptions shall contain, for each noncompliant aspect of the apparatus or missing required item, the following information:

1) A separate specification of the section of the applicable standard for which compliance is lacking
2) A description of the particular aspect of the apparatus that is not in compliance therewith or required equipment that is missing
3) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
4) Identification of the entity that will be responsible for making the necessary post delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance with this standard

Prior to or at the time of delivery of the apparatus, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for final assembly of the apparatus and by an authorized agent of the purchasing entity, indicating mutual understanding and agreement between the parties regarding the substance thereof.

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 following:
   a) The values shown for items 1 - 7
   b) A purchaser-provided list of equipment to be carried with weights
   c) A purchaser-specified miscellaneous equipment allowance

The manufacturer shall engineer and design the fire apparatus such that the completed apparatus, 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.

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 unequipped fire apparatus in feet and inches (meters), the length of the completed fire apparatus in feet and inches (meters), and the GVWR in tons (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.

			Equipment Allowance	
Apparatus Type	**Equip. Storage Area**	**Apparatus Size**	**lb.**	**kg.**
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

TESTING

The completed rescue vehicle shall be third-party, independent, audit-certified through Underwriters Laboratory Canada (ULC) to the current edition of CAN/ULC S515 standards.

ROAD TEST

Each apparatus shall be tested by the manufacturer before delivery to verify that it meets the following criteria;

Tests shall be conducted at a location and in a manner that does not violate local, state or provincial, or federal traffic laws. Tests shall be conducted on a dry, level, paved surface that is free of loose material, oil, or grease. Tests shall be conducted with the water and foam tanks full (water or product).

The apparatus shall accelerate from 0 to 35 mph (55 km/hr) within 25 seconds. The apparatus shall attain a speed of 50 mph (80 km/ hr).

The auxiliary braking system, if so equipped, shall function as intended by the auxiliary braking system manufacturer.

The air service brakes shall bring the apparatus to a complete stop from a speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m).

The hydraulic service brakes shall bring the apparatus to a complete stop from a speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m).

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901standard. 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).

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 ten (10) minutes. Failure of any of these tests shall require a repeat of the sequence.

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 ten (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.

2. ALTERNATOR PERFORMANCE TEST

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.

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 two (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.

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.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

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

UL 120/240 VAC CERTIFICATION

The 120/240 volt electrical system shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 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% 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% of the continuous rated wattage as stated on the power source specification label for a minimum of two (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 ±10% of the voltage stated on the power source specification label during the entire test. Frequency shall be maintained within ±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 NFPA 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% capacity at 150 psi (1000 kPa) net pump pressure. The test shall be permitted to be run concurrently with the pump certification test.

DOCUMENTATION

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

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 one (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 one (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.

WARRANTY

A full statement shall be provided of the warranties for the vehicle(s) being bid. Warranties should clearly describe the terms under which the vehicle manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material and for the applicable period of time after delivery.

Cost of repairs refers to all costs related thereto including, but not limited to, the cost of materials and the cost of labor.

The Body Manufacturer shall warrant all materials and accessories used on the vehicle(s), whether fabricated by manufacturer or purchased from an outside source and will deal directly with the Winnipeg Fire Paramedic Service on all warranty work.

GENERAL LIMITED WARRANTY - TWO (2) YEARS

The vehicle shall be free of defects in material and workmanship for a period of two (2) years or 36,000 miles (or 57,936 kilometers), 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.

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 (or 96,561 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

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 (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

UNDERCOAT WARRANTY

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material 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.

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 (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date. **Pro-rated warranties will not be acceptable.**

GRAPHICS LIMITED WARRANTY

The 3M graphics installation shall be warranted for a period of two (2) years. The 3M materials installed on completed vehicle shall be warranted for seven (7) years. The 3M Diamond grade film (if specified) shall be warranted for ten (10) years.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within four hundred (400) 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 Winnipeg Fire Paramedic Service as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

OVERALL HEIGHT REQUIREMENT

There is no overall height (OAH) restriction for this vehicle.

OVERALL LENGTH REQUIREMENT

There is no overall length (OAL) restriction for this vehicle.

OVERALL WIDTH

The overall width (OAW) of the body at drip rails shall be 102“ (8' - 6"), and body shall be 100" (8' - 4").

ANGLE OF APPROACH

The angle of approach for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

ANGLE OF DEPARTURE

The angle of departure for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

INSPECTION TRIPS

All required inspection trips shall be the financial responsibility of the Winnipeg Fire Paramedic Service, including but not limited to transportation, food and lodging.

DELIVERY AND DEMONSTRATION

The Contractor shall be responsible for the delivery of the completed unit to the Winnipeg Fire Paramedic Service's 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 Winnipeg Fire Paramedic Service regarding the operation, care and maintenance of the apparatus and equipment supplied at Winnipeg Fire Paramedic Service location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Winnipeg Fire Paramedic Service.

After delivery of the apparatus, the Winnipeg Fire Paramedic Service shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment.

CAB CHASSIS SPECIFICATIONS

AXLE CONFIG:	6X4
MISSION:	Requested GVWR: 58000. Calc. GVWR: 58000 Calc. Start / Grade Ability: 20.17% / 2.01% @ 55 MPH Calc. Geared Speed: 77.2 MPH
DIMENSION:	Wheelbase: 311.00, CA: 243.90, Axle to Frame: 128.00
ENGINE, DIESEL:	{Cummins L9 380} EPA 2017, 380HP @ 2000 RPM, 1150 lb-ft Torque @ RPM, 2200 RPM Governed speed, 380 Peak HP (Max), (RATED FOR EMERGENCY VEHICLES ONLY)
TRANSMISSION, AUTOMATIC:	{Allison 3000 EVS} 5th Generation Controls, Close Ratio, 6-Speed with Double Overdrive, with PTO Provision, Less Retarder, Includes Oil Level Sensor
CLUTCH:	Omit Item (Clutch & Control)
AXLE, FRONT NON-DRIVING:	{Meritor MFS-18-133A} Wide Track, I-Beam Type, 18,000-lb Capacity
AXLE, REAR, TANDEM:	{Meritor MT-40-14X-5DCR-P} Single Reduction, 40,000-lb Capacity, with Lube Oil Pump, w/. 5"(12.7mm) Wall Housing Thickness, Driver Controlled Locking Differential in Forward-Rear and Rear-Rear Axle, R Wheel Ends Gear Ratio: 5.29
CAB:	Conventional, Day Cab
TIRE, FRONT:	(2) 385/65R22.5 Load Range J XZY-3 (MICHELIN), 491 rev/mile, 65 MPH, All-Position
TIRE, REAR:	(8) 11R22.5 Load Range H XDN2 (MICHELIN), 497 rev/mile, 75 MPH, Drive
SUSPENSION, REAR, AIR, TANDEM:	{Hendrickson HAS-460-55} 46,000-lb Capacity, 55" Axle Spacing, 9.5" Ride Height, with Shock Absorbers, Mounted Inboard
FRAME REINFORCEMENT:	Full Outer C-Channel, Heat Treated Alloy Steel (120,000 PSI Yield), 10.813" x 3.892" x 0.312" (274.6mm x 98.8mm x 7.9mm), 480.0" (12192mm) OAL
PAINT:	Cab schematic 209WL Location 1: 0001, Canyon Black (Std) Location 2: 2417, Red (Custom) Chassis schematic 932WL Wheel: 0001, Canyon Black (Std)

Description
Base Chassis, Model HV607 SBA with 311.00 Wheelbase, 243.90 CA, and 128.00 Axle to Frame.

TOW HOOK, FRONT (2) Frame Mounted

AXLE CONFIGURATION {Navistar} 6x4
Notes
: Pricing may change if axle configuration is changed.

FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.125" x 3.580" x 0.312" (257.2mm x 90.9mm x 8.0mm); 480.0" (12192) Maximum OAL

FRAME REINFORCEMENT Full Outer C-Channel, Heat Treated Alloy Steel (120,000 PSI Yield), 10.813" x 3.892" x 0.312" (274.6mm x 98.8mm x 7.9mm), 480.0" (12192mm) OAL

BUMPER, FRONT Contoured, Stainless Steel, Polished

CROSSMEMBER, REAR, AF (1)

WHEELBASE RANGE 264" (670cm) Through and Including 311" (790cm)

AXLE, FRONT NON-DRIVING {Meritor MFS-18-133A} Wide Track, I-Beam Type, 18,000-lb Capacity
SUSPENSION, FRONT, SPRING Parabolic Taper Leaf, Shackle Type, 18,000-lb Capacity, with Shock Absorbers

BRAKE SYSTEM, AIR Dual System for Straight Truck Applications
Includes
: BRAKE LINES Color and Size Coded Nylon
: DRAIN VALVE Twist-Type
: GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster
: PARKING BRAKE CONTROL Yellow Knob, Located on Instrument Panel
: PARKING BRAKE VALVE For Truck
: QUICK RELEASE VALVE On Rear Axle for Spring Brake Release: 1 for 4x2, 2 for 6x4
: SLACK ADJUSTERS, FRONT Automatic (with Air Cam Brakes)
: SLACK ADJUSTERS, REAR Automatic (with Air Cam Brakes)
: SPRING BRAKE MODULATOR VALVE R-7 for 4x2, SR-7 with relay valve for 6x4/8x6

BRAKES, FRONT, AIR CAM 16.5" x 6", Includes 24 SqIn Long Stroke Brake Chambers

DRAIN VALVE {Bendix DV-2} Automatic, with Heater, for Air Tank

AIR BRAKE ABS {Bendix AntiLock Brake System} 6-Channel (6 Sensor/6 Modulator) Full Vehicle Wheel Control System

AIR DRYER {Wabco System Saver 1200} with Heater

BRAKE CHAMBERS, REAR AXLE {Bendix EverSure} 30/30 Spring Brake

BRAKE CHAMBERS, FRONT AXLE {Bendix} 24 SqIn

BRAKES, REAR, AIR CAM S-Cam; 16.5" x 7.0"; Includes 30/30 Sq.In. Long Stroke Brake Chamber and Spring Actuated Parking Brake

AIR SUPPLY, AUXILIARY on Air Reservoir with Glad Hand Connector

AIR COMPRESSOR {Cummins} 18.7 CFM

AIR TANK Painted Aluminum, with Straight Thread O-Ring Ports

AIR DRYER LOCATION Mounted Inside Left Rail, Back of Cab

AIR TANK LOCATION (2) Mounted Under Battery Box, Outside Right Rail, Under Cab

BRAKE PACKAGE, FRONT {Bendix Spicer ES-165-6X} Air Cam Type, Extended Service, Size 16.5" x 6",

Includes Automatic Slack Adjusters

BRAKE PACKAGE, REAR {Bendix Spicer ES-165-7X} Air Cam Type, Extended Service, Size 16.5" x 7",
Includes Automatic Slack Adjusters

STEERING COLUMN Tilting and Telescoping

STEERING WHEEL 4-Spoke; 18" Dia., Black

STEERING GEAR (2) {Sheppard M100/M80} Dual Power

DRIVELINE SYSTEM {Dana Spicer} SPL170 Main Driveline with SPL170 Interaxle Shaft, for 6x4

EXHAUST SYSTEM Single, Horizontal Aftertreatment Device, Frame Mounted Under Right Rail Back of Cab, Includes Single Short Horizontal Tail Pipe

ENGINE COMPRESSION BRAKE {Jacobs} for Cummins ISL/L9 Engines; with Selector Switch and On/Off Switch

TAIL PIPE (1) Horizontal, Short, Exits Right Side, 90 Degree Turnout

SWITCH, FOR EXHAUST 3 Position, Momentary, Lighted Momentary, ON/CANCEL, Center Stable, INHIBIT REGEN, Mounted in IP Inhibits Diesel Particulate Filter Regeneration When Switch is Moved to ON While Engine is Running, Resets When Ignition is Turned OFF

ELECTRICAL SYSTEM 12-Volt, Standard Equipment
Includes
: DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab
: HAZARD SWITCH Push On/Push Off, Located on Instrument Panel to Right of Steering Wheel
: HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever
: PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light
: STARTER SWITCH Electric, Key Operated
: STOP, TURN, TAIL & B/U LIGHTS Dual, Rear, Combination with Reflector
: TURN SIGNAL SWITCH Self-Cancelling for Trucks, Manual Cancelling for Tractors, with Lane Change Feature
: WINDSHIELD WIPER SWITCH 2-Speed with Wash and Intermittent Feature (5 Pre-Set Delays), Integral with Turn Signal Lever
: WINDSHIELD WIPERS Single Motor, Electric, Cowl Mounted
: WIRING, CHASSIS Color Coded and Continuously Numbered

IGNITION SWITCH Keyless

BATTERY TERMINALS Sealed

ALTERNATOR {Leece-Neville BLP4006HN} Brushless, 12 Volt 325 Amp. Capacity, Pad Mount, with Remote Sense

BODY BUILDER WIRING Back of Day Cab at Left Frame or Under Sleeper, Extended or Crew Cab at Left Frame; Includes Sealed Connectors for Tail/Amber Turn/Marker/ Backup/Accessory Power/Ground and Sealed Connector for Stop/Turn

BATTERY SYSTEM {Fleetrite} Maintenance-Free, (3) 12-Volt 2850CCA Total, Top Threaded Stud

SPEAKERS (2) 6.5" Dual Cone Mounted in Both Doors, (2) 5.25" Dual Cone Mounted in Both B-Pillars

CB RADIO Accommodation Package; Header Mounted; Feeds From Accessory Side of Ignition Switch; Includes Power Source and One (1) Antenna, Antenna Base with Wiring on Left Side Mirror

RADIO AM/FM/WB/Clock/Bluetooth/USB Input/Auxiliary Input

BATTERY BOX Aluminum, with Plastic Cover, 30" Wide, 2-4 Battery Capacity, Mounted Right Side Under Cab

HORN, ELECTRIC Disc Style

JUMP START STUD Remote Mounted

HORN, AIR ACCOMMODATION PACKAGE; Less Horn

RUNNING LIGHT (2) Daytime

CLEARANCE/MARKER LIGHTS (5) {Truck Lite} Amber LED Lights, Flush Mounted on Cab or Sunshade

STARTING MOTOR {Delco Remy 39MT} 12 Volt, Gear Reduced, with Thermal Over-Crank Protection

INDICATOR, LOW COOLANT LEVEL with Audible Alarm

INDICATOR, BATTERY WARNING Green BATTERY ON Indicator, Mounted on Left Side of Instrument Panel, To be Used with Factory Installed or Customer Mounted Battery Disconnect Switch

CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III with Trip Indicators, Replaces All Fuses

