



FORM FOR PROPOSAL DEVIATIONS

The following form shall be completed for each condition, exception, reservation or understanding (i.e., Deviations) in the proposal according to "Conditions, Exceptions, Reservations and Understandings".

Deviations # _____ Offeror: National Bus Sales

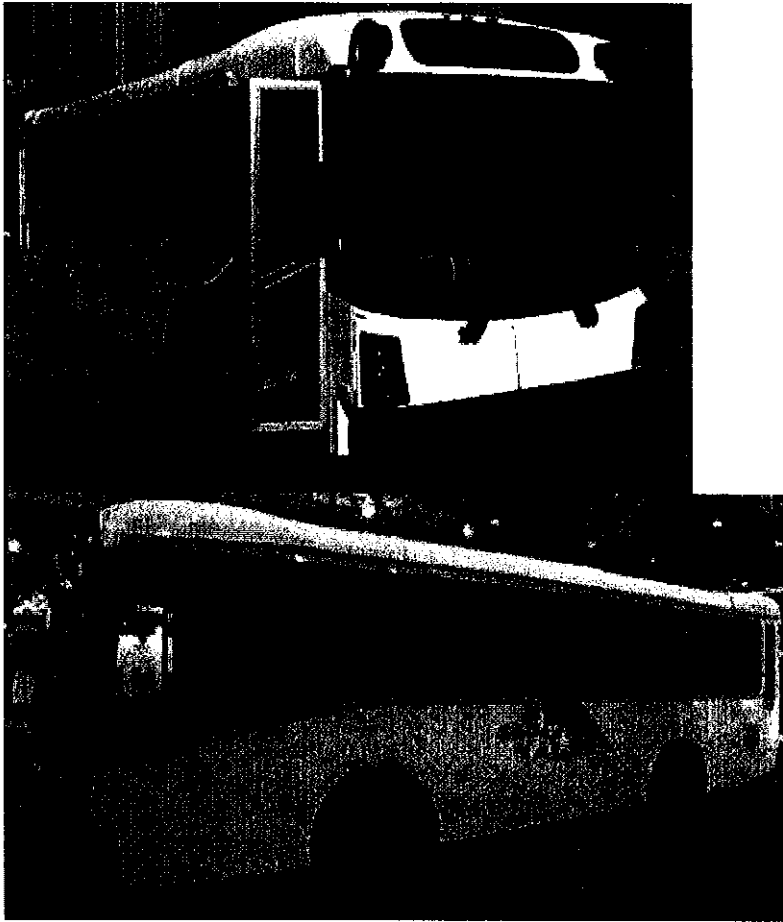
Solicitation Ref: TXDOT-070-099 Page: 43 to 154 Section: Technical Specifications

Complete Description of Deviations: _____

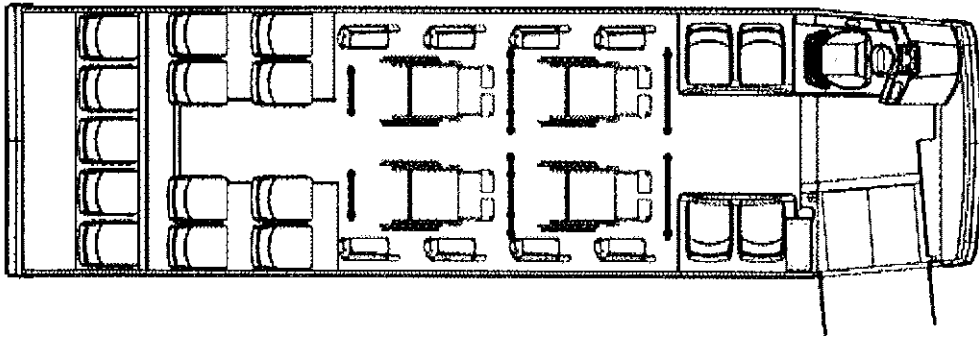
Consideration to use spirit of Liberty medium-duty rear engine

Rationale (Pros & Cons): See attached information

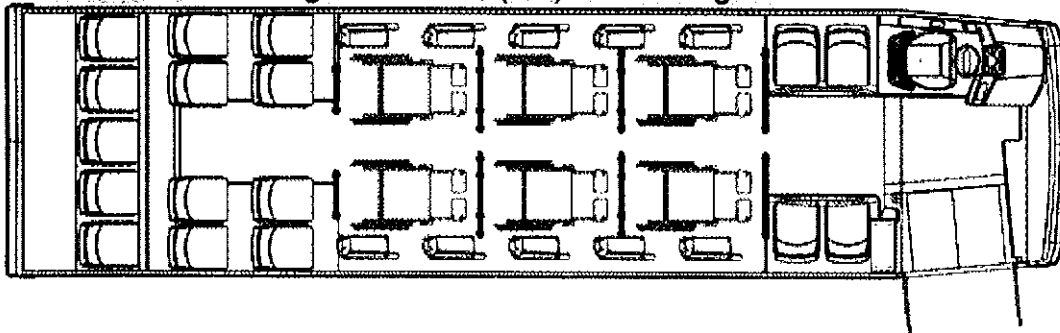
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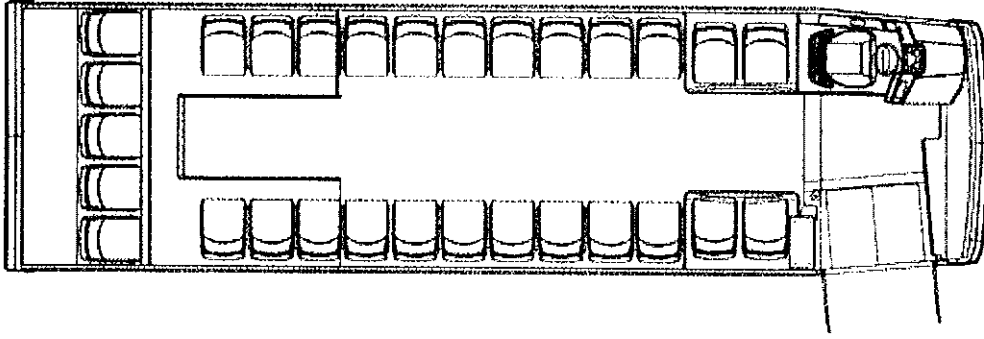
SOL 2800 - 31 Passengers or 4 W/C (54")/17 Passengers



