

CITY OF MILWAUKEE DEPARTMENT OF PUBLIC WORKS
Request for Proposals: Milwaukee Streetcar Project - Vehicle Procurement
Official Notice # 70-2015

ADDENDUM No. 3

June 2, 2015

Tracking No. 1-005

Section B-2: Overall Vehicle Description

B-2.1 General Arrangement Drawings

- Provide six (6) general arrangement drawings to scale with appropriate dimensions that indicate the following:
 - Vehicle Plan View (external)
 - Vehicle Side View (external)
 - Vehicle Front View (external)
 - Vehicle Roof Equipment Arrangement (external)
 - Vehicle Seating and Cab Arrangement (internal plan view)
 - Vehicle Underframe Equipment Arrangement

- Provide five (5) transverse sections at the following locations:
 - High floor section (if applicable)
 - Low floor section end side door (if applicable)
 - Low floor section between side doors
 - Low floor section center side door
 - Low floor center section

- Provide artist renderings of the interior and exterior of the vehicle:
 - Exterior end view
 - Exterior side view
 - Exterior side view with doors open
 - Interior view of low floor area
 - Interior view of high floor area, if provided

B-2.2 This Section Not Used

Tracking No. 1-009

1.17 Proposer's Checklist

The following two checklists identify the Proposal Forms that MUST be submitted as part of any responsive Proposal. The forms are included in Volume I, Commercial Provisions, Section 5, Forms and Certificates.

Proposers are advised that said listings are provided as a convenience only for Proposal preparation and the City does not warrant that all data required for submittal are listed.

Part A – PRICING INFORMATION	
A.1	Schedule of Prices
	Price Summary Form
	Schedule A – System Support
	Schedule B – Spare Parts
	Schedule C – Special Tools <u>& Test Equipment</u>
	Schedule D – Test Equipment
A.2	Proposal Security Form
A.3	Pre-Award Audit Form for Contractors
A.4	Pre-Award Audit Form for Subcontractors

Tracking No. 1-024

2.30 ~~Conservation~~ This Section Not Used

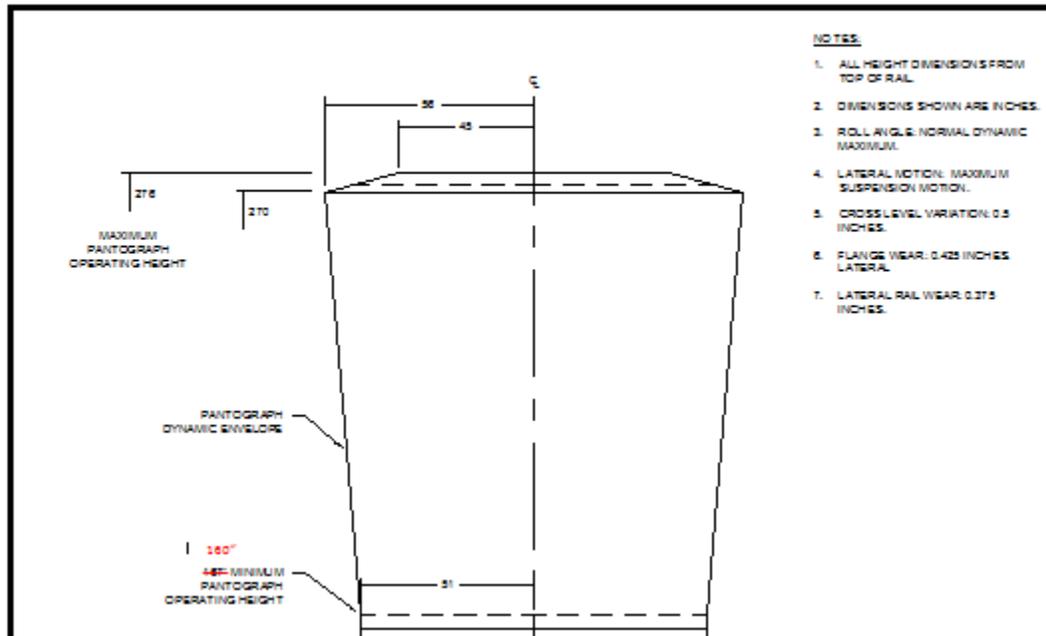
~~Contractor shall recognize mandatory standards and policies relating to energy efficiency that are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (42 USC Section 6321 et seq.).~~