SWITCH, AUXILIARY Switch 40 amp Circuit for Customer Use; Includes Wiring Connection at Power Distribution Center (PDC) and Control in Cab

TURN SIGNALS, FRONT Includes LED Side Turn Lights Mounted on Fender

POWER SOURCE, ADDITIONAL Auxiliary Power Outlet (APO) & USB Port, Located in the Instrument Panel

SWITCH, AIR HORN, PASSENGER Fire Truck Application; Momentary Switch Located in Instrument Panel Close to Passenger, Driver Also To Activate Switch with Lanyard

LOGOS EXTERIOR Model Badges

LOGOS EXTERIOR, ENGINE Badges

INSULATION, UNDER HOOD for Sound Abatement

GRILLE Stationary, Painted Grille & Headlight Bezels 8752 Charcoal Metallic

INSULATION, SPLASH PANELS for Sound Abatement

FRONT END Tilting, Fiberglass, with Three Piece Construction, for WorkStar/HV

GRILLE EMBER SCREEN Mounted to Grille and Cowl Tray to Keep Hot Embers out of Engine and HVAC Air Intake System

CHASSIS COATING Corrosion Resistant E-Coat Primer Coating for Reinforced Frame Rails

PAINT SCHEMATIC, PT-1 Two Tone, Design 209

PAINT IDENTITY, PT-2 Single Color, Instruction No. 932. Wheels

PAINT TYPE Base Coat/Clear Coat, 1-2 Tone

PAINT CLASS Single Custom Color

KEYS - ALL ALIKE, ADDITIONAL 2 Keys

CLUTCH Omit Item (Clutch & Control)

ANTI-FREEZE Red, Extended Life Coolant; To -40 Degrees F/ -40 Degrees C, Freeze Protection

BLOCK HEATER, ENGINE 120V/1000W, for Cummins ISB/B6.7/ISL/L9 Engines
Includes
: BLOCK HEATER SOCKET Receptacle Type; Mounted below Drivers Door

ENGINE, DIESEL {Cummins L9 380} EPA 2017, 380HP @ 2000 RPM, 1150 lb-ft Torque @ 1400 RPM, 2200 RPM Governed Speed, 380 Peak HP (Max), (RATED FOR EMERGENCY VEHICLES ONLY)

FAN DRIVE {Horton Drivemaster} Direct Drive Type, Two Speed with Residual Torque Device for Disengaged Fan Speed Includes

: FAN Nylon

RADIATOR Cross Flow, Series System; 1228 SqIn Aluminum Radiator Core with Internal Water to Oil Transmission Cooler and 1167 In Charge Air Cooler
Includes
: DEAERATION SYSTEM with Surge Tank
: HOSE CLAMPS, RADIATOR HOSES Gates Shrink Band Type; Thermoplastic Coolant Hose Clamps
: RADIATOR HOSES Premium, Rubber

AIR CLEANER Single Element

FEDERAL EMISSIONS {Cummins L9} EPA, OBD and GHG Certified for Calendar Year 2020

THROTTLE, HAND CONTROL Engine Speed Control; Electronic, Stationary, Variable Speed; Mounted on Steering Wheel

FAN OVERRIDE Manual; with Electric Switch on Instrument Panel, (Fan On with Switch On)

EMISSION COMPLIANCE Federal, Does Not Comply with California Clean Air Idle Regulations

ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls; with Ignition Switch Control for Cummins ISB/B6.7 or ISL/L9 Engines

TRANSMISSION, AUTOMATIC {Allison 3000 EVS} 5th Generation Controls, Close Ratio, 6-Speed with Double Overdrive, with PTO Provision, Less Retarder, Includes Oil Level Sensor

TRANSMISSION SHIFT CONTROL Column Mounted Stalk Shifter

TRANSMISSION OIL Synthetic; 29 thru 42 Pints

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Rescue, Ambulance

NEUTRAL AT STOP OMIT

SHIFT CONTROL PARAMETERS {Allison} 3000 or 4000 Series Transmissions, Performance Programming

PTO LOCATION Customer Intends to Install PTO at Left Side of Transmission

AXLE, REAR, TANDEM {Meritor MT-40-14X-5DCR-P} Single Reduction, 40,000-lb Capacity, with Lube Oil Pump, w/.5"(12.7mm) Wall Housing Thickness, Driver Controlled Locking Differential in Forward-Rear and Rear-Rear Axle, R Wheel Ends . Gear Ratio: 5.29

SUSPENSION, REAR, AIR, TANDEM {Hendrickson HAS-460-55} 46,000-lb Capacity, 55" Axle Spacing, 9.5" Ride Height, with Shock Absorbers, Mounted Inboard

SUSPENSION LEVELING VALVE Dual Height; One Additional, for Air Ride Suspension

DIFF. SWITCH CONTROLS Two Independent Switches for Control Traction Differentials on Tandem Rear Axles, Mounted on Dash

DEF TANK 9.5 US Gal (36L) Capacity, Frame Mounted Outside Left Rail, Under Cab

FUEL/WATER SEPARATOR {Racor 400 Series,} 12 VDC Electric Heater, Includes Pre-Heater, with Primer Pump, Includes Water-in-Fuel Sensor

LOCATION FUEL/WATER SEPARATOR Mounted Outside Left Rail, 34" Back of Cab

FUEL TANK Top Draw, Non-Polished Aluminum, 26" Dia, 70 US Gal (265L), Mounted Left Side, Under Cab

AUXILIARY FUEL DRAW TUBE Located at Auxiliary Port on Fuel Tank

CAB Conventional, Day Cab

AIR CONDITIONER with Integral Heater and Defroster

GAUGE CLUSTER Base Level; Metric with Metric Speedometer and Tachometer, for Air Brake Chassis, Includes Engine Coolant Temperature, Primary and Secondary Air Pressure, Fuel and DEF Gauges, Oil Pressure Gauge, Includes 3 Inch Monochromatic Text Display

SEATBELT WARNING PREWIRE Includes Seat Belt Switches and Seat Sensors for all Belted Positions in the Cab and a Harness Routed to the Center of the Dash for the Aftermarket Installation of the Data Recorder and Seatbelt Indicator Systems, for 1 to 3 Seat Belts

GAUGE, OIL TEMP, AUTO TRANS for Allison Transmission

GAUGE, AIR CLEANER RESTRICTION {Filter-Minder} with Black Bezel, Mounted in Instrument Panel

IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster

GAUGE, VOLTMETER Auxiliary Gauge, Located in Center Panel. Standard Cluster Also Includes Digital Voltage Readout

SEAT, DRIVER {Seats, Inc. 911 Universal Series} NFPA Compliant, Air Suspension, High Back Vinyl with Covered Back and International Logo on Head Rest

SEAT, PASSENGER {Seats, Inc. Universal Series} NFPA Compliant, Air Suspension, High Back, Vinyl with Covered Back and International Logo on Headrest for Fire Truck

GRAB HANDLE, EXTERIOR (2) Black, Aluminum, for Cab Entry Mounted Left and Right Side at B-Pillar

MIRRORS (2) Aero Pedestal, Power Adjust, Heated, Black Heads and Arms, 6.5" x 14" Flat Glass, Includes 6.5" x 6" Convex Mirrors, for 102" Load Width
Notes
: Mirror Dimensions are Rounded to the Nearest 0.5"

MIRROR, CONVEX, LOOK DOWN Right Side, Black, 6" x 10.5"

SEAT BELT All Red; 1 to 3

CAB INTERIOR TRIM Classic, for Day Cab
Includes
: CONSOLE, OVERHEAD Molded Plastic with Dual Storage Pockets, Retainer Nets and CB Radio Pocket; Located Above Driver and Passenger
: DOME LIGHT, CAB Door Activated and Push On-Off at Light Lens, Timed Theater Dimming, Integral to Overhead Console, Center Mounted
: SUN VISOR (2) Padded Vinyl; 2 Moveable (Front-to-Side) Primary Visors, Driver Side with Toll Ticket Strap

WINDSHIELD Heated, Single Piece

CAB SOUND INSULATION Includes Dash Insulator and Engine Cover Insulator

WINDOW, POWER (2) and Power Door Locks, Left and Right Doors, Includes Express Down Feature

CAB REAR SUSPENSION Air Bag Type

INSTRUMENT PANEL Wing Panel

SUNSHADE, EXTERIOR Aerodynamic, Painted Roof Color, with Integral Clearance/Marker Lights

WINDSHIELD WIPER BLADES Snow Type

ACCESS, CAB Steel, Driver & Passenger Sides, Two Steps per Door, for use with Day Cab and Extended Cab

WHEELS, FRONT {Accuride 29807} DISC; 22.5x12.25 Rims, Powder Coat Steel, 5-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs, Offset 5.37"

WHEELS, REAR {Accuride 29169} DUAL DISC; 22.5x8.25 Rims, Powder Coat Steel, 5-Hand Hole, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with .472" Thick Increased Capacity Disc and Steel Hubs

(8) TIRE, REAR 11R22.5 Load Range H XDN2 (MICHELIN), 497 rev/mile, 75 MPH, Drive

(2) TIRE, FRONT 385/65R22.5 Load Range J XZY-3 (MICHELIN), 491 rev/mile, 65 MPH, All-Position

Services Section:
WARRANTY Standard for HV507, HV50B, HV607 Models, Effective with Vehicles Built July 1, 2017 or Later, CTS-2025A

Total Component Weight: 8,908 / 8,376 17,284

The weight calculations included in this proposal are an estimate of future vehicle weight. The actual weight as manufactured may be different from the estimated weight. Navistar, Inc. shall not be liable for any consequences resulting from any differences between the estimated weight of a vehicle and the actual weight.

CAB TO AXLE DIMENSION

Cab to axle will be 244”.

CHASSIS MODIFICATIONS

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

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

OVERALL HEIGHT, LENGTH DATA PLATE (METRIC)

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 meters (to nearest 1/10th), the length of the completed fire apparatus in meters (to nearest 1/10th), and the GVWR in metric tons.

Wording on the label in both English and French shall indicate that; "The information shown was current when the apparatus was manufactured. If the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate",

"Cette information montrée était actuelle au moment de la fabrication de l'appareil. Si la hauteur totale change pendant que le véhicule est en service, le service d'incendie doit revoir cette dimension sur la plaque".

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.

SEAT BELT WARNING - FAMA06/07

A safety sign FAMA06 shall be visible from each seat that is not equipped with occupant restraint and therefore not intended to be occupied while the vehicle is in motion.

A safety sign FAMA07, which warns of the importance of seat belt use in both English and French, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

“Occupants must be seated and belted when apparatus is in motion."

"Les occupants doivent etre assis et leur ceinture doit etre attachee lorsque l'engin est en mouvement".

EQUIPMENT MOUNTING FAMA10

A safety sign FAMA10, which warns of the need to secure items in the cab, shall be visible inside the cab.

FIRE SERVICE TIRES - FAMA12

A safety sign FAMA12, which warns of the special requirements for fire service–rated tires, shall be visible to the driver entering the cab of any apparatus so equipped.

HELMET WARNING - FAMA15

A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion in both English and French, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.
From each seating location a label stating

“Do not wear helmet while seated.”

"Ne portez pas votre casque lorsque vous etes assis."

CLIMBING METHOD - FAMA23

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

Fall Hazard.
When climbing on or off vehicle, ALWAYS:

- Face vehicle.
- Use steps and handholds. Maintain three points of contact with vehicle (two feet and one hand or two hands and one foot).
- Keep steps, handholds, and walkways clean

Use extra caution when wet, icy or muddy.
Replace surfaces when worn.
Slips and falls can injure or kill.

Risque de chute.
En montant ou en descendant d'un véhicule, TOUJOURS:

- *Véhicule face*
- *Utilisez les étapes et les poignées. Maintenir trois points de contact avec le véhicule (deux pieds et une main ou deux mains et un pied).*
- *Gardez les marches, les poignées et les allées propres*

Faites preuve de prudence lorsque vous êtes mouillé, glacé ou boueux.
Remplacez les surfaces portées.
Les glissades et les chutes peuvent blesser ou tuer.

STEPS CROSSWALK WARNING - FAMA24

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

"Fall Hazard. Never ride on vehicle when it is in motion. Fall from moving vehicle may injure or kill".

"Risque de chute. Ne roulez jamais sur un véhicule lorsqu'il est en mouvement. Une chute de véhicule en mouvement peut causer des blessures ou la mort".

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

A final stage manufacturer vehicle certification label shall be provided and installed in the driver cab door jamb area.

FRONT BUMPER

The front bumper shall be as provided by the cab/chassis manufacturer. No other alteration or modifications are required to extension length.

BUMPER GRAVELSHIELD

The bumper extension gravel shield shall be provided by the cab/chassis manufacturer.

BUMPER GRAVELSHIELD

The bumper extension gravel shield shall be provided by the cab/chassis manufacturer.

AIR HORNS

Two (2) Grover 24" Stuttertone chrome plated air horns shall be mounted, one (1) each side of the cab hood. An emergency air shut off valve shall be provided in cab.

AIR HORN ACTIVATION

The air horn(s) shall be operated by a foot switch on the cab floor located at both the driver and officer positions.

FRONT TOW PROVISIONS

The front tow provisions shall be supplied and installed by the cab/chassis manufacturer.

AIR INTAKE SYSTEM

An air filter shall be provided in the engine’s air intake system by the body builder. Air inlet restrictions shall not exceed the engine manufacturer’s recommendations.

The air inlet shall be equipped with a means of separating water and burning embers from the air intake system.

This requirement shall be permitted to be achieved by either of the following methods:

1. Provision of a device such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.

2. Provision of a multi screen ember separator capable of meeting the test requirements defined in the Parker Hannafin, Racor Division, publication LF 1093-90, *Ember Separation Test Procedure*, or an equivalent test.

AIR RESTRICTION INDICATOR

An air restriction indicator shall be re-mounted, or provided in the driving compartment and visible to the driver.

EXHAUST

The exhaust system shall be as provided by cab/chassis manufacturer. The tailpipe may require some modifications for proper ground clearances and fit with body.

The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the vehicle or equipment to excessive heating.

Exhaust pipe discharge shall be directed away from any operator’s position or entry doors on body.

Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided.

EXHAUST DIVERTER

An exhaust diverter valve shall be located in-line of exhaust tubing and controlled from driver's position to re-route exhaust discharge. Exhaust diverter valve shall be constructed from 14 gauge stainless steel material with air actuated control.

As a default, the exhaust shall always discharge to curbside just ahead of rear wheels, and when selected the exhaust shall discharge to a vertical exhaust pipe, extending above the body height 12".

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.

- Exhaust Diverter shall actuate automatically when the Park Brake is applied.