SOL 3300 - 37 Passengers or 6 W/C (54")/17 Passengers



SOL 3000 - 29 Passengers



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SPIRIT OF LIBERTY

File Location: S:\Engineering\Liberty dimensional & specification doucment

GENERAL DIMENSIONS	SOL 2950
Gross Vehicle Weight (GVWR)	25,900# / 11748kg
Gross Axle Weight (Front)	10,000# / 4536kg
Gross Axle Weight (Rear)	17,500# / 7938kg
Estimated Curb Weight	16,500# / 7884kg
Wheel Base	150" / 3.81 M
Overall Body Length (Steel Bumpers)	20' 8" / 9.04 M
Overall Body Length (Energy Absorbing Bumper)	30' 6" / 9.29 M
Approach Angle	9*
Departing Angle	8.7*
Break Over Angle	12*
Overall Body Height / w/o Hatch or A/C	120" / 3.04 M
Overall Body Width (w/o mirrors)	100" / 2.54 M
Overall Body Width (w/mirrors)	121.5" / 3.08 M
Interior Height (Front)	85" / 2.08 M
Interior Height (Rear)	79" / 2.00 M
Interior Width	97" / 2.46 M
Entrance Step Height @ Ride Height	12.5" / 317.5 MM
Entrance Step Height when kneeling	10" / 254 MM
Fuel Tank Capacity	70 gal / 265 L
Front Track Width	85" / 2159 MM
Front Overhang w/Steel Bumper	89.75" / 2274 MM
Front Overhang w/Energy Absorbing Bumper	94.75 " / 2406 MM
Rear Overhang w/Steel Bumper	115.93" / 2944 MM
Rear Overhang w/Energy Absorbing Bumper	120.93" / 3071 MM
Height Under Vehicle (Lowest Point)	6" / 152.9 MM
Turning Diameter	48' / 14.63 M
Aux Port in Fuel Tank / Sending Unit	Standard

CHASSIS SPECIFICATIONS	SOL 2950
Chassis	Freightliner XBA chassis
Engine	Cummins 15B 6.76 Diesel
Engine Horse Power	240 @ 2600 RPM
Vehicle Top Speed	70 MPH
Torque	560 F / 165 @ 2600 RPM
Standard Axle Ratio	5:29:01
Battery / Group 31 (Alliance Batteries)	(2) Heavy Duty 1540 CCA
Electrical System Voltage	12V
Alternator / Leese-Neville (model #A0014944PA)	270 AMP / 12 V
Transmission	Allison B220 Heavy Duty 6 Speed
Transmission Cooler (Thermo Dynamics #22838)	Standard
Park Brake	Transmission Mount Drum
Oil Filter	Full Flow / Disposable Type
Air Cleaner	Ecolite Heavy Duty Canister Type
50 State Emissions	Standard
Radiator Manufacturer	Titan X / Aluminum
Radiator Part Number 1040410	Standard
Radiator Capacity	11 gallons