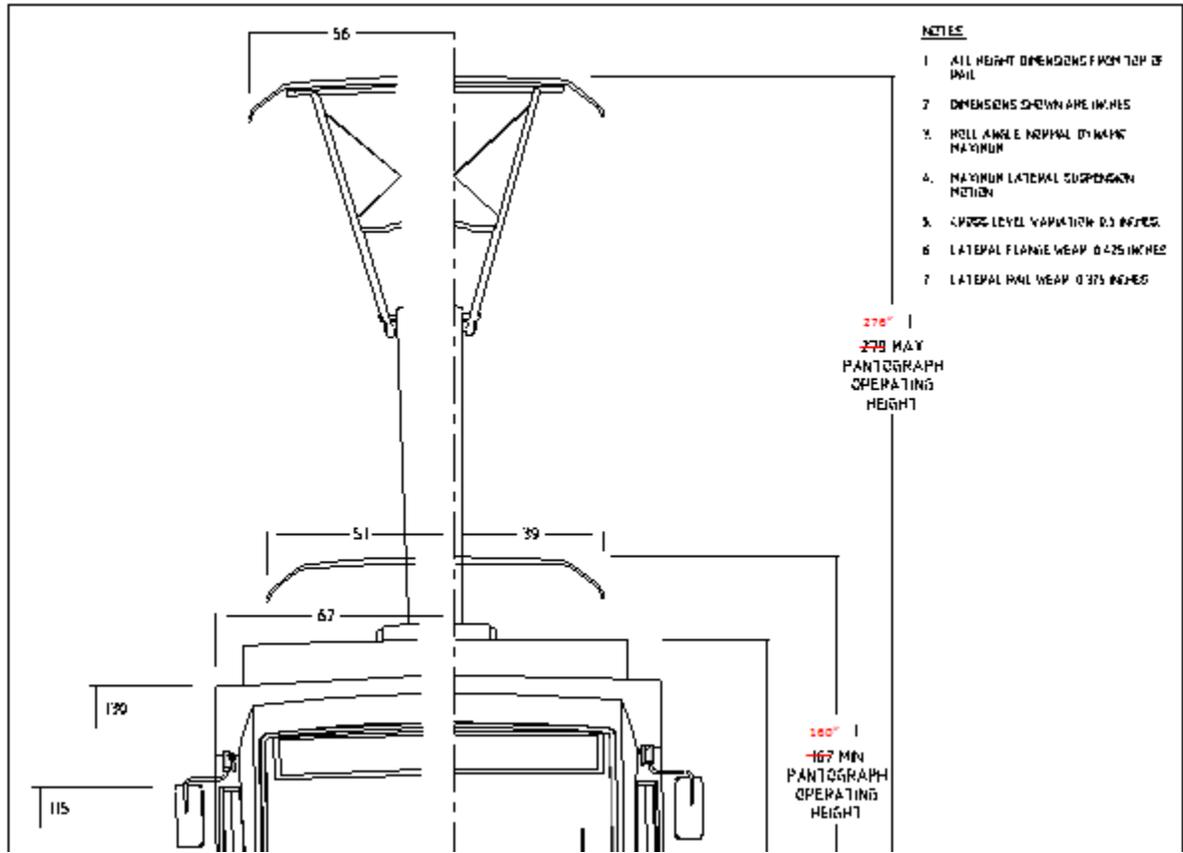
Tracking No. 2-016, 2-017, 2-018 & 2-019

2.4.6 Pantograph Dimensions

Maximum height above TOR in the lockdown position, new wheels, vehicle at AW0 passenger weight	3800-3960 mm (150-156 in)
Pantograph operating height under dynamic conditions, vehicle weight from AW0 to AW3, and with new to fully worn wheels	
Minimum Height	3950-4060 mm (156-160 in)
Maximum Height	6250-7010 mm (246-276 in)
Maximum collector width over horns	1980 mm (78 in)
Minimum carbon shoe length	1050 mm (41 in)
Maximum longitudinal distance from truck centerline to center of pantograph shoe, locked down	1275 mm (50 in)

Figure 2-1, Dynamic Envelope





Tracking No. 2-021, 2-022, 2-023 & 2-024

2.7.7.2 Service Brake

Service braking efforts shall be provided by dynamic and friction disk braking. At all all-vehicle weights up to AW3, service braking shall be 100% dynamic braking down to the dynamic brake fade point. At vehicle weights greater than AW3 and entry speeds greater than 65 km/h, brake blending may be used. (see Section 10, Propulsion System and Control)-

Tracking No. 2-027

2.7.7.3 Maximum Brake

The MB position on the MC shall provide an average brake rate, as measured by the brake entry speed divided by stopping time, or 2.25 m/s² minus 0% / plus 30%, from any speed to zero, for all-all vehicle weights up to AW3.

Maximum brake shall be provided by track brakes plus the maximum available dynamic braking, augmented as necessary by friction disk braking to achieve specified performance.

Tracking No. 2-029

2.7.7.4 Emergency Brake

Operator control of emergency braking shall be provided by an Emergency Brake Switch as specified in Section 5, Operator's Cab.

Emergency braking shall be a combination of friction disc brakes, track brakes, dynamic brakes, and the application of sand:

1. At AW0, the minimum emergency brake rate shall be achieved independently of dynamic braking, using friction disc brakes, track brakes and the application of sand.
2. At vehicle weights above AW0, dynamic brakes may supplement the friction disc brakes, track brakes and application of sand, so the minimum emergency brake rate can be achieved.

Emergency braking shall function and perform as follows:

1. The minimum emergency braking performance requirement is 2.25 m/s^2 , average, from any speed to zero, for ~~all~~ all vehicle weights up to AW3.
2. The spin-slide system shall be cut out during emergency braking.
3. Emergency braking shall not be jerk limited, and shall not be inhibited by the state of other vehicle systems.