PLYMOVENT EXHAUST ADAPTER

A Plymovent 5" exhaust adapter flange for Plymovent pneumatic systems shall be provided and installed on the chassis engine exhaust tailpipe.
NOTE: There shall be 2.5" clear to body, and 4" set back on stop.

RELOCATE CHASSIS SUPPLIED BATTERIES

The cab/chassis supplied batteries shall be relocated to forward streetside compartment on slide-out tray. If battery storage boxes are provided with cab/chassis they will be removed and holes in frame filled with appropriate sized bolts and nuts.

The battery compartment shall have additional vents for proper ventilation. Batteries shall be mounted on black DriDek plastic matting material with a heavy duty clamp device. 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. The cables shall be shielded from exhaust and mufflers. Large rubber grommets shall be used where cable enters battery compartment.

RADIO/ANTENNA INSTALLATION

There shall be one (1) radio(s) face plate with antenna installed in the cab within easy reach of driver. The location of face plate shall be in the console accessible for the driver and officer, leaving the antenna router to the console.

SCBA SEAT AIR PACK BRACKETS

No SCBA air pack bracket(s) shall be provided in specified commercial cab SCBA seats. Winnipeg Fire Paramedic Service will provide and install necessary bracket(s) after delivery.

SEAT BELT COLOR

Section 14.1.3.4 of the NFPA 1901 Standards, 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.

SEAT BELT WEB LENGTH - COMMERCIAL CAB

Sections 14.1.3.2 and 14.1.3.3 of the NFPA 1901 standards, 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 commercial chassis manufacturer shall be compliant to NFPA Standards 14.1.3.2 and 14.1.3.3.

SEAT BELT MONITORING AND VEHICLE DATA RECORDER (VDR) SYSTEMS

SEAT BELT MONITORING

A Weldon 6204 series system with Vista IV display shall be provided and installed to allow the driver to know if all persons seated in the vehicle are secured with seat belts before moving the vehicle. Built-in smart seating logic shall detect if the correct sit and buckle sequence is not followed for all seats. System shall also provide an output for an external alarm. Weldon diagnostic port will be located under dash on driver side. System shall include the following features;

VEHICLE DATA RECORDER (VDR)

The vehicle data recorder shall have the following features;

- Recorded Data Includes: Vehicle Speed, Acceleration, Deceleration, Engine Speed, Engine Throttle Position, ABS Event, Seat Occupied Status, Seat Belt Status, Master Optical Warning Switch, Park Brake, Service Brake, Time, Date and Engine Hours.
- Password Protected by the customer
- Six (6) seat position inputs for occupied and belts buckled. Additional six (6) seat expansion module available.
- Easily interfaces with V-MUX™ or other multiplexing systems

- Data is extracted by a standard, mini USB cable

OCCUPANT RESTRAINT INDICATOR

The occupant restraint indicator shall have the following features;

- Will be displayed on Vista IV panel.
- Supports commercial and custom cab seating layouts; up to 12 seats
- Built-in audible alarm
- Use in conjunction with Vehicle Data Recorder (VDR)

IGNITION KEY

If the vehicle is specified to have an ignition key it will be attached to steering column or dash with vinyl covered steel cable.

TEN (10) – LED TIRE PRESSURE VISUAL INDICATORS

Each tire valve stem shall be equipped with an LED Tire Alert (or equal), heavy duty valve cap LED indicator that indicates proper tire pressure. The LED Tire Alert valve cap is self-calibrating. When the cap is mounted on the valve stem the first time, it will memorize that tire pressure, and can be set to recognize a drop in pressure as little as 6 psi. It can be checked for functionality and battery condition by simply unscrewing the cap. If it is in working condition, it will immediately start blinking.

HELMET STORAGE

No helmet storage is required in the cab driving area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

HELMET STORAGE

No helmet storage is required in the cab crew area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

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.

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.

CAB PAINT

The finish paint and color as provided from the cab/chassis manufacturer shall be provided. Cab shall not be repainted.

(Note: Most departments do NOT find that the fleet paint finish from a commercial cab/chassis manufacturer is acceptable. The Body Builder will NOT be responsible for paint quality and finish issues.)

HUB AND NUT COVERS

Front and rear wheels shall be provided with stainless steel hub caps and wheel nut covers.

MUDFLAPS

There shall be 1/4" rubber mudflaps without logo provided and installed behind each set of tires to prevent throwing road debris and lower road spray.

AIR BRAKE SYSTEM QUICK BUILD-UP - STYLE 'M' / INDUSTRIAL INLET CONNECTION

There shall be one (1) male, quick connect type inlet to provide air to the chassis air tanks from a station/external compressed air shoreline in order to maintain full operating air pressure while the vehicle is not running. The system shall include a one-way check valve to prevent accidental release of chassis air pressure and be labeled "AIR INLET".

- Air inlet shall be located near driver's door.
- The fitting will be of style 'M' / Industrial design.

The inlet shall eliminate the need for a quick build up system and the 60 second buildup time.

The female end of the connector shall be supplied by the Winnipeg Fire Paramedic Service.

AIR BRAKE SYSTEM QUICK BUILD-UP

The air brake quick build-up system shall be supplied from the specified automatic electric compressor in order to maintain full operating air pressure while the vehicle is not running.

The quick buildup system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time.

CHASSIS ENGINE COOLING SYSTEM DRAIN VALVES

Readily accessible drain valves shall be installed at the lowest point of the cooling system and at such other points as are necessary to permit complete removal of the coolant from the system.

Drain valves shall be designed or positioned such that they will not open accidentally.

ROAD EMERGENCY SAFETY KIT

The completed unit shall be supplied with one (1) set of three (3) dual faced reflective triangles, and three (3) warning flares complete with storage case per DOT requirements.

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket per DOT requirements shall be provided and mounted inside cab area.

AUTOMATIC VEHICLE LEVELING SYSTEM

A Quadra Manufacturing, Inc. "Big Foot" model QEIIAM-26 shall be provided and installed on the completed vehicle designed for large heavy duty vehicles. The system shall have the following features;

- Simple, one touch operation for fully automatic leveling of the vehicle or trailer.
- Individual power units at each corner, which means nearly 4x the pump life compared to ordinary central pump systems due to each pump only running 25% of the time, less cycles = less wear & tear.
- All-Up safety feature signals if one or more of the cylinders are not fully retracted before you drive off.
- Manual adjustment feature that allows you to operate each cylinder individually.
- Four powder coated cylinders made at our facility capable of lifting 17,000 pounds each with 18” of stroke.
- Four weatherproof hydraulic power units, each with an American made marine pump & motor wrapped in a steel housing, allows the unit to be mounted outside in the elements so it does not take up storage space.
- 100 square inch "Bigfoot" pads for secure ground contact during operation.
- Emergency Retract operation.

The system shall be provided with Lifetime Cylinders, 2 Years Parts, 1 Year Labor limited warranty from Quadra Manufacturing, Inc.

SUPPORT PADS

Four (4) Super Dolly (or equal) 15" x 17" x 1" support pads for use with vehicle leveling system shall be provided infront of rear axle compartments (S3/C3 two (2) each on each side.)

DEF FLUID FILL

The DEF fluid fill shall be as supplied by commercial cab/chassis manufacturer.

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. All Bidders shall be required to meet these minimum requirements.

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. Since such materials are available to all Manufacturers, the material specifications shall be strictly adhered to.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the Winnipeg Fire Paramedic Service 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 Winnipeg Fire Paramedic Service from such repair and shall NOT be used. All fabricated body components to be cut by a laser or water-jet for superior cut edge quality.

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.

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. One-way rubber drain valves shall be provided in compartment floors so that a water hose may be used to flush-out compartment area.

All exterior seams in sheet metal below frame, and around the rear wheel well area shall be welded and caulked to prevent moisture from entering the 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.

ROOF CONSTRUCTION

The roof structure shall be integral with the body sheet metal construction and shall be an all welded assembly. The body roof structure shall be overlaid with not less than 3/16" aluminum 3003H-14 alloy NFPA compliant non-skid tread plate and welded to roof structure and body sheet metal. All seams in roof material shall be fully and continuously welded to prevent entry of moisture.

There shall be a total of four (4) 2" x 2" x 1/4" 6061-T6 alloy aluminum "C" channels running the length of body, two (2) on each outboard side. These "C" channels shall be used for roof support and in addition shall be used for mounting of any specified reels. This open "C" channel design along with special reel mounting clips allows for a universal location of any specified reels within each compartment.

In between the two (2) center "C" channels running the length of body shall be 2" x 2" x 1/4" 6061-T6 alloy aluminum tubing running in between and welded in place on approximate 16" centers to support roof and/or walkway structure if specified.

A 2" formed radius shall be provided along the body sides and utilized as a wiring trough. The use of aluminum extrusions in this area shall not be acceptable, .

BODY SUBFRAME

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 cross members of 2" x 6" x 1/4" aluminum. These cross members shall extend the full width of the body to support the compartments. Cross members 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 cross members shall be located on 16" centers, or 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.

BODY MOUNTING

The body subframe shall be fastened to the chassis frame with a minimum of eight (8) 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 utilizing 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.

18" 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 18" and provide a rear step with a minimum of 1/2" space at body for water drainage.

REAR TOW EYES

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the body subframe, below body. The tow eyes shall be fabricated from 3/4" thick steel plate with a 3" diameter opening. Tow eyes shall have a black powder coat finish.

GROUND LIGHTS

There shall be two (2) OnScene 8" Access white LED lights installed below bumper 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 shall be switchable but activated automatically when the vehicle park brake is set.

WHEEL WELL EXTERIOR PANEL

The exterior panel of the body wheel well enclosure shall be constructed from 3/16" smooth aluminum panels.

RUBBER BODY FENDERS

The body wheel well openings shall be provided with round radius, rubber fenderettes. The fenderettes shall be bolted and easily replaceable if damaged. The fenderettes shall be installed using stainless steel fasteners with plastic isolators to help prevent corrosion.

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.

BODY PAINT SPECIFICATIONS

BODY PAINT PREPARATION

After the body and components have been fabricated they shall be disassembled so when vehicle is complete there shall be finish paint beneath the removable components. The body shall be removed from chassis during the paint process to insure proper paint coverage. The body and components shall be metal finished as follows to provide a superior substrate for painting.

The exterior (and interior, if painted) body shall undergo a thorough cleaning process starting with a biodegradable phosphoric acid solution to begin the etching process followed by a complete clear water rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the metal surface for greater film adhesion.

All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be chrome plated. Iron fittings shall be copper under plated prior to chrome plating.

PAINT PROCESS

The paint process shall follow the strict standards set forth by PPG Industries guidelines. Painters applying PPG products will be PPG Certified Commercial Technicians, and re-certified every two (2) years. The body shall go through the following paint process;

1) Clean bare metal with a wax and grease remover using low lint rags.
2) Inspect, straighten, and hammer high points, grind all seams, sharp edges, and welds. DA sand entire paintable surfaces using 24-180 grit dry paper. Plastic fill all low spots and DA sand fill areas using 36-180 grit dry paper. Apply pinhole filler and DA sand areas using 80-180 grit dry paper.
3) Re-clean bare metal using a wax and grease remover and low lint rags.
4) Within 24 hours, a PPG Delfleet® epoxy color primer with proper hardener for corrosion resistance using a pressure pot spray gun and applying 2-5 full wet coats or 1.5-8.0 dry mils max. achieving full hiding and allow to air dry 60 minutes @ 70°F or bake for 45 minutes @ 140°F degree.
5) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
6) Re-clean bare metal using a wax and grease remover using low lint rags.
7) A PPG Delfleet® primer sealer with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 1 full wet coat or 1.0-2.0 dry mils achieving full hiding and allow to flash off in spray booth for minimum of 60 minutes @ 70°F.
8) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive shall then be sprayed using a pressure pot set @ 45-60 PSI and achieving full hiding or 1.5-2.0 wet mils and allow to flash off in spray booth 45-60 minutes before applying clearcoat.
9) A PPG Delfleet® clearcoat with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 2-3 full wet coats or 5.0 wet mils for a uniform gloss and allow to flash off in spray booth 10 minutes and bake for 120-140 minutes @ 125°F (surface temp.).
10) After cooling, DA sand heavy orange peel or runs using 1000 grit dry sand paper and final DA sand using 1500-2000 grit dry sand paper. Wipe off all surfaces to remove dust and debris. Buff unit as needed using 3M rubbing compound and a white wool pad and inspect until all sand scratches are removed.
11) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

PAINT - ENVIRONMENTAL IMPACT

The contractor shall meet or exceed all current State (his) regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. PPG Delfleet® Evolution paint shall be free of all heavy metal (lead & chromate) components. Paint emissions from sanding and painting shall be filtered and collected. All paint wastes shall be disposed of in an environmentally safe manner. Solvents used in cleanup operations shall be collected, sent off-site for distillation and returned for reuse.

FASTENERS

Prior to the assembly and reinstallation of exterior components; i.e. warning and DOT lights, handrails, steps, door hardware, and miscellaneous items, a Mylar isolation tape, or gasket shall be used to prevent damage to the finish painted surface. These components shall be fastened to body using either a plastic insert into body metal with stainless steel screws or zinc coated nut-surts into body surface using stainless steel bolts to prevent corrosion from dissimilar metals.

ELECTROLYSIS CORROSION CONTROL

The vehicle shall be assembled using ECK brand or similar corrosion control compound on all high corrosion potential areas.

ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals and gives bedding protection for hardware and fasteners. ECK contains anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.

PAINT FINISH - SINGLE COLOR

The body shall be painted with a single color of PPG Delfleet® Evolution per Winnipeg Fire Paramedic Service approved paint spray out provided.

A small touch-up bottle of paint shall be provided with completed vehicle.

- Paint Color: Match cab/chassis supplied paint color, Red 911662

BODY UNDERCOATING

The entire underside of body shall be sprayed with black automotive undercoating. Undercoating shall cover all areas underside of body and wheel well area to help prevent corrosion under the vehicle.

UNDERCOAT WARRANTY

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material 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.

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. **Pro-rated warranties will not be acceptable.**

COMPARTMENT INTERIOR FINISH

The compartment interior paintable surfaces shall be prepared and DA sanded using 80-120 grit dry paper and cleaned with a wax and grease remover. A PPG Delfleet® primer topcoat of either a solids epoxy primer or an etch primer shall be applied.

A PPG Delfleet® color primer with proper hardener and thinner mix shall then be sprayed using a pressure pot spray gun and applying 2 wet coats achieving full hiding on entire compartment surface and allow to air dry for 30 minutes @ 70°F before applying texture coat.