Radiator Fan Speed Control Type	Electric Clutch
Engine Thermostat Temp Setting	190 Degrees
Overheat Alarm Temp Setting	225 Degrees
Power Port (1) 12 V	Standard
Radiator / rear DS Mount	741 sq/in Aluminum Side Mount
Transmission Ratio / 1st Gear 3.1, 2nd Gear 1/81 3rd Gear 141, 4th Gear 1.00, 5th Gear .71, 6th Gear .61	Standard
Transmission Ratio Reverse - 4.49	Standard
Transmission Shifter	Electronic 6 Speed
Starter Motor (Delco 29MT Part #82200571)	Standard
Fuel Type	Diesel
Rear Drive Axle Model	Detroit / Model # 19K 2N
Rear Axle Ratio	5:13:01
Front Drop Axle Model	Meritor / Model MFS 10
Shocks	Sachs
Wheels (Accuride #50/80)	19.5" x 6.5"
Tires	Michelin 245 / 70 R 19.5
Tire Type	XZE
Load Range	H
Min. Max. PSI	75 psi / 517 kpa -- 120psi / 830 kpa
Max Load Range (Single)	4940lbs @ 120psi / 2240kg @ 830kpa
Max Load Range (Dual)	4675lbs @ 120psi / 2120kg @ 830kpa
C/S & R/S Fuel Fills Available	Standard
Lug Nut Count	8
Approx. Wheel Weight	59lbs
Wheel Offset (in)	5.60" / 142.23 mm
Installed Valve	TR575
Dual Rear Wheels	Standard
Horn / Dual Note Tone	Standard
Tilt Steering Wheel	Optional
Power Steering	Hydraulic w/ TRW Steering Gear
Power Steering Pump TRW Model EV181619L10101)	Standard
Brakes, Hydraulic Actuated Disc w/Anti-lock	Standard
Front Hydraulic Brakes / Disc	Bosch 66mm
Rear Hydraulic Brakes / Disc	Bosch 73mm
Exhaust system shall be equipped with a heavy duty, corrosion resistant exhaust system which meets or exceeds FMVSS and EPA noise level and exhaust emission (smoke and noxious gas) requirements. Exhaust hangers shall be standard equipment and shall be welded to the frame. Exhaust Ubolts shall be used in connections with thread orientation must be directed instead of welded. Exhaust hangers will be bolted to frame on our side upwards.	Standard
Suspension System	Dual Air Springs @ each Axle w/Electronic Height Control
Driver's Hvac	Dual Mount w/Overhead Aux. Heater Standard
Traction Control	N/A

Air Compressor / (Twin Cylinder 37.4 CFM)	Cummins Internal Engine Driven Dual Piston Air Compressor
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VEHICLE BODY SPECIFICATIONS	SOL 2950
Altoona Tested 7yr 200,000 miles	Standard
FMVSS 220 Tested	Standard
Steel Cage Construction w/E-Coating 1500hr. Salt Spray	Standard
Bus Equipped w/ Kneel Feature	Standard
1:6 Ramp Angle	Standard
ADA Compliant	Standard
Door Drive Machine	12v Mechanical Gear Drive STD.
Dual Panels w/Full Length Window	Standard
Door Clear Opening	36" x 82"
Door Sensetive Edge	Optional
Entry Door @ 5th Angle to Assist with Access	Standard
Steel Structre of Walls Extends Below Floor	Standard
Bumpjer / Steel Painted Black	Standard
Bumper / Energy Absorbing	Optional
Day Time Running Lights	Standard
Driver's Side Sun Visor	Standard
Lighting / All LED	Standard
Back up Alarm	Standard

Rev. 5/22/14 in red

SPL 3400

25,900# / 11748kg

10,000# / 4536kg

17,500# / 7938kg

N/A

202 1/2" / 5.143 M

34" 0" / 10.36 M

34' 10" / 10.61 M

9*

8.7*

10*

120" / 3.04 M

100" / 2.54 M

121.5" / 3.08 M

85" / 2.08 M

79" / 2.00 M

97" / 2.46 M

12.5" / 317.5 MM

10" / 254 MM

70 gal / 265 L

85" / 2159 MM

89.75" / 2274 MM

94.75" / 2406 MM

115.93" / 2944 MM

120.93" / 3071 MM

6" / 152.9 MM

59' 2" / 18.03 M

Standard

SPL 3400

Freightliner XBA chassis

Cummins 15B 6.76 Diesel

240 @ 2600 RPM

70 MPH

560 F / 165 @ 2600 RPM

5:29:01

(2) Heavy Duty 1540 CCA

12V

270 AMP / 12 V

Allison B220 Heavy Duty 6 Speed

Standard

Transmission Mount Drum

Full Flow / Disposable Type

Ecolite Heavy Duty Canister Type

Standard

Titan X / Aluminum

Standard

11 gallons

Electric Clutch
190 Degrees
225 Degrees
Standard
741 sq/in Aluminum Side Mount
Standard
Standard
Electronic 6 Speed
Standard
Diesel
Detroit / Model # 19K 2N
5:13:01
Meritor / Model MFS 10
Sachs
19.5" x 6.5"
Michelin 245 / 70 R 19.5
XZE
H
75 psi / 517 kpa -- 120psi / 830 kpa
4940lbs @ 120psi / 2240kg @ 830kpa
4675lbs @ 120psi / 2120kg @ 830kpa
Standard
8
59lbs
5.60" / 142.23 mm
TR575
Standard
Standard
Optional
Hydrolic w/ TRW Steering Gear
Standard
Standard
Bosch 66mm
Bosch 73mm
Standard
Dual Air Springs @ each Axle w/Electronic Height Control
Dual Mount w/Overhead Aux. Heater
Standard
N/A

Cummins Internal Engine Driven Dual Piston Air Compressor
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SPL 3400
Standard
Standard
Standard
Standard
Standard
Standard
Standard
12v Mechanical Gear Drive STD.
Standard
36" x 82"
Optional
Standard
Standard
Standard
Optional
Standard
Standard
Standard
Standard

CONSTRUCTION SPECIFICATIONS

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ARBOC SPECIALTY VEHICLES, LLC ® Low Floor Commercial Bus

1.0 SCOPE: MID-SIZE LOW FLOOR BUS

- 1.1 This specification describes a steel cage, low floor, commercial bus designed for use in Tour, Charter, Shuttle, and other Commercial or Transit applications that meets all the requirements of ADA and the FMVSS and CMVSS Safety Standards in effect at the time of manufacture.
- 1.2 The proposed bus must have been tested at the Federal Bus Testing center at Altoona, PA in the 7 year/200,000 mile category.
- 1.3 The bus provided must be built on a Freightliner XBA Chassis. Other chassis' will not be accepted.
- 1.4 The bus must meet all the chassis specifications listed in Section 9.1.