A PPG Delfleet® F3985 White/F3986 Gray top coat/texture coat with proper hardener and dry additive shall then be sprayed using a pressure pot and reducing the atomizing air pressure and turn fan pattern all the way in on the gun. Apply the first color texture coat as needed and allow to air dry @ 70°F over night before assembly and 7 days before putting into full service.

REFLECTIVE STRIPE REQUIREMENTS

Material

All retroreflective materials shall conform to the requirements of ASTM D4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D4956, Section 6.1.1, shall have a minimum coefficient of retro-reflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D4956, Section 6.1.1.

Minimum Requirements

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the vehicle, not including mirrors or other protrusions.

The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

A graphic design shall be permitted to replace all or part of the required striping material if the design or combination thereof covers at least the same perimeter length(s).

GRAPHICS PROOF

A color graphics proof of the reflective striping layout shall be provided for approval by Winnipeg Fire Paramedic Service prior to installation. The graphics proof shall be submitted to Winnipeg Fire Paramedic Service on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

CHEVRON STRIPE - CAB BUMPER

A reflective stripe shall be affixed to the front of cab. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The approximate 10" wide Chevron retroreflective stripe shall be affixed to at least 25 percent of the width of the front of the apparatus with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

- The stripe material shall be 3M Scotchlite Diamond Grade.

All retroreflective materials required shall conform to the requirements of ASTM D 4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS

At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width.

The rear side panels of the body on each side of a rear stairway or compartment shall have a chevron style reflective stripe, extending from bumper height up to side compartment drip rail height. Each chevron panel shall be a full sheet and shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panel shall have a minimum 10 year warranty for material failure, and colorfastness.

The stripe material shall be 3M Diamond Grade.

This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

LETTERING

GRAPHICS PROOF

A color graphics proof of the lettering layout shall be provided for approval by Winnipeg Fire Paramedic Service prior to installation. The graphics proof shall be submitted to Winnipeg Fire Paramedic Service on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

The following lettering shall be provided and installed on the completed unit as follows;

SIDE CAB DOOR LETTERING

UPPER BODY SIDE LETTERING

REAR BODY LETTERING

FRONT OF CAB LETTERING

CAB ROOF LETTERING

EXTERIOR COMPARTMENT DOORS

FLUSH FITTING HINGED DOOR CONSTRUCTION

The exterior compartment doors shall be a flush style, 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.

Each door shall be capable of being opened or 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.

Vertically hinged door openings up to 32" wide shall be single door construction. Door openings over 32" shall be double door construction with the forward first opening door overlapping the second opening door.

BODY HEIGHT MEASUREMENTS

The vertical body dimensions shall be as follows:

AHEAD OF REAR AXLE

	Description	Dimension
A	Bottom of Subframe to Top of Body	102.7"
B	Bottom of Subframe to Bottom of Body	22.5"
C	Total Body Height	125.2"
D	Compartment Height Below Frame	28.0"
E	Vertical Door Opening (Below Frame Compartment): -with hinged door	25.4"

BEHIND REAR AXLE

	Description	Dimension
F	Bottom of Subframe to Bottom of Body	20.0"
G	Compartment Height Below Frame	22.5"
H	Vertical Door Opening - (Below Frame Compartment):	
I	-with hinged door	21.4"

GENERAL

	Description	Dimension
J	Walk-in Interior Height	83.0" (min.)

(Dimensions are general and subject to change during the actual design process)

BODY WIDTH DIMENSIONS

The body shall be 100.0" wide, and 102.0" wide at drip rails. Interior compartment depth dimensions shall be approximately:

Area Description	Dimension
Transverse above subframe	95.0"

Compartment depth below subframe 24.5"

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment width shall be approximately 59.5" wide.

The compartment door opening shall be approximately 52.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be one (1) 400 lbs. slide-out tray(s) approximately 16" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
  - The above component(s) shall have a smooth un-painted finish.
  - 3M™ Diamond Grade™ striping shall be provided on the front and side faces of the tray. The stripe shall alternate red and fluorescent yellow-green in color.

  ALL tray stripes will be chevron pattern.
- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.
- The controls for the specified light tower(s).
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.
- The 12 volt electrical distribution panel shall be located in the front lower compartment.

STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

The interior useable compartment width shall be approximately 59.5" wide.

The compartment door opening shall be approximately 52.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There shall be one (1) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

  - The above component(s) shall have a smooth un-painted finish.

  - 3M™ Diamond Grade™ striping shall be provided on the front faces of shelf(s). The stripe shall alternate red and fluorescent yellow-green in color.

- There shall be one (1) bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.

  - The above component(s) shall have a smooth un-painted finish.

- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.

STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S3)

The interior useable compartment width shall be approximately 59.5" wide.

The compartment door opening shall be approximately 52.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There shall be one (1) adjustable shelf/shelves approximately 24" deep located on right side of vertical partition. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

  - The above component(s) shall have a smooth un-painted finish.

  - 3M™ Diamond Grade™ striping shall be provided on the front faces of shelf(s). The stripe shall alternate red and fluorescent yellow-green in color.

- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.

- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.

  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).

  - Outlet(s) shall be powered through the on-board generator system.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

STREETSIDE COMPARTMENT - BEHIND REAR WHEEL LOWER (S4)

This Compartment will house the Generator only.

The interior useable compartment space shall be approximately 70.5" wide.

The compartment door opening shall be approximately 61.0" wide.

- This compartment shall have flush fitting vertically hinged compartment door. The door exterior shall be painted job color.

- The interior door panel shall have a smooth un-painted aluminum panel.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

- The hinged door(s) 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 compartment door header and the box pan of the door.

- The door ajar switch shall be provided with specified hinged door and pneumatic cylinder switch assembly to activate compartment lighting and door ajar signal in cab when door is opened.

- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be fabricated from brushed 304 stainless steel sheet metal.

COMPARTMENT LAYOUT

- One (1) OnScene Access white LED, full height compartment light, vertically mounted.

- The diesel engine driven generator location.

- There shall be one (1) underbody slide-out step. Step surface shall be constructed from 9" deep DiamondBack non-slip vented aluminum stair treads mounted to underbody of S4 aft wheel chocks, using Delron plastic slides for corrosion resistance. Step slide shall be securely held in both out and stored position, utilizing a heavy duty pneumatic cylinder designed to have an over center location which will assist the step in both extension and retraction. Each step shall be designed to hold 500 lbs.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

STREETSIDE COMPARTMENT - REAR (S4) UPPER

The interior useable compartment space shall be approximately 70.5" wide.

The compartment door opening shall be approximately 63.2" wide.

- This compartment shall have flush fitting vertically hinged compartment door. The door exterior shall be painted job color.

- The interior door panel shall have a smooth un-painted aluminum panel.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

- The hinged door(s) 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 compartment door header and the box pan of the door.

- The door ajar switch shall be provided with specified hinged door and pneumatic cylinder switch assembly to activate compartment lighting and door ajar signal in cab when door is opened.

- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be fabricated from brushed 304 stainless steel sheet metal.

COMPARTMENT LAYOUT

- There shall be one (1) SCBA cylinder storage module for 7-5/8" OD (maximum) SCBA bottles. The maximum length of the SCBA cylinder shall be 24.75". The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA cylinder storage tubing shall be fabricated from PVC pipe to prevent damage or abrasion to cylinders. In addition there shall be rubber pad provided in the base of each storage tube for bottle protection and to prevent slipping.
  - The SCBA cylinder module shall be capable of storing twelve (12) SCBA cylinders up to 7-5/8" diameter.
- One (1) Hannay ECR1616-17-18 electric cable reel(s) capable of storing 150' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
  - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.
  - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
  - The cable reel shall equipped with 150' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
- One (1) Akron model EJBX series, cast aluminum electrical power distribution box with gray powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;
  - A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration shall include:
  - One (1) 120 VAC, L5-15 dual twist lock receptacles
  - One (1) 120 VAC, L5-15 dual twist lock receptacles
  - One (1) 120 VAC, 5-15 duplex straight-blade receptacle.
  - One (1) 120 VAC, 5-20 GFCI duplex straight-blade receptacle wired to protect all outlets in box.
- One (1) Akron Brass model EJB-VMT aluminum treadplate vertical mounting bracket for specified power distribution box shall be provided and mounted in compartment per Winnipeg Fire Paramedic Service.
- The fairlead roller shall be mounted directly to the reel.
- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered through the on-board generator system.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

CURBSIDE COMPARTMENT - FRONT (C1)

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 40.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 1" vertical front lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

  - The above component(s) shall have a smooth un-painted finish.

  - 3M™ Diamond Grade™ striping shall be provided on the front and side faces of the tray. The stripe shall alternate red and fluorescent yellow-green in color.

- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 40.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 1" vertical front lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

  - The above component(s) shall have a smooth un-painted finish.

  - 3M™ Diamond Grade™ striping shall be provided on the front and side faces of the tray. The stripe shall alternate red and fluorescent yellow-green in color.

- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.

- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.

  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).

  - Outlet(s) shall be powered through the on-board generator system.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

SIDE ENTRY DOOR

Access shall be provided to the interior through a single side entry door with a clear door opening width of approximately 28.5" x minimum 75" high.

Construction of the side entry door shall be with 1/8" aluminum exterior smooth plate and painted exterior body color choice. The interior door pan shall be constructed from 1/8" aluminum treadplate.

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.

Full width padded foam cushion head bumper shall be provided above door opening. The head bumper shall be covered with matching interior vinyl and bolted to interior of door way.

The door latch mechanism shall include a stainless steel paddle type handle on interior. 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 complying with FMVSS requirements.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

- One (1) OnScene 8" Access white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.

ENTRY HANDRAILS

There shall be two (2) handrails provided at entry door; one (1) 24" vertical on exterior of body on door handle side, and one (1) 30" on inside of door. The interior handrail shall be angled for optimum use when entering or exiting the interior body area.

Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

WINDOW(S)

There shall be one (1) 18"wide x 22" high, double-paned insulated, 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.

EXTERIOR COMPARTMENT PULL-OUT ENTRY STEPS

Located below the entry door shall be a compartment for storage of pull-out entry steps for ingress/egress into interior body.

Entry steps shall be enclosed behind a drop-down hinged compartment door. The compartment door 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.

DOOR CONSTRUCTION DETAIL

The flush mounted compartment door 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 door openings shall be sealed with closed cell automotive type rubber molding to provide a weather resistant seal around door. Open cell foam type rubber moldings are NOT ACCEPTABLE.

Compartment door 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.

A drip rail shall be installed above compartment door opening and shall be completely removable for easy replacement if necessary.

The latching mechanism of hinged compartment doors shall include stainless steel 6" 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.

A pair of pneumatic cylinder door checks shall hold door in the open and closed position and capable of being closed without unlatching. Door checks shall be bolted to body and box pan of door. Door checks that require unlatching by hand will NOT BE ACCEPTABLE.

STEP CONSTRUCTION DETAIL

There shall be two (2) fixed steps with 10" minimum tread depth. Steps shall be fabricated from 3/16" thickness 3003H-14 alloy aluminum with NFPA compliant step surface and adequately reinforced to withstand a 350 lb. person standing on step.

There shall be one (1) fold-down step located on the bottom tread surface to reduce the distance from the ground to the first step. This lower step shall manually fold up onto other steps for travel.

The step shall be mounted on an On Scene Solutions slide-out tray frame constructed of anodized aluminum extrusions. 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 distributed load of 1,000 lbs. and a 500 lb. end load.

The drop-down door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C3)

The interior useable compartment width shall be approximately 50.0" wide.

The compartment door opening shall be approximately 43.0" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track to activate compartment lighting and door ajar signal in cab when door is opened.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point 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 LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 1" vertical front lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

  - The above component(s) shall have a smooth un-painted finish.

  - 3M™ Diamond Grade™ striping shall be provided on the front and side faces of the tray. The stripe shall alternate red and fluorescent yellow-green in color.

- One (1) OnScene Access white LED, full width compartment light mounted at the top of the compartment toward the door opening.

- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.

  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).

  - Outlet(s) shall be powered through the on-board generator system.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

CURBSIDE COMPARTMENT - REAR (C4)

The interior useable compartment width shall be approximately 32.0" wide.

The compartment door opening shall be approximately 25.0" wide.

This compartment shall have a R•O•M series IV roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.

- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior door track to activate compartment lighting and door ajar signal in cab when door is opened.

- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.

- The roll-up doors shall be manually operated with a key.

- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.

- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.

- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).

- One (1) OnScene Access white LED, full height compartment light, vertically mounted.

No 12 VDC fuse block(s) are required in this area.

No 12 VDC power stud(s) are required in this area.

- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered through the on-board generator system.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

PLASTIC FLOOR AND SHELF TILE

Dri-Dek 12" x 12" x 9/16", self-draining plastic inter-locking material shall be cut to size and cover all compartment floors, shelves, and trays.

- The plastic floor tile shall be black.

- The plastic edge trim shall be black.

LOWER SIDE BODY PROTECTION - RUB RAIL

OnScene Solutions rub rails shall be 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 {will/shall} be provided in the rub rail. The stripe shall alternate red and fluorescent yellow-green in color.

FRONT GRAVEL GUARDS

Gravel guards shall be provided on front lower body corners. Guards shall be 12" high, extend from behind cab or step and wrap around to the front compartment door opening fabricated from 20 gauge brushed stainless steel.

ACCESS LADDER

The top of the body shall be accessible from the ground by a folding style ladder. The ladder design shall have a main pivoting ladder section with a fixed bolt-on upper hand rail section that extends just above top surface. The lower step section of ladder shall fold-out creating an angled ladder that brings the first step closer to ground for easier step height access and a comfortable climbing angle. The ladder shall fold-up and store in vertical position for better angle of departure.

Each cast aluminum step shall be 4-1/2" deep x 16" wide. Hand railing shall be 2-1/8" oval shaped aluminum tubing with a ribbed gripping surface.

The ladder shall be wired to the door ajar warning light in cab to warn the driver that the ladder is in the down position. Ladder shall be mounted to body with stainless steel bolts.

Ladder shall be located on rear curbside of the body.

WALKWAY/STEP LIGHTS

There shall be two (2) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area.

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

WALK-IN INTERIOR FINISH DETAILS

DESK, CABINET, CONSOLE FINISH

All specified interior desks, cabinets, overhead cabinets, or consoles shall be fabricated from formed 1/8" 3003 H14 alloy smooth aluminum. After fabrication is completed they shall be painted with a hammer tone powder coat paint finish for a hard durable surface. Paint color shall be gray.

The use of wood materials or laminated surfaces in the construction of desks, cabinets, overhead cabinets, or consoles will not be allowed. There will be **No Exceptions** allowed on specified ruggedized finish.