2.0 PURPOSE:

- 2.1 The purpose of these specifications is to describe a Mid-size bus suitable for transporting both ambulatory and non-ambulatory passengers in both rural and urban areas.
- 2.2 This vehicle is not a School Bus and is not intended to transport children to or from school.
- 2.3 The bus will be of a "Steel Cage" type construction with FRP (Fiber Reinforced Plastic) Composite skin laminated to a moisture resistant (less than 1%) substrate (not Luan) attached to the steel cage with urethane adhesive. The roof will consist of a single piece FRP skin laminated to the substrate and roof steel with urethane adhesive. The bus body is constructed of welded walls, sub floors, roof framing, and rear steel structure which are bonded and bolted together, forming an integrated steel cage around the passenger area.

3.0 CLASSIFICATION: MID SIZE LOW FLOOR BUS:

- 3.1 This specification is for a Mid Size Low Floor Commercial bus of the "Body-on-Chassis" type.
- 3.2 The bus shall meet all requirements of the Americans With Disabilities Act even though the specific items may not be listed in detail in this specification.
- 3.3 The bus shall be of the Low Floor type with air suspension both front and rear.
- 3.4 The bus shall have a kneeling feature to lower the bus to meet 1:6 angle when ramp is deployed.

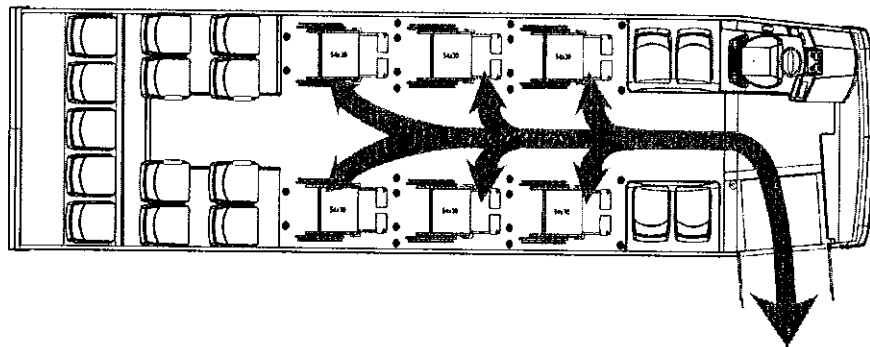
4.0 EXCEPTIONS TO SPECIFICATIONS:

- 4.1 Manufacturers of similar equipment of the type specified may submit requests for approved equals provided that the bus is built on the identical chassis specified and that they have produced this model in commercial quantities. Manufacturers of similar buses must be able to provide a list of current users of the proposed bus as references.

- 4.2 Manufacturers requesting any deviation from these specifications must provide actual test results supporting their claim.
- 4.3 Such requests must be accompanied by test reports and other evidence showing that the proposed product meets or exceeds the requirements of these specifications.
- 4.4 Any tests submitted to support a request for approved equal must have been performed by an Independent Professional Engineering Company and certified by a Licensed Professional Engineer.
- 4.5 This specification reflects the specific needs of this organization/agency. In order to standardize certain components, therefore, we have named specific brands of equipment. This has been done to establish a certain standard of quality and to standardize inventory of replacement parts.
- 4.6 Other brands will not be considered, as the brands specified are readily available and have been proven in Transit/Shuttle service.

5.0 ITEMS NOT ELIGIBLE FOR EXCEPTIONS:

- 5.1 There are several items in the specification that will not be considered for any deviation:
 - 5.1.1 1. The chassis must be a Freightliner XBA Chassis in accordance with the chassis specifications listed.
 - 5.1.2 2. The Passenger door must be dual panel, outward opening electrically operated with one full length window in each panel. The windows shall have a minimum of 15.5" wide and 74" high visible viewing area.
 - 5.1.3 3. The entry door must be on a 5 degree angle to provide random access for wheelchair loading and unloading.



- 5.1.4 4. The entry door must be forward of the front axle and in direct line of sight with driver to assist in seeing the passenger entry.
- 5.1.5 5. The Exterior skin must be FRP (Fiber Reinforced Plastic) Composite skin Laminated to a moisture resistant substrate (less than 1% absorption) attached to the steel cage with urethane adhesive. No Luan is permitted in the sidewalls or rear end wall of the bus. Laminated constructions with Luan or other wood materials are not allowed as they can lead to corrosion of the skin due to the wicking of moisture into the wood material.

- 5.1.6 6. The steel cage must be Electro-coated (Cathodic 'Military Spec' E-coating to 1500 hour salt spray test) after fabrication, prior to final assembly.
- 5.1.7 7. The steel structure of the walls must extend below the floor level and continue to the lowest part of the bus. Separate skirting that only serves a decorative purpose is not allowed; every part of the sidewall must have the steel cage structure behind the exterior skin.
- 5.1.8 8. The overall exterior width, excluding mirrors, of the bus must be a nominal 100" wide as narrower buses do not allow sufficient space for wheelchair maneuverability.
- 5.2 Any exceptions approved will be in writing and will be distributed to all prospective bidders and other interested parties. The approval, if granted, shall extend to all bidders and not just to the bidder who made the request.
- 5.3 Manufacturer must carry a minimum of \$50,000,000 in product liability insurance.

6.0 MATERIALS

- 6.1 All materials used in conversion of the bus shall be new and unused; returned or reconditioned components will not be accepted. Brand names and part/model numbers of the major components will be listed and must comply with the brands and models specified in these specifications.
- 6.2 Major components include but are not limited to Seats, Windows, W/C ramps, W/C Tie downs, Air Conditioning/ Heat, Flooring, Floor Covering, Entry Door, and Chassis.

7.0 WARRANTY

- 7.1 The manufacturer of this vehicle will provide a Warranty of 3 year or 36,000 miles parts and labor. The body structure shall be warranted for a period of five (5) years and 100,000 miles.
- 7.2 Chassis Warranty provided by Freightliner Custom Chassis for 3 years or 50,000 miles whichever comes first and 3 years or 50,000 on the drivetrain. Refer to Freightliner Owners Manual for complete coverage.
- 7.3 The major subcomponents, including but not limited to, the Wheelchair Ramp, the Wheelchair Tie Downs, and the optional rear Air Conditioning Systems are warranted by the manufacturer of that component. Detailed Warranty coverage shall be provided with each bus. Trans Air conditioning systems are warranted for 3 years and unlimited mileage.
- 7.4 The Electrical System will be warranted for 3 Years or 36,000 miles parts and labor.

8.0 GENERAL INFORMATION:

8.1.0 DIMENSIONS

- 8.1.1 Exterior Width: 100" maximum excluding mirrors

- 8.1.2 Interior Width: 96" minimum
- 8.1.3 Interior Height: 77" minimum at the rear of bus and 85" at the front of bus when measured at center aisle (Rear interior height varies with bus length)
- 8.1.4 Exterior Height: 120" maximum excluding roof hatch or roof mounted A/C units
- 8.1.5 Rear Overhang: Less than 33% of the overall bus length

8.2.0 BASE MODELS

- 8.2.1 SOL 2950 150" WB/30'-0" Overall Length Diesel 25,900 GVWR
- 8.2.2 SOL 3400 202.5" WB/35'-0" Overall Length Diesel 25,900 GVWR

8.3.0 PASSENGER SEATS AND CAPACITY

- 8.3.1 Seating Capacity: 1-37 passengers (Passenger weight based on Federal Guidelines)
- 8.3.2 Wheelchair Positions: 1-6 (dependent upon wheelbase and seat configuration) with minimum of 54 inches.
- 8.3.3 Seated Knee Room Forward: 28" minimum
- 8.3.4 Seated Width per Seat: 17" (wider seats optional)
- 8.3.5 Cushion Height above finished floor: 17-1/2" minimum/18-1/2" maximum
- 8.3.6 Minimum Aisle: 18" standard (options may affect aisle width)

9.0.0 CONSTRUCTION AND SPECIFICATIONS:

9.1.0 FREIGHTLINER XBA LOW FLOOR RAIL CHASSIS

- 9.1.1 Engine: Cummins ISB 6.7L/240 HP Diesel Engine
- 9.1.2 Base Transmission: Allison B220 Heavy Duty 6-Speed Automatic with Transmission Cooler
- 9.1.3 Horsepower: 240 at 560 FT/LBS.
- 9.1.4 Torque FT/LBS at RPM: 560 at 2,600 RPM
- 9.1.5 Standard Axle Ratio: 5:13:1 (Diesel)
- 9.1.6 Fuel System: Turbo Diesel
- 9.1.7 Battery: (2) Heavy Duty 1540 CCA
- 9.1.8 Alternator: 270-amp/12 V
- 9.1.9 GVWR Standard: 25,900
- 9.1.10 GVWR Front Axle: 10,000
- 9.1.11 GVWR Rear Axle: 17,500

- 9.1.12 Fuel Tank: 70 Gallon tank mid-ship between the frame rails. Curbside Fill (Optional Roadside Fill).
- 9.1.13 Tires: 245/70Rx19.5 G Rated on Accuride 19.5" x 7.5" Steel Powder Coated White Rims
- 9.1.14 Dual Rear Wheels
- 9.1.15 Brakes: Hydraulic Actuated Heavy Duty Disc Brakes with four-wheel anti-lock system
- 9.1.16 Park Brake: Transmission Mount/Drum Air Operated
- 9.1.17 Wheel Base Availability: 150 and 202.5 inches
- 9.1.18 Full-Flow Oil Filter (Disposable Type)
- 9.1.19 The Frame shall be ladder construction w/rails constructed of high strength steel. Main rail configuration shall be C-Channel w/3" flange and minimum section height of 8".
- 9.1.20 Power Steering: Hydraulic
- 9.1.21 Tilt Steering Wheel
- 9.1.22 Cruise Control- Electronic
- 9.1.23 Horn: Dual Note Tone
- 9.1.24 Air Cleaner: Heavy Duty ECOLITE canister type
- 9.1.25 Driver Side Sun Visor
- 9.1.26 50 State Emissions
- 9.1.27 Power Port: (1) 12 Volt
- 9.1.28 Daytime Running Lights
- 9.1.29 Exhaust system shall be equipped with a heavy duty, corrosion resistant exhaust system which meets or exceeds FMVSS and EPA noise level and exhaust emission (smoke and noxious gas) requirements. Exhaust hangers shall be standard equipment and shall be bolted to the frame. Exhaust U-bolts shall be used in connections with thread orientation must be directed upwards.
- 9.1.30 Dedicated Drivers A/C, Defroster, and Heat
- 9.1.31 Low Oil Pressure Light
- 9.1.32 High Engine Coolant Temperature
- 9.1.33 Power Steering
- 9.1.34 Service Center Box includes Dual Batteries, Emergency Schrader Air Valve, Rotary Electrical Disconnect Switch, and Fuel/Water Separator