MAGNETIC WHITEBOARD

There shall be two (2) magnetic whiteboard(s), approximately 30" wide x 36" tall located on wall, location per Winnipeg Fire Paramedic Service.

LOCATIONS: one (1) above streetside outboard window.
one (1) curbside front wall.

CAB/BODY PASS THROUGH CONNECTION

The front center of rescue body shall be interconnected with the commercial cab through a flexible weather-tight walk-through connection. The opening shall be approximately 28" wide x 14" -16" Tall, opening through rear window.

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.
Locate aft of front entry door per sales drawing.

INTERIOR BODY WINDOW COVERS

An interior window cover shall be provided on six (6) windows in the apparatus body.

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.

INTERIOR SPECIFICATIONS

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 Dow Thermax, or equal 1-1/2" glass-fiber reinforced polyisocyanurate foam core laminated between 1.0 mil smooth, reflective aluminum foil facers on both sides, with an R9.8 value. The reinforcement, along with chemical modifications, contributes to fire resistance and dimensional stability. 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 is not acceptable.

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 gray plastic plugs covering the screws. The seams between FRP panels, interior corners, and exterior corners shall be trimmed with gray plastic molding.

The interior finish shall be pearl gray pebble grain FRP.

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.

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.

UNDERFLOOR INSULATION

The under floor area between the frame rails shall have 3" foam insulation applied from the underside of the body.

AIR CONDITIONER - HEATER

Three (3) Dometic Penguin II low profile, 120 VAC, 60 cycle, single phase air conditioner(s) shall be provided and installed on roof of vehicle. The unit shall be a roof top contemporary contoured integral evaporator/condenser type with built-in heating elements.

Each unit shall be rated at minimum of 13,500 BTU cooling capacity with a heating element rated at 5,600 BTU. A three-speed fan shall supply a maximum/minimum of 320/250 cfm air flow capacity. Air conditioner(s) shall be controlled by a wall mounted Comfort Control II LCD thermostat.

The roof mounted air conditioner shall be approximately 9.5" high x 29" wide x 40" long and weigh approximately 99 lbs.

*** Split HVAC zones into two (2) zones, one (1) on either side of pocket door and wall.**

HEATER(S)

The interior body or compartments shall be heated with two (2) Espar D5LC air heaters with up to 18,800 BTU. The heater(s) shall be connected to the chassis diesel fuel tank with a thermostat controlled 12 volt blower. Each heat unit can use from .04 gallons on low, and up to .18 gallons of diesel per hour during maximum output and blower output from 80 to 137 CFM.

If the heater unit(s) are located to heat compartments, high temperature flexible ducting shall be used from both return air and the outlet through upper compartment walls. In addition, each upper compartment dividing wall shall have large openings to allow ducting and/or air to circulate through all compartments.

FRONT INTERIOR AREA (IF1)

STREETSIDE INTERIOR AREA (IS1)

WINDOW(S)

There shall be one (1) 32" wide x 16" high, double-paned insulated, horizontal sliding window(s) installed. The window shall slide open towards the front of the vehicle such that wind pressure would tend to shut the window. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish. Sliding style windows shall be complete with a sliding screen.

- There shall be one (1) 34" wide x 14" high x 14" deep overhead cabinet(s) provided on front wall of body. 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.

INTERIOR UNDER CABINET LED LIGHTS

One (1) OnScene Solution model #70152, 10” x 6” x 7/8”, 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided under cabinet. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

INTERIOR DESK

The interior of body shall be provided with a desk top which shall be approximately 24" deep x 34" wide and located approximately 30" from floor on front wall of body.

The desk top surface shall be fabricated of 3/16" smooth finish aluminum. 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 top shall be painted dark gray with a hammer tone powder coat paint finish for a hard and durable surface.

COMMUNICATION AND ELECTRONICS CONSOLE

There shall be one (1) approx. 50"-56" wide communication and electronics console(s) provided at back of specified desk or counter top. The console(s) shall provide mounting locations for any specified radios, phones, network jacks, 120 VAC outlets, 12 VDC power points, or any required control switches. A six (6) circuit 12 VDC fuse block with cover shall be provided inside console for wiring needs.

Each console shall be rectangular in shape with a sloped hinged access cover 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.

A hinged access cover shall be provided on front to access equipment mounting and wiring with ¼ turn knobs to secure cover closed. Two (2) 12 VDC cooling fans shall be provided on ends for proper ventilation of radio and electrical equipment.

The following communications and/or electrical equipment shall be provided for;

NOTE: Printer will be on the SS corner of desk.

There shall be one (1) two-gang 12 VDC outlet(s) with faceplate provided in the front vertical face of the console.

There shall be one (1) 120 VAC, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided in the front vertical face of the console.

INTERIOR PEDESTAL SEAT, 3-POINT ABTS

One (1) Bostrom Sierra high back reclining ABTS seat(s) shall be provided. Seat(s) shall have swivel pedestal base with 3 locking positions, and 5" fore/aft adjustment. Seat(s) shall be securely mounted to the reinforced floor structure.

Seats material color shall Gray Vinyl.

The seat(s) shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. Belts shall be red in color. The buckle portion of the seat belt shall extend from the seat base towards the occupants position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

Each seat shall be wired to the on-board seat belt indicator, and Vehicle Data Recorder (VDR) systems per NFPA 1901.

STREETSIDE INTERIOR AREA (IS2)

- There shall be one (1) full 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 60" wide x 75" high x 24" deep.
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- One (1) OnScene Access white LED, full height compartment light, vertically mounted.
- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.
- The compartment light(s) shall be controlled by a latching, black rocker switch with amber indicator light. The switch shall be labeled as "COMPARTMENT LIGHTS" with a black and chrome label bezel.
- There shall be four (4) vertically adjustable shelves in each of the above cabinets.

There shall be two (2) 120 VAC custom fabricated outlet strip provided down each corner in back of cabinet. 20 amp duplex outlets.

  - The ten (10) outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R). Eqaully distributed per strip.
  - Outlet(s) shall be powered through the on-board generator system.

STREETSIDE INTERIOR AREA (IS3)

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.

- There shall be two (2) full 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 42" wide x 75" high x 30" deep.
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- One (1) OnScene Access white LED, full height compartment light, vertically mounted.
- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.
- The compartment light(s) shall be controlled by a latching, black rocker switch with amber indicator light. The switch shall be labeled as "COMPARTMENT LIGHTS" with a black and chrome label bezel.
- There shall be two (2) vertically adjustable shelves in each of the above cabinets.

STREETSIDE INTERIOR AREA (IS4)

INTERIOR BENCH SEAT

The interior body walkway shall be provided with a squad bench seat along the side wall. The bench seat base shall be fabricated of 1/8" aluminum tread plate to form a under seat storage compartment. Cargo net with buckles.

The seat cushion shall be approximately 3" thick with a 3/4" plywood platform for stability. The seat backrest shall be approximately 12" high x 2" thick and constructed the same as the seat cushion. Material to be grey vinyl.

INTERIOR AIR PACK BRACKET

Three (3) SCBA air pack bracket(s) shall be provided at the interior bench seat recessed mounted in the seat backrest. The exact model and layout shall be determined at the pre-construction meeting.

- There shall be two (2) 120 VAC outlet(s) located on the corners of each side shoulder level.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered through the on-board generator system.

SLIDE-OUT ROOM EXTENSION

A slide-out room extension with floor offset approximately 3" from main walk-in floor shall be provided on the streetside. The slide-out room shall extend approximately 32". The slide-out extension shall be up to up to 96" in width depending on body configuration. The interior height shall be approximately 9" less than the interior height of the main walk-in floor. The slide-out room shall have a water tight seal in both the fully extended and the retracted positions. The flooring specified on main walk-in floor shall be provided on floor of slide-out room.

The slide-out section shall utilize two (2) PowerGear smooth operating, quiet gear and rack system. Systems using hydraulic components will NOT BE ACCEPTABLE. There shall be only two (2) serviceable items - the 12 VDC motor and the electric control switch. The system shall use a heavy duty, positive, 100% synchronized gear and rack system to prevent binding during the extend or retract cycle. The rack system shall be rated for up to 1,500 pounds. A manual override shall be provided in the event of a system failure. The touch pad control for slide-out system shall be mounted on wall near main entry door.

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.

A full width padded foam cushion head bumper shall be provided along ceiling of slide-out. Head bumper shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one (1) 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 slide-out mechanisms.

The slide-out room extension 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 using light weight metal or fiberglass shall not be acceptable.

SLIDE-OUT AWNING

A Carefree SlideOut Kover III shall be provided and work automatically with slide-out for increased protection of the slide-out from the elements. Helps keep leaves, debris and rain off the roof and out of the vehicle and keeps the roof cooler by blocking the sun from the roof.

The SlideOut Kover III comes with a built-in wind deflector to prevent the billowing of the slide out fabric. The full-enclosure aluminum case protects the slide out fabric from dirt and debris while traveling.

- The awning fabric color shall be red.

SLIDE-OUT KOVER

The SlideOut Kovers standard white housing color shall be re-painted to match upper body color.

- There shall be two (2) 42" wide x 14" high x 14" deep 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.

- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.

INTERIOR UNDER CABINET LED LIGHTS

Two (2) OnScene Solution model #70152, 10” x 6” x 7/8”, 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided under cabinet. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

STREETSIDE INTERIOR AREA (IS5)

- There shall be one (1) interior 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 40" wide x 34" high.

  - The above cabinet(s) shall have an open front face (no door).

GALLEY REFRIGERATOR

There shall be one (1) Norcold DE-0041R 120 VAC/12 VDC refrigerator/freezer(s) furnished and installed in the galley. The unit shall be a flush mount style box with body manufacturer fabricated custom enclosure. Refrigerator shall operate from both 12 VDC and 120 VAC power. The built-in dimensions are 30-7/8" high x 23-1/4" wide x 23-1/2" deep.

- There shall be one (1) upper cabinet(s) provided on interior above specified refrigerator cabinet. 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 54" high x 24" deep and as wide as remianing area allows.

- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.

- One (1) OnScene Access white LED, full height compartment light, vertically mounted.

- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.

- The compartment light(s) shall be controlled by a latching, black rocker switch with amber indicator light. The switch shall be labeled as "COMPARTMENT LIGHTS" with a black and chrome label bezel.

- There shall be three (3) vertically adjustable shelves in each of the above cabinets.

CURBSIDE INTERIOR AREA (IC1)

SLIDE-OUT ROOM EXTENSION

A slide-out room extension with floor offset approximately 3" from main walk-in floor shall be provided on the curbside. The slide-out room shall extend approximately 32". The slide-out extension shall be up to up to 96" in width depending on body configuration. The interior height shall be approximately 9" less than the interior height of the main walk-in floor. The slide-out room shall have a water tight seal in both the fully extended and the retracted positions.The flooring specified on main walk-in floor shall be provided on floor of slide-out room.

The slide-out section shall utilize two (2) PowerGear smooth operating, quiet gear and rack system. Systems using hydraulic components will NOT BE ACCEPTABLE. There shall be only two (2) serviceable items - the 12 VDC motor and the electric control switch. The system shall use a heavy duty, positive, 100% synchronized gear and rack system to prevent binding during the extend or retract cycle. The rack system shall be rated for up to 1,500 pounds. A manual

override shall be provided in the event of a system failure. The touch pad control for slide-out system shall be mounted on wall near main entry door.

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.

A full width padded foam cushion head bumper shall be provided along ceiling of slide-out. Head bumper shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one (1) 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 slide-out mechanisms.

The slide-out room extension 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 using light weight metal or fiberglass shall not be acceptable.

SLIDE-OUT AWNING

A Carefree SlideOut Kover III shall be provided and work automatically with slide-out for increased protection of the slide-out from the elements. Helps keep leaves, debris and rain off the roof and out of the vehicle and keeps the roof cooler by blocking the sun from the roof.

The SlideOut Kover III comes with a built-in wind deflector to prevent the billowing of the slide out fabric. The full-enclosure aluminum case protects the slide out fabric from dirt and debris while traveling.

- The awning fabric color shall be red.

SLIDE-OUT KOVER

The SlideOut Kovers standard white housing color shall be re-painted to match upper body color.

WINDOW(S)

There shall be two (2) 32" wide x 16" high, double-paned insulated, horizontal sliding window(s) installed. The window shall slide open towards the front of the vehicle such that wind pressure would tend to shut the window. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish. Sliding style windows shall be complete with a sliding screen.

WINDOW(S)

There shall be two (2) 18" wide x 22" high, double-paned insulated, high non-sliding window(s) installed, one (1) on each side of the slide-out. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

- There shall be two (2) 34" wide x 14" high x 14" deep 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.

INTERIOR UNDER CABINET LED LIGHTS

One (1) OnScene Solution model #70152, 10” x 6” x 7/8”, 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided under cabinet. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

- One (1) Hon 3-drawer Efficiency Pedestal cabinet(s) shall be provided and installed. Each cabinet shall have a keyed lock and shall be painted charcoal. Each filing cabinet shall be 15" wide x 27" high x 20" deep. The bottom drawer of the cabinet shall be capable of storing 8-1/2" x 11" file folders.

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 desk top surface shall be fabricated of 3/16" smooth finish aluminum. 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.

COMMUNICATION AND ELECTRONICS CONSOLE

There shall be two (2) 34” wide communication and electronics console(s) provided at back of specified desk or counter top. The console(s) shall provide mounting locations for any specified radios, phones, network jacks, 120 VAC outlets, 12 VDC power points, or any required control switches. A six (6) circuit 12 VDC fuse block with cover shall be provided inside console for wiring needs.

Each console shall be rectangular in shape with a sloped hinged access cover 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.

A hinged access cover shall be provided on front to access equipment mounting and wiring with ¼ turn knobs to secure cover closed. Two (2) 12 VDC cooling fans shall be provided on ends for proper ventilation of radio and electrical equipment.

The following communications and/or electrical equipment shall be provided for;

There shall be two (2) two-gang 12 VDC outlet(s) with faceplate provided in the front vertical face of the console.

There shall be two (2) 120 VAC, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided in the front vertical face of the console.

There shall be one (1) Harris Radio Face plate to the console, and two (2) Harris Radio Port Pockets.

There shall be one (1) Vista Touchscreen on the left hand side of the console.

INTERIOR PEDESTAL SEAT, 3-POINT ABTS

Two (2) Bostrom Sierra high back reclining ABTS seat(s) shall be provided. Seat(s) shall have swivel pedestal base with 3 locking positions, and 5" fore/aft adjustment. Seat(s) shall be securely mounted to the reinforced floor structure.

Seats material color shall be Gray vinyl.

The seat(s) shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. Belts shall be red in color. The buckle portion of the seat belt shall extend from the seat base towards the occupants position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

Each seat shall be wired to the on-board seat belt indicator, and Vehicle Data Recorder (VDR) systems per NFPA 1901.

CURBSIDE INTERIOR AREA (IC2)

- One (1) 120/240 VAC load center.
- The generator gauge panel.

There shall be a side entry door located in this area.

CURBSIDE INTERIOR AREA (IC3)

- There shall be one (1) full 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 42" wide x 75" high x 30" deep.
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- One (1) OnScene Access white LED, full height compartment light, vertically mounted.
- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.
- The compartment light(s) shall be controlled by a latching, black rocker switch with amber indicator light. The switch shall be labeled as "COMPARTMENT LIGHTS" with a black and chrome label bezel.
- 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.
- There shall be a full width stainless steel tube located near top of cabinet for wet suit storage.

SLIDE-OUT ROOM EXTENSION

A slide-out room extension with floor offset approximately 3" from main walk-in floor shall be provided on the curbside. The slide-out room shall extend approximately 32". The slide-out extension shall be up to up to 96" in width depending on body configuration. The interior height shall be approximately 9" less than the interior height of the main walk-in floor. The slide-out room shall have a water tight seal in both the fully extended and the retracted positions.The flooring specified on main walk-in floor shall be provided on floor of slide-out room.

The slide-out section shall utilize two (2) PowerGear smooth operating, quiet gear and rack system. Systems using hydraulic components will NOT BE ACCEPTABLE. There shall be only two (2) serviceable items - the 12 VDC motor and the electric control switch. The system shall use a heavy duty, positive, 100% synchronized gear and rack system to prevent binding during the extend or retract cycle. The rack system shall be rated for up to 1,500 pounds. A manual

override shall be provided in the event of a system failure. The touch pad control for slide-out system shall be mounted on wall near main entry door.

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.

A full width padded foam cushion head bumper shall be provided along ceiling of slide-out. Head bumper shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one (1) 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 slide-out mechanisms.

The slide-out room extension 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 using light weight metal or fiberglass shall not be acceptable.

SLIDE-OUT AWNING

A Carefree SlideOut Kover III shall be provided and work automatically with slide-out for increased protection of the slide-out from the elements. Helps keep leaves, debris and rain off the roof and out of the vehicle and keeps the roof cooler by blocking the sun from the roof.

The SlideOut Kover III comes with a built-in wind deflector to prevent the billowing of the slide out fabric. The full-enclosure aluminum case protects the slide out fabric from dirt and debris while traveling.

- The awning fabric color shall be red.

SLIDE-OUT KOVER

The SlideOut Kovers standard white housing color shall be re-painted to match upper body color.

- There shall be two (2) 42" wide x 14" high x 14" deep 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.

- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.

INTERIOR UNDER CABINET LED LIGHTS

Two (2) OnScene Solution model #70152, 10” x 6” x 7/8”, 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided under cabinet. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

INTERIOR BENCH SEAT

The interior body walkway shall be provided with a squad bench seat along the side wall. The bench seat base shall be fabricated of 1/8" aluminum tread plate to form a under seat storage compartment. Cargo net with buckles.

The seat cushion shall be approximately 3" thick with a 3/4" plywood platform for stability. The seat backrest shall be approximately 12" high x 2" thick and constructed the same as the seat cushion. Material will be grey vinyl.

INTERIOR AIR PACK BRACKET

Three (3) SCBA air pack bracket(s) shall be provided at the interior bench seat recessed mounted in the seat backrest. The exact model and layout shall be determined at the pre-construction meeting.

- There shall be two (2) 120 VAC outlet(s) located on the corners of each side shoulder level.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered through the on-board generator system.

CURBSIDE INTERIOR AREA (IC5)

There shall be a side entry door located in this area.

REAR INTERIOR AREA (IR1)

- One (1) Winnipeg Fire Paramedic Service supplied stokes basket(s). Basket measuring 24"w x 8"t x 78"l secured with cargo straps.
- There shall be one (1) cabinet(s) provided on interior lower part of the compartment counter height. Cabinet(s) shall be framed in from the lower of the interior deck surface of the walk-in area. Each cabinet shall be approximately (insert actual dimensions).
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
  - The above cabinet(s) shall have an open front face (no door).
- There shall be two (2) vertically adjustable shelves in each of the above cabinets.

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.

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 over-current protective devices. Such devices shall be readily accessible and protected against heat in excess of the over-current 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.

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.

12 VOLT MULTIPLEX CONTROL CENTER

The apparatus shall be equipped with a Weldon V-MUX multiplexed 12 volt electrical system that will provide complete diagnostic capability, No Exception. 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.

Outputs:
The outputs shall perform all the following items without added modules to perform any of the tasks;

1. Load Shedding: The system shall have the capability to load shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like load shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs.

2. Load Sequencing: The system shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system.

3. Output Device: The system shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than *100 times* that of a relay.

4. Flashing Outputs: The system shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, 160 or 200 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems or other unique idea you may come up with.

5. PWM: The modules shall have the ability to PWM at some outputs so that a headlight PWM module is not needed.

6. Diagnostics: An output should be able to detect either a short or open circuit. The system should be able report in “real time” a text based message that points the maintenance person to a specific output.

Inputs:

1. The inputs shall have the ability to switch by a ground or vbatt signal.

2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

Auto-Throttle:

The multiplex system shall be able to perform automatic high idle via a network gateway or by using an existing output on a module to provide the proper signals to an OEM Engine ECU. This task should be handled with existing inputs and outputs.

Displays:

Displays shall be able to provide real time information regarding load shedding and system status, such as network traffic/errors or shorts and open circuits.

System Network:

The multiplex system shall contain a Peer-to-Peer network. A Master Slave Type network is not suitable for this type of unit. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk, **No Exceptions.**

System Reliability:

The multiplex system shall be able to perform in extreme temperature conditions, from 40° to +85° C (-40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.

WELDON CERTIFICATION

A letter shall be provided with bid submittal that the Contractor has successfully completed the Weldon training requirements for Level 1 of the V-MUX Certified Supplier Program and is authorized to design, build, and service V-MUX electrical systems.

MULTIPLEX SYSTEM VISTA IV V-MUX COLOR DISPLAY

Two (2) Weldon V-MUX Vista IV shall be provided. The Vista IV shall have seven switches with custom legends and a wide temperature operating range. The four wires shall control all lighting and HVAC. The Vista IV shall have color changes for button status. The display shall be pre-programmable (OEM Level) and be colored. The auto climate control shall display temperature set point and outside temperatures. The Vista IV shall be ready for back-up camera, thermal cameras and DVDs. Virtual switches, GPS, on-board diagnostics, 6” and 9” Pana Vise options and large font size shall also be included.

The Vista IV allows for peer to peer networking. The Vista IV shall have the ability to automatically change screens based on a predetermined state or condition for warning message or status.

The multiplex display shall be located in the cab center console for control of all master and emergency lights.

CAB CONSOLE

A center cab console shall be provided between the Driver's and Officer's seats. Console shall be as large as possible and fabricated of 1/8" smooth aluminum. A textured powder coat paint finish shall be provided for durability and finished appearance.

The rear portion of the console shall be provided with open top storage for notebooks or maps. Two (2) adjustable dividers shall be provided in the storage area. The forward portion of console shall be slanted for easy viewing of the specified multiplex display screen, and any siren or radio equipment and within easy access to both Driver and Officer. Two (2) cup holders shall be provided in console.

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.

An onboard battery conditioner or charger or a polarized inlet shall be provided for charging all batteries. Where an onboard conditioner or charger is supplied, the associated line voltage electrical power system shall be installed in accordance with Chapter 22.

One of the following master disconnect switches shall be provided:

1) A master body disconnect switch that disconnects all electrical loads not provided by the chassis manufacturer
2) A master load disconnect switch that disconnects all electrical loads on the apparatus except the starter

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 disconnect on” indicator light that is visible from the driver’s position shall be provided.

Rechargeable hand lights, radios, and other similar devices shall be permitted to be connected to the electrical system ahead of the master disconnect switch.

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 5 seconds.

BATTERY SWITCH

One (1) battery "On/Off" switch shall be provided and located in cab within easy reach of Driver. A green "BATTERY ON" pilot light shall be visible from the driver’s position.

BATTERY SOLENOID

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

BATTERY CHARGER

One (1) Newmar model PT-80 battery charger shall be provided ideal for charging multiple battery bank systems. The Newmar Phase Three “Smart” battery charging technology provides significant benefits over traditional float chargers whose output voltage droops under heavy loads, and fails to attain proper voltage levels recommended by battery manufactures as part of a proper charge cycle. These issues are particular significant in Emergency Vehicle applications where rapid recharge is required while powering DC loads, and reliable service life of batteries is critical. PT Series chargers feature multiple isolated outputs to charge independent battery banks.

Features;

- “Smart” circuitry provides three stage charging—bulk, absorption, float
- Gel-Cell/Flooded Lead-acid/AGM battery type switch selects optimum charge/float voltages
- Multiple isolated outputs - charge independent battery banks*
- Optional sensor adjusts output voltage based on battery temperature*
- Current limiting - charges dead batteries without overload
- Use as a power supply; can power Radios/MDT’s without a battery in line
- Built to last—rugged stainless steel case with circuitry hardened for hostile environments
- Remote meter included

SHORE POWER INLET

One (1) Kussmaul 120 VAC, 30 amp Super Auto-Eject shore power inlet(s) shall be provided. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged.

The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

- The outlet cover shall be yellow.

- The shore power plug shall be located near the Driver door area.

ENGINE COMPARTMENT LIGHT

There shall be one (1) OnScene Severe Service LED light(s) mounted in the engine compartment with integral switch with a light output of at least 20 candlepower (250 lumens). The engine compartment light(s) shall operate only when the master battery switch is turned "On".

MAP LIGHT

There shall be one (1) Hella goose neck 12 VDC halogen map light(s) provided and installed on the officer side dash area.

CAB HAZARD WARNING LIGHT

A Truck-Lite red LED flashing light shall be provided and located in the driving compartment and be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

- Any passenger or equipment compartment door is not closed.
- Any ladder or equipment rack is not in the stowed position.
- Stabilizer system is not in its stowed position.
- Powered light tower is not stowed.

- Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

Compartments and equipment meeting all of the following conditions shall be permitted to be exempt from being wired to the hazard light:

- The volume is less than or equal to 4 ft3 (0.1 m3).
- The compartment has an opening less than or equal to 144 in.2 (92,900 mm2).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

The hazard light shall be labeled; "Do not move apparatus when light is on."

In addition, label shall be in both English/French for units built for Canada; *"Ne pas deplacer l'engin lorsque la lumiere est allumee."*

An audible alarm shall be provided for the door ajar light.

BACK-UP ALARM

The body manufacturer shall furnish and install one (1) 107 dB(A) electronic back-up alarm. Back-up alarm to actuate automatically when the transmission gear selector is placed in reverse.

SEON INVIEW 360 VIDEO SYSTEM

An FRC, powered by SEON, model SNB100-A00 InView 360 Video system shall be provided and installed on completed vehicle. The system shall provide split video feed with bird's-eye view and individual camera views on specified display. It shall be capable of integrating with an existing vehicle system for an automatic camera view, which seamlessly switches from front/left/right/rear views based on turn signal and reverse activation. It shall also feature a switch module that allows the operator to override the default camera view. The system shall feature NTSC video inputs for (4) four cameras, and also have NTSC, CVBS (SD) 2-channel view output. It shall have a 150 degree horizontal camera view angle, and have a resolution of 720 x 480 at 30 FPS (frames per second).

System shall include:

- Four (4) CA 650TVL – Standard Definition Cameras (360 system) 2.4" L X 2.0" H X 1.7" D
- Electronic Control Unit (ECU) 4.54" L x 6.24" H X 1.34" D
- Required harnesses
- Manual camera switch

System shall be calibrated and fully functional upon delivery.

VIDEO MONITOR

One (1) FRC, powered by SEON, model SNA010-B10 InView 360 SAV-MON, AVM 10" in cab video monitor(s) shall be provided and installed easily visible to driver and include a 10" diagonal color LCD monitor. The monitor shall be a TFT Active Matrix System display with an 800 x 480 resolution and a display format of 16:9 (aspect ratio). It shall operate from 12 VDC, and the connection terminals shall include a composite video in and power in.

INTERIOR LED LIGHTS

Twelve (12) OnScene Solution model #70154, 10” x 10” x 7/8”, 10-30 VDC, surface white LED light(s) with clear lens shall be provided throughout the vehicle. In addition light(s) will be capable of a five (5) second delay after switching off.

The light(s) shall be switched with high/low intensity setting at the entry door(s). An Innovative Controls black back-lit switch panel shall be provided to control specified lighting or other control switching.

Layout per sales drawing.

TAIL LIGHTS

Rear body tail lights shall be vertically mounted and located per Federal Motor Vehicle Safety Standards, FMVSS and Canadian Motor Vehicle Safety Standards CMVSS. The following lights shall be furnished;

- Two (2) Whelen M9 Series M9T amber LED turn signal lights
- Two (2) Whelen M9 Series M9BTTX red LED stop/tail lights
- Two (2) Whelen M9 Series M9BUW LED back-up lights with clear lens

Each of the lights above shall be mounted in a M9FC, chrome finish bezel.

Each light shall have a black flange.

MIDSHIP MARKER/TURN SIGNAL

Two (2) Whelen model T0A00MAR 2" round amber LED midship body clearance marker/turn signal lights shall be provided and installed, one (1) light on each side of the body, in forward wheel well of rear axle. Midship marker/turn lights shall be wired to the headlight circuit of the chassis.

MARKER LIGHTS

The body shall be equipped with all necessary side and rear clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). Clearance lights shall be Truck-Lite model 18 series, 3 diode LED, reflectorized type to reduce the need for maintenance and lower the amp draw. Clearance lights on body shall be connected to the clearance light circuit of the chassis.

REAR BUMPER MARKER LIGHTS

Two (2) Britax style dual face flexible mounted rear bumper markers shall be located, one (1) each side lower rear corner of body visible from driver mirrors.

CAB STEP LIGHTS / GROUND LIGHTS

There shall be two (2) OnScene 8" Access white LED light(s) installed on the vehicle 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 on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened.

LICENSE PLATE LIGHT

One (1) Arrow #437 chrome plated LED license plate light shall be installed on the rear of the body. License plate light shall be wired to the headlight circuit of chassis. A fastener system shall be provided for license plate installation.

ELECTRONIC SIREN

One (1) Whelen model 295HFS2X electronic siren control with selectable 100 or 200 watt output, dual function, with removable microphone, and California Title 13 compliant shall be provided and installed in cab within easy reach of Driver. Siren power shall be wired through the master warning light switch.