9.2.0 BUMPERS

- 9.2.1 Bumpers shall be steel and powder coated black. Optional Front and Rear Energy Absorbing Bumpers are available.

9.3.0 SUSPENSION

- 9.3.1 All chassis shall be equipped with Air Suspension System powered by Cummins internal engine driven dual piston air compressor.
- 9.3.3 System is equipped with a suspension status LED and buzzer which will flash at 1Hz to indicate an error in the system.
- 9.3.4 When stopping for non-wheelchair passengers, operators may choose to maintain the vehicle at its normal ride height condition.
- 9.3.5 If Driver chooses to kneel the bus, the kneel sequence is as follows:
- 9.3.5.1 • Driver pulls into position, places the vehicle transmission shifter in the park position, and engages the emergency brake.
- 9.3.5.2 • Driver opens door by pressing and holding open door switch until door is fully opened (interior passenger lights turn on when door is fully open).
Driver then presses the "One-Touch" Kneel Switch.
- 9.3.5.2A • Door open limit switch sends signal to the suspension controller to kneel the front.
- 9.3.5.2B • The front of the vehicle kneels.
- 9.3.5.3 • Driver then deploys the ramp by pressing/holding ramp deploy switch until ramp is fully deployed.
- 9.3.5.3A • Ramp deploy switch sends a signal to the suspension controller to fully kneel the vehicle.
- 9.3.5.3B • Full kneel drops the vehicle to meet 1:6 angle.
- 9.3.5.4 • Once the ramp is stowed and the door is closed the suspension controller will raise the vehicle to the normal ride height.

9.4.0 FLOOR CONSTRUCTION

- 9.4.1 The front floor construction shall be made of a high strength composite material. This part shall be specifically designed to accommodate the wheel housings, drivers station, and entry door ramp areas. This floor sections shall be supported with rubber ride isolator supports with a ladder underlayment framing in the isle space as additional support for wheelchair traffic.
- 9.4.2 The center floor sections shall be a steel floor section. This floor shall have longitudinal formed steel sections made of 11 ga. Hot rolled steel. These longitudinal sections support the floor when mounted to the isolator mounts. The perimeter "C" channels which marry the floor assembly to the sidewall are made of 11 ga. Hot rolled steel.
- 9.4.3 Steel sub floor cross members shall be made of 2 x 2 structural steel tubes of 1/4" wall material.
- 9.4.4 Sides of the sub floor shall be 14 gauge C-Channel that will overlap the 1.5 x 2.5 x 16 gauge floor line tubing in the side walls.

- 9.4.5 The front floor section shall attach to the frame rails and firewall using rubber isolator supports, of adhesive and bolts.
- 9.4.6 The center floor decking shall be a 5/8" thick single piece of engineered wood with moisture barrier laminated to upper surface and moisture sealed edges.
- 9.4.7 Underside of floor decking shall be sprayed with a Poly-Urea coating prior to installation to the sub floors.
- 9.4.8 A sealant shall be used in body to floor corners to provide a water resistant seal as an aid in floor cleaning.
- 9.4.9 The cab cockpit floor will have a 16 gauge plate welded in place for future fare box installation.
- 9.4.10 The rear floor will be constructed of tube steel and wood decking.

9.5.0 WHEEL HOUSINGS

- 9.5.1 Ample clearance shall be provided for tires under load and operating on both smooth and rough terrain.
- 9.5.2 Black rubber wheel flares will be installed.
- 9.5.3 Front and rear mud flaps are standard.
- 9.5.4 Underside and top side of front wheel housings shall be coated with Poly Urea for corrosion and sound resistance.
- 9.5.5 Galvaneal Clad- Underside Rear Wheelwells

9.6.0 CURB SIDE WALL AND DRIVER SIDE WALL

- 9.6.1 Wall structure which ends at the floor line is not acceptable and lower skirts that are not an integral part of the side wall are not permitted. Steel structure must extend below the floor level to the lowest point in side wall.
- 9.6.2 There is (1) 1-1/2" x 2-1/2" horizontal 16 gauge steel tube at the top forming the edge of wall.
- 9.6.3 There is one row of 1-1/2" x 1-1/2" horizontal 16 gauge steel tube below the window line.
- 9.6.4 There is one row of 1-1/2" x 2-1/2" horizontal 16 gauge steel tube at the floor level.
- 9.6.5 There is one row of 14 gauge C-Channel at the top of the side wall
- 9.6.6 There is one row of 1-1/2" x 1-1/2" horizontal 16 gauge steel tube at the bottom forming the edge of the wall.
- 9.6.7 Vertical steel ribs consist of 1-1/2" x 2" 16 gauge steel tubes located at sides of each window.
- 9.6.8 (1) 1-1/2" x 1-1/2" 16 gauge steel tube is welded vertically at the midpoint of each window with a width greater than 24" connecting the horizontal tubes below window and the horizontal tube that is welded at the floor line

- 9.6.9 (2) 1-1/2" x 1-1/2" 16 gauge steel tubes are required at the front of the side wall to form the front and rear of the door opening.
- 9.6.10 The entire steel structure must be bonded (structural bonding adhesive) and bolted together. Any other method of assembly will not be accepted.
- 9.6.11 Exterior wall surface is White FRP Composite laminated to a moisture resistant (less than 1% absorption) substrate (not Luan) attached to the steel cage with urethane adhesive.
- 9.6.12 Interior wall surface is Grey FRP Composite laminated to a moisture resistant (less than 1% absorption) substrate (not Luan) attached to the steel cage with urethane adhesive. Options to replace include Nanocide (Grey), Auto Cloth (Grey) or Vinyl Soft Touch (Grey).
- 9.6.13 Luan used as a substrate is not permitted in the exterior or interior of the of the wall construction. Experience has shown that construction using Luan can lead to moisture wicking into the walls causing corrosion and delamination.

9.7.0 ROOF CONSTRUCTION

- 9.7.1 Roof Bows must be 1-1/2" x 1-1/2" 16 gauge tubes bent to the radius of the roof. Traditional roof bows with or without capped top covers are not allowed.
- 9.7.2 One row of 1-1/2" x 1-1/2" 16 gauge steel tubing will be installed to form the center longitudinal members front to rear of roof structure.
- 9.7.3 (1) 1-1/2" x 1-1/2" 16 gauge tube will be installed at bottom of roof bow on each side of roof structure.
- 9.7.4 The entire steel structure must be bonded (structural bonding adhesive) and bolted together. Any other method of assembly will not be accepted. The bottom tube of the roof assembly will be bonded and bolted into the rivnuts of the side wall upper C-Channel.
- 9.7.5 Exterior roof surface is Single Piece White FRP (Fiber Reinforced Plastic) Composite laminated to a moisture resistant (less than 1% absorption) substrate (not Luan) attached to the steel cage with urethane adhesive.
- 9.7.6 Exterior FRP (Fiber Reinforced Plastic) Composite will be secured to the side walls with the seam being covered by a rain gutter.
- 9.7.7 Exterior seams are only allowed at the junction of the front cap and rear cap. Any other seams on the exterior of the roof are not permitted.
- 9.7.8 Interior ceiling surface is Grey FRP Composite laminated to a moisture resistant (less than 1% absorption) substrate (not Luan) attached to the steel cage with urethane adhesive. Options to replace include Nanocide (Grey), Auto Cloth (Grey) or Vinyl Soft Touch (Grey).

9.8.0 PASSENGER ENTRY DOOR

- 9.8.1 Entry Door shall be a dual panel, swing out type door with two single piece, full-length glass windows.

- 9.8.2 Door Opening: 41" wide minimum clear opening (37" w/standard entry assist handles) and 79" high clear opening.
- 9.8.3 Door Windows Dimensions: 15.5" x 74" minimum (clear visible viewing space).
- 9.8.4 Entry doors shall incorporate gaskets and/or seals to provide a barrier against intrusion by wind, water, and dust around the perimeter. The seal at the center of the door shall be by means of full height overlapping rubber seals, and shall include a barrier or sweep at the bottom of both doors.
- 9.8.5 Passenger entry door shall function through the use of an electric door mechanism.
- 9.8.6 For emergency situations, a manual door release control shall be provided over the top of the door, and shall be designed to permit simple operations to override the electric door operator.
- 9.8.7 Standard operating for the passenger entry door will not allow the door opened when vehicle is traveling faster than 2 mph for safety.
- 9.8.8 Steps are not allowed as all passengers shall enter by way of passenger entry door.

9.9.0 MIRRORS

- 9.9.1 Interior 6" x 16" Flat Mirror shall be standard.
- 9.9.2 Two overhead exterior rear view 'Heated/Remote' mirrors shall be provided and mounted to view down each side of the bus as standard.

9.10.0 WINDOWS

- 9.10.1 Solid framed windows are standard. Optional T-Sliders available.
- 9.10.2 Interior window frames will be anodized black as standard.
- 9.10.3 Passenger windows shall be a minimum of 19" or 36" and 36" high.

9.11.0 EMERGENCY EXITS

- 9.11.1 Hinge-out windows shall be installed for emergency escape and shall comply with FMVSS-217.
- 9.11.2 Emergency Escape windows shall be clearly labeled and operation instructions shall be clearly visible at each escape window. The emergency release handle will meet FMVSS-217 requirements and shall not return to the locked position automatically; it shall require the driver or other authorized person to manually re-lock it. All emergency exits shall comply with F.A.C. 14-90.
- 9.11.3 Each emergency exit shall be identified with a 12 volt red LED lamp assembly, with a 10,000 hour life bulb, wired to the vehicle ignition circuit. Next to or immediately below each LED light fixture shall be a decal, one inch white letters on red background, stating "Emergency Exit".
- 9.11.4 There shall be a roof hatch in every vehicle.