VIBRATING TONES SOUND DEVICE SYSTEM

One (1) Federal Rumbler vibrating tones sound device shall be provided. Rumbler shall be connected to specified primary electronic siren amplifier. Siren power shall be wired through the master warning light switch. The speakers for system shall be mounted under front of vehicle and protected from weather or road damage.

SIREN SPEAKER

One (1) Whelen model SA314A 100 watt aluminum, 6.4" x 6.1" x 3.1" deep siren speaker shall be provided and located behind grill or front bumper with natural aluminum finish. The solid state siren speaker shall be vibration resistant. The SA314A shall comply with California Title XIII, Class A, and SAE J1849 requirements and with OSHA 1910.95 Guidelines regarding “Permissible Noise Exposure”. All mounting hardware shall be stainless steel and covered by a two year factory warranty.

The siren speaker shall be located on the streetside of front bumper.

SIDE LED SCENE LIGHTS

There shall be five (5) Whelen M9 Series Model M9LZC , 9" x 7" surface mounted Scene Light(s) provided on the upper Body. Light quantity shall be divided equally per side. The M9LZB configuration shall consist of 24 clear Super-LEDs and a clear gradient optic polycarbonate lens with black flange. The M9LZB series light shall have 6,500 useable lumens each. The scene light is covered by a five year factory warranty.

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 controlled at the multiplex display(s) in the cab.

REAR LED SCENE LIGHTS

Two (2) Whelen M9 Series Model M9LZB , 9" x 7" surface mounted scene light(s) shall be provided on the upper rear body to light the work area. The M9LZB configuration shall consist of 24 clear Super-LEDs and a clear gradient optic polycarbonate lens with black flange. The M9LZB series light shall have 6,500 useable lumens each. The scene light is covered by a five year factory warranty

The above scene lights shall light to a level of at least 3 fc (30 lx), measured at 25 equally spaced points on a 2.5 ft (750 mm) grid with in a 10 ft x 10 ft (3 m x 3m) square to the rear of vehicle.

The lights shall be controlled at the multiplex display(s) in the cab.

The rear scene lights shall also be activated when the apparatus is in reverse.

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 (4) 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 (4) 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 (2) separate signaling modes during emergency operations. One (1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One (1) 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 (2) 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.

Steadily burning, non flashing optical sources shall be permitted to be used.

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 Freedom F4N7VLED LED 72" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

SECTION	INTERNAL COMPONENTS	LENS COLOR

1	Red Rear Corner LED	Clear
2	Alley Light	Clear
3	Red Front Corner LED	Clear
4	Blank	Clear
5	Red Super Long- LED	Clear
6	Blank	Clear
7	White Super Long- LED	Clear
8	Blank	Clear
9	Red Super Long-LED	Clear
10	Red Super Long-LED	Clear
11	Blank	Clear
12	White Super Long- LED	Clear
13	Blank	Clear
14	Red Super Long-LED	Clear
15	Blank	Clear
16	Red Front Corner LED	Clear
17	Alley Light	Clear
18	Red Rear Corner LED	Clear

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(s) shall be separately controlled at switch panel in the cab.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen C9 Series SurfaceMax linear super-LED Light(s) with full-fill optics provided, one (1) each side. The integral Flasher shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty.

Each light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen C9 Series SurfaceMax linear super-LED Light(s) with full-fill optics provided, one (1) each side. The integral Flasher shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power and covered by a five year factory warranty.

Each light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen C9 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be (factory default) Action Scan.

The lights shall be controlled at the multiplex display(s) in the cab.

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 1600 mm) above level ground.

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

There shall be two (2) Whelen C6 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each Light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

There shall be two (2) Whelen C6 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each Light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

ZONES B AND D - BODY LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen C6 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each Light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen C6 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each Light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen C6 SurfaceMax, linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities. Component shall be covered by a five year Whelen factory warranty.

Each Light shall have:
- Red LEDs
- Red Lens

Each light shall have a black flange.

– Flash Pattern shall be Whelen Action Scan (Factory Default)

The lights shall be controlled at the multiplex display(s) in the cab.

LINE VOLTAGE ELECTRICAL SYSTEM

DIESEL GENERATOR

An Onan model SM20-1 diesel driven generator shall shallbe installed on the vehicle. The generator shall be installed so that fumes, vapors, heat, and vibrations do not enter the driving or crew compartment. The generator shall be rated at 20,000 watts continuous at 120/240 VAC, 166/83 amps, single phase. Current frequency shall be stable at 60 hertz.

The engine shall be a Kubota model V2403-CR-TIE4BG, with fuel consumption @ 25% / 50% / 100% Load .44 / .88 / 1.75 (US Gal./hr.). Unit shall be 58" wide x 26.00" deep, x 34" high, and weigh 1,140 lbs.

If the generator is installed in a compartment and the compartment doors must be open during its operation, the generator shall be equipped with an interlock system to prevent its operation if the doors are not open, or the compartment shall be equipped with a high temperature alarm.

If the generator is located in a position on the apparatus where the operator cannot see the instrumentation and operate the controls while standing at ground level or positioned at a specifically designated operator station, an operating panel with the required instrumentation, start and stop controls, and other controls necessary for safe operation shall be provided at a remote operator’s panel.

Generator shall be equipped with a high temperature automatic shutdown system and a low oil (pressure or level) automatic shutdown system. The generator shall be installed in accordance with the generator manufacturer's requirements for ventilation and service accessibility.

GENERATOR BONDING

A minimum of four (4) 16" x 2 gauge copper ground straps shall be bolted to body sub-frame and chassis sub-frame for proper bonding of high voltage system. 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.

WARRANTY PERIOD

Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Generators shall be free from defects in material and workmanship for a period of two (2) years or two thousand (2,000) hours, whichever comes first, from the date of delivery to the first purchaser.

GENERATOR MOUNTING

The generator shall be mounted in a lower exterior compartment on rubber vibration isolators. The compartment shall be reinforced where necessary to hold weight of generator. A valve shall be provided on the generator oil drain outlet and piped to underside of generator compartment with flexible hose and plug. The drain shall be located where easily accessible for generator service.

FUEL SYSTEM

The generator fuel system shall be plumbed to the chassis main fuel tank. A separate fuel line shall be installed directly from the tank, not connected to the truck engine fuel line system. The generator fuel line shall be properly protected and secured inside of chassis frame. A shut-off valve shall be provided between the generator and fuel line as it enters the compartment.

Fuel lines shall be protected from chafing at all wear points. If the fuel source is shared with the apparatus engine, a separate fuel pickup system shall be provided that is arranged to ensure that the generator cannot utilize more than 75 percent of the fuel tank capacity.

STARTING SYSTEM

The generator starting system shall be powered by chassis battery system with heavy duty stranded copper cables. The starter line shall by-pass the chassis master switch to permit generator operation when the apparatus engine is not running. This starter line shall be of sufficient size for the generator, adequately protected and supported inside the chassis frame area.

COOLING

Since the generator is radiator cooled, the ventilation of the generator is crucial. The installation shall permit operation of the unit both while the apparatus is stationary and while it is in motion.

The cooling air flow shall be through screened panels in the compartment doors. Two (2) dual Flex-a-lite fans will be installed to help direct the air flow through the compartment; one (1) fan will push the air into the compartment while the other fan pulls the air out.

The additional fans shall provide adequate air flow for operation of the generator in stationary or moving, with the compartment doors in the closed position.

EXHAUST SYSTEM

The generator exhaust system shall be equipped with a residential type muffler for maximum quieting, and black iron rigid pipe to link the generator to the muffler.

The exhaust piping and discharge shall be located or shielded to prevent thermal damage to the apparatus or equipment. The exhaust shall be piped to the exterior of the vehicle and discharged at a location away from any operator's position.

Where parts of the exhaust system are exposed so that they can cause injury to operating personnel, protective guards shall be provided.

Silencing devices shall be provided and shall not create exhaust back pressure that exceeds the limits specified by the engine manufacturer.

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.

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.

GENERATOR CONTROLS

In addition to generator controls provided at the generator, there shall be controls provided in the cab near the 12 volt control panel. The following controls shall be provided:

- One (1) pre-heat switch (if generator is diesel).
- One (1) start/stop switch.
- One (1) generator running indicator light.

LOADCENTER

The loadcenter shall be an Eaton BR Series specifically designed for protection and distribution of AC line voltage such as lighting and small motor branch circuits. The loadcenter enclosure is made of 16 gauge galvanized sheet steel with a galvanized coating provided for corrosion protection. All trims used on BR loadcenters are chromate sealed and finished with an electro-disposition epoxy paint (ANSI-61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door is supplied with indoor loadcenters rated from 100 through 400 amperes. All plug-in loadcenters are CSA listed to file LL98266. CSA Certified to C22.2 No.29, to loadcenter type and CSA listing.

Location to be forward side of the pocket door wall on curbside of interior.

GENERATOR MONITORING PANEL

An Accuvim CL digital meter package shall be provided to properly monitor the generator performance and load demand during operation. The electrical parameters can be viewed on a backlit LCD screen. The 15 screens are accessible via four buttons on the front panel allowing the user to scroll between various screens. The following shall be displayed full-time;

- Generator frequency in hertz
- Line 1 current in amperes
- Line 2 current in amperes
- Generator voltage in volts

In addition, an elapsed generator hours gauge shall be provided near the digital meter.
Locate adjacent to braker panel.

SHORE POWER INLET - BATTERY CHARGER

The above mentioned shore power inlet, and battery conditioner shall be specified in the 12 volt section.

SHORE POWER INLET - SPECIFIED CIRCUITS

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.

SHORE POWER INLET

One (1) Kussmaul 120 VAC, 30 amp Super Auto-Eject shore power inlet(s) shall be provided. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged.

The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

- The outlet cover shall be yellow.

- The shore power inlet shall be located on the streetside front of body, outboard of the cab.

Shore power inlet shall be wired to the following specified 120 VAC circuits;

Shore power shall be wired to all primary 120 VAC, 20 ampere electrical outlets on apparatus (maximum of two (2) circuits). Circuits shall be provided with circuit breaker protection with either generator or shore power providing power.

OUTLETS AND CIRCUITS

The generator and or shore power shall supply the 120/240 volt electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

LINE VOLTAGE ELECTRICAL SYSTEM

GENERAL REQUIREMENTS

Stability

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz, ±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 ±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 panel board or in other system components between the neutral and equipment-grounding conductor shall be removed and discarded.

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.

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.

Power Supply Assembly

The conductors used in the power supply assembly between the output terminals of the power source and the main over current 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 amperage rating and shall be sized to carry not less than 115 percent of the amperage 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).

Over-current Protection

Manually re-settable over current devices shall be installed to protect the line voltage electrical system components.

Power Source Protection

A main over current 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 over current protection device shall not exceed 100 percent of the rated amperage stated on the power source specification label or the rating of the next larger available size over current protection device, where so recommended by the power source manufacturer.

If the main over current protection device is subject to road spray, the unit shall be housed in a Type 4–rated enclosure.

Branch Circuit Over-current Protection

Over current 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 panel board 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 over current 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.

Panelboards

All fixed power sources shall be hardwired to a permanently mounted panel board 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 over current devices.
2) Only one circuit is hardwired to the power source, which is protected by an integrated over current device.

The panel shall be visible and located so that there is unimpeded access to the panel board controls. All panel boards 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.

Wiring Identification

Each line voltage circuit originating from the main panel board 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 pre-wiring 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.

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

120/240 VAC SCENE LIGHTING

LIGHT TOWER

One (1) Command Light, CL Series light tower(s) shall be provided and installed on the completed unit.

The Command Light shall be covered by a five (5) year limited warranty from defects in materials and workmanship. An operation, maintenance, and parts manual shall be provided with the completed unit.

Light Tower Construction and Design

The Command Light assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum. Light towers that have not been tested to these conditions are not acceptable.

The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Light towers that are only capable of rotation at the top of a pole are not acceptable to the specified light tower.

Light Tower Electrical System

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA 1901.

A red flashing or rotating light located in the driving compartment shall be illuminated automatically whenever the vehicles parking brake is not fully engaged, indicating that the light tower is not in stowed position, as required by NFPA 1901.

Light Tower Floodlights

The Command Light model CL602A-W2 shall be equipped with the following bank of floodlights:

Floodlight manufacturer:	Whelen Engineering
Number of lamp heads:	Six (6) Pioneer Plus PFP2AC LED
Voltage:	120 volts
Watts of each lamp head:	150 watt
Total watts of light tower:	1350 watts
Total lumens of light tower:	90,000 lumens
Configuration:	The light heads shall be mounted with three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

Light Tower Strobe Indicator

The floodlight tower shall have a strobe indicator located on the top of the upper section.

The lens color for the strobe light shall be amber.

Light Tower Backlight Option

A backlight option shall be provided on the light tower. The lower pair of light heads shall be capable of being rotated about a horizontal axis 180 degree, providing light down on the vehicle or to the opposite side of the vehicle while allowing the fixed lights to remain pointed at the scene.

The hand-held remote control shall have an additional switch supplied for the backlight rotation option.

Light Tower Paint

The light tower shall be electro-statically powder coated with a hammer tone gray color.

Light Tower Controls

The light tower(s) shall be operated with a hand-held 15-foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature. The remote control shall be located per the itemized compartment list and include;

Three (3) switches; one (1) for each pair of lights.
One (1) switch for light bank rotation.
One (1) switch for elevating lower stage.
One (1) switch for elevating upper stage.
One (1) switch for optional light bank rotation.
One (1) switch for the optional strobe.
One (1) indicator light to indicate when light bank is out of the roof nesting position.
One (1) indicator light to indicate when light bank is rotated to proper nesting position.

Light Tower Mounting

The specified light tower(s) shall be mounted on the roof of the body.

INFORMATION TECHNOLOGY (IT) SYSTEMS

All information technology systems specified below shall be supplied, installed, and supported by the contractor including, but not limited to the design, inter-connecting wiring, and integration of all specified systems. Under no circumstances will the installation of these systems be subcontracted

The following information technology systems shall be provided and installed on completed unit as follows;

INTERNET CONNECTION

DATA ROUTER

A Sierra Wireless AirLink MG90 (Band 16 capable) shall be provided.

VIDEO SYSTEM

EXTERIOR VIDEO SYSTEM

No exterior body mounted video monitoring system shall be required on completed unit.

BROADCAST TV ANTENNA

One (1) Winegard Sensar III, RV-3095 broadcast TV antenna w/ amplified multi-switch shall be provided on roof of completed unit.

The 75 ohm Sensar RV-3095 antenna has built-in amplifier and unique circuitry that gives you clear VHF/UHF reception whenever you park. Raise, lower and rotate the Sensar III antenna from inside the vehicle.