9.12.0 ELECTRICAL

- 9.12.1 The vehicle shall be equipped with a heavy-duty (12 volt) electrical system. All components are to be selected and integrated to function in an environment characterized by low engine (alternator) speeds and high amperage draws due to lights, air compressor, wheelchair ramp, 4-way flashers, air conditioning/heater, and other accessories in constant operation.
- 9.12.2 The vehicle shall be equipped with a rotary disconnect switch that removes 12V battery power from all loads except for ECU (Engine Control Unit) & TCM (Transmission Control Module) Memory.
- 9.12.3 A fast idle system shall be installed which will automatically increase the engine speed (RPM) to approximately 1200 RPM on diesel engines. The fast speed idle shall engage only when the vehicle is in Park and the parking brake applied.
- 9.12.4 The vehicle shall be equipped with a backup alarm.
- 9.12.5 The vehicle shall be equipped with an Internal Engine Driven Dual Piston Compressor System with an Air Pressure Gauge with Buzzer mounted on the OEM dash, air dryer control system, and diagnostic module.
- 9.12.6 The vehicle shall be equipped with an Exterior Door Keyed Switch.
- 9.12.7 The vehicle shall be equipped with a Ramp Activation System that includes Exterior Ramp Toggle Switch.
- 9.12.8 The vehicle shall be equipped with a driver console with switch panel that includes (6) available spaces for switches that includes but not limited to entry door, ramp, and interior lights.
- 9.12.9 The interior passenger area shall be equipped with LED Surface Lights. The SOL 2950 will have 8 lights (4 drivers side/4 passenger). The SOL 3400 will have 10 lights (5 driver/5 passenger).
- 9.12.10 The ramp area shall be equipped with (1) exterior overhead door light and (2) LED Stepwell Lights to illuminate the entry floor/ramp platform meeting ADA specs. These lights shall activate when the doors open and will turn off when doors close.
- 9.12.11 The driver's seat and instrument panel area shall have a flush-mounted ceiling light to provide general illumination. The light shall be controlled by the operator through a switch on the front console and shall illuminate without ignition activation.
- 9.12.12 The vehicle shall be equipped with center-top mounted third brake light, tail brake lights, rear turn signals, back-up lights, and state license tag lights shall be LED fixtures.
- 9.12.13 All wiring shall be SXL/GXL and be sized to minimize voltage drop at full load.

- 9.12.14 Entire harness system and mating electrical components are plug-connected with lock tab connectors; all terminals are machine crimped; all harnesses shall be covered in high temp conduit and all exterior under body/under hood connectors are IP67 rated sealed connectors.
- 9.12.15 All body wiring shall be run inside the body in a protected area. All wiring shall be in a loom and secured for maximum protection. Clamps shall be rubber or plastic coated to prevent them from cutting the wiring insulation.
- 9.12.16 When routing wiring under vehicle all wiring shall be encased in a loom and attached to the frame and sub-floor structure with proper fasteners and shall not be bundled with hoses. The harness shall run in straight lines as close to chassis frame rails as possible.
- 9.12.17 All fuses and relays (other than chassis OEM) shall be placed in an Electrical Panel. The panel shall be accessible through a non-locking door. Connection to OEM electrical system shall be accomplished through connectors supplied by chassis manufacturer using locking mating connectors. A legend shall be provided in an accessible location that displays circuit fusing and identification information.

9.13.0 GRAB RAILS AND STANCHIONS

- 9.13.1 Handrails and stanchions shall be provided in the entrance of the vehicle including:
 - 9.13.1A • LH Entry Stanchion Stainless Steel with Modesty Panel. Fastening of the panel shall be by bolts - screws will not be acceptable. The front side of the stanchion shall include a handle for boarding and aligned with entry door grab handles.
 - 9.13.1B • Entry Door Handles Stainless Steel mounted parallel to interior handles.
 - 9.13.1C • RH Entry Stanchion Stainless Steel.
 - 9.13.1D • OH Ceiling Grab Rails - Stainless Steel.

9.14.0 SEATING

- 9.14.1 Driver Seat: USSC Driver Seat w/Manual Base. OPTIONAL Power Seat Base.
- 9.14.2 Seats shall be installed such that they provide "theater" seating in that rows of seats in the rear of the bus shall be higher than the seats in the front of the bus.
- 9.14.3 Seats shall be bolted directly to the floor/steel structure to provide clean floor surfaces without breaks in the floor seal.

9.15.0 PASSENGER ENTRY RAMP

- 9.15.1 The entry ramp shall be bi-fold power ramp that is designed to let wheelchair and ambulatory passengers enter the bus once the ramp is fully deployed.
- 9.15.2 Entry ramp shall be rated at a 800 pound maximum.

- 9.15.3 Entry ramp shall be 62 inches minimum and provide a 1:6 angle when deployed to the ground with bus in knelt position.
- 9.15.4 Steps are not allowed inside the entryway and all passengers shall enter by way of passenger door.

9.16.0 SAFETY EQUIPMENT

- 9.16.1 Every unit to include a Standee Line with a sign and Warning Lines on rear foot riser.