The travel height of the antenna shall only be 4" above the roof. The antenna can be elevated to 40" above the roof line, and is bi-directional, it must be pointed toward the TV station you want to watch. It must be used while the vehicle is parked. The Sensar antenna is made of tough UV protected Centrex polymer and other materials that are corrosion resistant.

LCD VIDEO DISPLAYS

Two (2) Samsung 27", LED TV's with tuners, and monitor mounts ; there will be velcore straps around TV to keep secure during transport.
Display(s) shall be complete and fully operational, including all miscellaneous coax cable, 120 volt AC wiring, and cable connections.

MONITOR MOUNT

Specified monitor(s) shall be mounted to desk or wall using a Ram RAM-D-101U246 (or equal) double ball mount black aluminum flat surface mount with a 3.68" diameter base, standard length arm, and 4.75" square VESA 75/100mm compatible plate.

BOSCH AUDIO/VIDEO RECORDER

One (1) Bosch DIVAR DRH-5532-414N00 (or equal), high-resolution recorder for IP and analog surveillance systems shall be **provided and installed in IC2 on completed vehicle.**
Combination of up to 16 IP and 16 analog camera channels, 1 HDD with 4 TB storage are provided..

The DIVAR hybrid recorder can simultaneously record and view video from traditional analog cameras as well as IP cameras. The recorder can be connected to the following camera configurations:

- Maximum 32 IP cameras recording at resolutions up to 12MP
- Maximum 16 analog cameras recording at resolutions up to 960H
- Combination of maximum 16 analog cameras and maximum 16 IP cameras

These advanced technologies, coupled with efficient network data transmission, deliver the high security and reliability required for modern surveillance systems. Simultaneous remote or local monitoring, recording, archive and playback functions are guided by simple menu selections and operator commands.

Simultaneous record and view
The DIVAR records multiple video and audio signals while simultaneously providing live multi-screen viewing and playback. Comprehensive search and playback functions provide quick recall and viewing of recorded video.

Simple operation
The DIVAR is very easy to install and use. Simply connect the cameras, apply power, and follow the simple Install Wizard steps for initial setup. The unit can then record automatically with no further intervention required.

Inputs and outputs
Video inputs, audio inputs/output, and alarm inputs/ outputs are located on the rear panel. Two video connectors (VGA/HDMI) provide simultaneous output for monitor A for live display (with zoom) and playback (display can be frozen and zoomed). The displays allow full-screen, multi-screen,
and sequenced viewing.

Network control
Use the PC software or built-in web application via a network for live viewing, playback, and configuration.

Watermark
The DIVAR includes an authenticity check for both local and remote archives, ensuring recording integrity. An Archive Player is provided for playback of secure video files and to check if video is authentic.

Smartphone App
A DIVAR Viewer App from Bosch for iOS and Android devices is available for:

- live and playback viewing
- recorder configuration
- PTZ control

This means you can watch live video from cameras connected to the DVR from anywhere in the world. You can also control focus, pan, tilt and zoom on PTZenabled cameras.

ENTRYLINK SYSTEM PRE-WIRE

A Con-Space EntryLink system pre-wire shall be required on completed unit. Pre-wire shall include all cabling from desk area where system will be used to exterior of vehicle where antenna will plug into vehicle.

MODEL # SC-EL-350

RADIO AND COMMUNICATION SYSTEM

ANTENNA INSTALLATION

There shall be one (1) antenna mounts provided and installed on the roof. The end of each radio antenna shall be routed to curbside slide out.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Winnipeg Fire Paramedic Service shall provide the whip.

WEATHER SYSTEM

WEATHER SYSTEM

An Orion™ vehicle-mounted weather station shall be provided and installed on completed unit. Weather station shall be specifically designed for emergency management with a mast and sensor module that attaches quickly and easily to any vehicle with the exterior mounting brackets installed. This compact, all-in-one sensor module is very durable and has no moving parts. A single cable attaches through an external connector mounted on the vehicle. Inside, the Orion Interface Module provides power to the sensor transmitter and communication ports for both computer and weather display console. The 9-ft telescoping sensor mast is made of rugged anodized aluminum, with heavy-duty, powdered-coated steel mounting brackets. The built-in North Orientation Offset feature quickly and efficiently orients wind direction readings. A permanent “snap-on” mounting adapter allows you to quickly remove and reinstall the sensor head without losing North orientation.

Sensor Specifications:

Wind Speed: Ultrasonic
Range: 0-115mph
Accuracy: ±3% at 10 m/s
Resolution: 1 mph
Units Available: knots, mph, km/hr, m/s

Wind Direction: Ultrasonic
Azimuth: 0-360°
Accuracy: ±2°
to 140°F
Units Available: ° Azimuth

Temperature: Capacitance
Range: -60 to 140°F
Accuracy: ±-0.5°F at 68°F
Resolution: 0.1°F
Units Available: °F, °C

Relative Humidity: Capacitance
Range: 0 - 100%
Accuracy: ±3% (0-90%), 5% (90-100%)
Resolution: 1%
Units Available: %RH

Barometric Pressure: Capacitance
Range: 17.50 to 32.50 InHg
Accuracy: ±0.015 InHg at +32 to 86°F ±0.03 Resolution: 1° InHg at -60

Resolution: 0.1 InHg
Units Available: Kpa, mbar, InHg
Precipitation: Impact
Range: cumulative
Collection Area: 602cm
Accuracy: ±5% (spatial variations may exist)
Resolution 0.001 in. (0.0254mm)
Units Available: mm, inches

Weather Parameters

- Temperature
- Barometric pressure
- Wind direction
- Wind speed with gust
- Relative humidity
- Rainfall

Calculated Parameters

- Average wind speed
- Heat index
- Wind chill
- Daily max/mins

Standard System Includes:

Sensor Module Orion Transmitter housed in a Self-Aspirating Radiation Shield with:

- Temperature Sensor
- Relative Humidity Sensor
- Digital Barometer
- Ultrasonic Wind Direction/Speed Sensor
- Impact Rain Sensor

- Orion Interface Module with Dual Communication Ports
- Comprehensive User Manual
- Telescoping Sensor Mast (9-foot) and Truck Mount Brackets
- RS-232 Computer Cable, 6 feet

WEATHER SYSTEM MOUNTING

The weather system shall be mounted on a Fire Research model 530 series side mount push up telescopic pole. The pole shall be mounted on the curbside rear ajacent to ladder.

The pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 2 3/4" offset. Pole shall be supplied with hazard switch option and wired to door ajar circuit to warn when pole is in the up position. The weather system quick release wiring connector shall be located near pole location. Overall length with Weatherpack mounted unit is approx. 90".

WEATHER SYSTEM SOFTWARE

The standard weather system software shall be upgrade to the WeatherMaster™ professional monitoring and database software which automatically interfaces with CAMEO/ALOHA software for HazMat applications such as plume modeling.

COMMAND CAMERA SYSTEM

There shall be one (1) Bosch MIC IP Starlight camera with black housing model MIC-750-Z30B with standard internal heater and fan, and lens wiper provided and installed on completed vehicle with a MIC-DCA-HB deep conduit mount. The camera's true advantage is its rugged design combined with Intelligent Video Analytics developed specifically for the most demanding environments. The camera is well-suited for extreme environments and adverse weather conditions such as high winds, rain, fog, ice, and snow. The camera operates at extreme temperatures ranging from -40 °C to +65 °C (-40 °F to +149 °F). Even in extreme conditions and challenging illumination scenarios, the camera provides the highest-quality video images and relevant data interpreted directly at the source. H.265 compression technology, Intelligent Dynamic Noise Reduction and dynamic Encoder Regions contribute to bit rate saving.

The cameras aluminum housing receives a corrosion protection surface treatment, along with robust, powder coat paint. Reliable O-ring seals completely protect the internal components from the external environment, meaning that there is no need to pressurize the camera. To guarantee unit integrity, the factory tests each MIC camera for leaks before shipping.

The latest sensor technology combined with the sophisticated noise suppression results in an exceptional sensitivity in color. The low-light performance is so good that the camera continues to provide excellent color performance even with a minimum of ambient light.

The dynamic range of the camera is outstanding and is obvious in real-world performance comparisons. In extended dynamic range mode, the camera uses an electronic shutter to capture four images with different exposure time and reproduce a high-contrast frame. The result is that you can view details in both the bright areas (highlights) and the dark areas (shadows) of a scene at the same time. You can easily distinguish objects and features (for example, faces) with bright backlight.

The pan and tilt mechanism is a ruggedized, direct drive system. The brushless motors directly control the pan and tilt movement using a finely-tuned gear train designed to minimize backlash and support continuous operation without significant wear and tear. With a full 360º continuous rotation pan and 290º tilt control (on upright models without illuminators) and super-quick pan (120°/second) and tilt (90°/second) for exceptional viewing capability, the camera outperforms other cameras in its class.

The camera is capable of delivering high-quality and high-resolution video with very low network load. With a doubling of encoding efficiency, H.265 is the new compression standard of choice for IP video surveillance systems, and of quad streaming which allows the camera to deliver independent, configurable streams for live viewing, recording, or remote monitoring via constrained bandwidths.

A 95 W midspan high-power PoH (Power Over HDBase T) device shall be provided that provides data and power between an Ethernet (remote network) switch and camera.

TECHNICAL SPECIFICATIONS

Imager	1/2.8-type Exmor R CMOS sensor
Effective Picture Elements (Pixels)	1945 x 1097 (2.13 MP)
Lens	30x motorized Zoom 4.3 mm to 129 mm F1.6 to F4.7
Field of View (FOV)	2.3° to 63.7°
Focus	Automatic with manual override
Iris	Automatic with manual override
Digital Zoom	12x

TELESCOPING PNEUMATIC MAST

The vehicle 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.

Mast shall be wired to a red flashing warning light in cab visible to the driver to warn when the mast is out of the nested position.

A 70' Nycoil conduit measuring 1" ID x 16-1/2" OD coil shall be provided for the 7-42 telescopic mast.

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 key ways 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 shall 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.

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 1901.

A red flashing or rotating light located in the driving compartment shall shall be illuminated automatically whenever the apparatus's parking brake is not fully engaged, indicating that the light tower is not in stowed position, as required by NFPA 1901.

MAST MOUNTING - EXTERNAL

The above telescoping mast shall be mounted using an external mounting kit attached to the rear body panel. The mast shall be enclosed with a removable 3/16" smooth aluminum enclosure located on the rear of the body extending from bumper level upward to enclose mast. 2" x 2" x 1/4" angles shall be welded to rear body panel for attachment of enclosure to body. The mast enclosure shall be provided to protect the control cables, air hoses, and the mast from the elements. The specified camera system shall extend above the enclosure, but still be lower than body height.

Controls for the mast shall be recessed into mast enclosure in a Cast Products aluminum box with hinged door. A removable panel shall be provided on side for access to lower section of mast for maintenance purposes.

A stainless steel scuff plate shall be provided on upper section of rear body panel to prevent scuffing of Nycoil cable on body surface.

MAST COVER

The mast enclosure shall be approximately 18" x 18" x full body height. Enclosure shall be fabricated from 1/8" 3003 H14 alloy aluminum and painted same as body color(s).

CAMERA ENCLOSURE DOOR

The top of the mast enclosure shall have a 12 VDC electric actuated door to prevent rain and snow from accumulating on camera while truck is traveling. The enclosure door will automatically raise with the mast controls.

ANTENNA CABLING

No antenna communications cables shall be provided for future antennas to top of pneumatic mast base.

PRINTER/COPIER/SCAN/FAX

One (1) HP OfficeJet 8720 (or equal) All-In-One printer/copier/scan/fax with built-in wireless wi-fi shall be provided on completed unit in IS1 corner of desk. Printer shall be secured to shelf or countertop for mobile application.

Unit shall be complete and fully operational, including all required cabling, 120 volt AC wiring, and cable connections. All paperwork and software provided with purchased unit shall be provided in a plastic sleeve attached to unit when delivered.

PHONE AND NETWORK CABLING STANDARDS

If a telephone or fax machine is specified it will be connected to the central phone system from the RJ-11 wall jacks and wired through to the data rack or technical cabinet using yellow Category 6, 4 pair twisted copper cabling with yellow boot ends.

If a computer network is specified it will be connected to the network switch location, if specified from the RJ-45 wall jacks wired through to the data rack or technical cabinet using blue Category 6, 4 pair twisted copper cabling with blue boot ends. The pin pair assignments will be based on the T568B standard configuration. The termination ends in shall be RJ-45 male ends and connected to the network switch.

Only Category 6, 4 pair twisted copper cable shall be used for all computer cabling for improved transmission performance and superior immunity from external noise. All wiring shall be installed to Institute of Electrical and Electronics Engineers (IEEE) 802 standards.

All Category 6 cable must be properly installed and terminated to meet specifications. Incorrect installation practices include kinking or bending the cable too tightly will not be allowed. The cable bend radius should be no less than 4 times the outer diameter of the cable. Incorrect termination practices include untwisting the wire pairs or stripping the outer jacket back too far will not be allowed. When used for 10/100/1000 BASE-T, the maximum allowed length of a Category 6 cable is 100 meters (330 ft). All cabling shall be properly labeled at both termination ends for proper identification in future.

The running of Category 6 cabling in the same loom with any VAC wiring will not be allowed.

WIRING CHANNELS

Minimum 4" x 4" wiring channels shall be provided directly below the desk tops along the outside walls for computer, radio, and communications wiring. The top of desk tops shall have minimum 3" diameter openings that drop directly into wiring channel. The wiring channels shall have openings for future wiring installation and access. The wiring channels shall run as direct as possible to the data rack or technical cabinet location with several cross overs provided in roof structure for running wiring across body.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1901 standards, the special service vehicle shall be designed for an equipment loading allowance of 6,000 lbs. of Winnipeg Fire Paramedic Service provided equipment based on a 40,001 - 50,000 pound gross vehicle weight rating.

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) Zico SAC-44-E 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 behind rear wheels, below body on streetside.

- One (1) Streamlight FireBox LED flashlight(s) with shoulder strap shall be provided be provided with 540/330 lumen output and 7/15 hour run time.. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have a LED E-Spot spotlight style bulbs and reflectors with 2 ultra-bright LED taillights. The flashlight(s) shall be wired to battery direct unless otherwise specified by Winnipeg Fire Paramedic Service.

The flashlight(s) shall be mounted in the crew dress area of IS4 / IC4 slideouts forward wall.

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1901 for special service vehicles, section 10.9.3 shall be supplied and mounted by Winnipeg Fire Paramedic Service before the unit is placed in emergency service.