Tracking No. 2-054

5.5 Foot Switches

Provide either a hand switch or a footswitch for manual operation of the sander system. The switch shall be of the momentary, spring-loaded type.

Tracking No. 2-056 & 2-057

7.5.3 Temperature Variation

Vehicle interior temperatures shall be uniform. During steady-state operation, interior temperature variation shall not exceed the following:

1. Between points in same horizontal plane of each passenger compartment: Maximum ~~2-3~~ degrees C (~~3-65.4~~ degrees F);
2. Between any point 100 mm (4 in) above the floor to 1700 mm (67 in) above the floor in a vertical plane: Maximum ~~3-4~~ degrees C (~~5-47.2~~ degrees F).

Tracking No. 2-062

8.7 Exterior Lighting

8.7.1 General

Exterior lighting assemblies shall be inherently waterproof, and shall be mounted to the vehicle with gaskets to prevent water ingress into the vehicle. Caulks, sealers, and similar materials are prohibited.

Bezels and trim, if provided, shall be stainless steel, have captive stainless steel fasteners, and be consistent with good mechanical mounting principles. Plastic bezels and trim may be considered providing they meet industry standards and are of a proven design.

Taillights, stop lights, marker lights, and turn signals shall be permanently sealed plastic LED assemblies, colored as indicated.

Headlights, taillights, stoplights, marker and clearance lights, and turn signals shall conform to 49 CFR 571.108 for vehicles of 2032 mm (80 inches) or more in overall width.

Automatic control of exterior lights is specified in Section 5, Operator's Cab.

Tracking No. 2-063, 2-064 & 2-065

8.7.2 Headlights

Provide two replaceable-bulb halogen headlamps meeting the requirements of SAE J2560, one for high beam and one for low beam, on each side of each end of the vehicle. Lamps shall be standard 28 V truck/bus lamps. A single halogen headlamp containing both high and low beams may be considered providing they meet the illumination requirements and voltage requirements.

The headlights shall be adjustable to permit proper aiming of the beams.

Operate the low beams at reduced voltage for use as daytime running lights.

Confer with the lamp manufacture regarding operating halogen lamps at reduced voltage. If not advised, provide a non-halogen incandescent lamp for the low beam lamp.

Set the lamp voltage to provide 25,000 hours of operation.

Voltage reduction shall be via an adjustable dc-dc converter driving both lamps, or via a dropping resistor for each lamp. Provide adequate heat sink for the resistors to maintain allowed temperature under worst case ambient and compartment ventilation. Provide physical barriers to prevent resistor or heat sink contact by personnel.

Tracking No. 2-066

8.7.4 Tail Lights and Stop Lights

Provide two red taillights meeting the requirements of SAE J2040 at each end of each vehicle. When illuminated, the taillights shall be plainly visible from a distance of minimum 150 m (492 ft).

Provide two stop lights meeting the requirements of SAE J2261 at each end of each vehicle.

Two combined Tail/Stop lights may be considered providing they meet the other requirements.

Tracking No. 2-071

9.4 Maintenance Shop Power

9.4.1 General

Shop power will be either 750 Vdc or 208 Vac 60Hz, supplied by a plug-in cable from the Shop Vehicle Power Unit (SVPU), provided by others. When the SVPU is connected to the vehicle, the specified auxiliary loads shall be energized. Under no circumstances shall the propulsion system, pantograph, or pantograph frame be energized by shop power.

Tracking No. 2-073



3. Install the breaker in, or adjacent to, the battery box. Provide an explosion-proof breaker if mounted in the battery box, or a non-explosion-proof breaker located in an electrical enclosure away from the battery box. If installed away from the battery box, cables between battery and breaker shall be less than 2 m (6.5 ft) in length, and shall be protected against mechanical damage and potential shorts to the vehicle structure.
4. Include provision to manually trip the breaker from the side of the vehicle, by persons standing on the ground.

Provide a fire alarm system for heat or heat and smoke detection:

1. It shall trip the battery circuit breaker upon detection of excessive heat or heat and smoke.
2. The temperature setting shall be as recommended by the battery manufacturer.

Provide an accessible emergency battery-cutoff switch if the battery circuit breaker is not accessible from the side of the vehicle or at a convenient interior location.

Tracking No. 2-077

10.5.2.2 Dynamic Braking

Dynamic braking shall be combined regenerative and rheostatic and shall be continuously available from maximum vehicle speed down to a vehicle speed of ~~5-8~~ km/h (~~3-5~~ mph) or less. At zero speed, friction brakes shall be fully blended in to provide a secure zero speed detection.

The dynamic brake control system shall continuously monitor line voltage, shall supply to the line the maximum amount of energy possible within the line-voltage limits prescribed in Section 2, and shall divert to the braking resistors only that generated energy in excess of the energy accepted by the line.

Once initiated, dynamic braking shall be available independent of the presence of line voltage.

Provide a per-truck dynamic brake effort signal to the friction brake system, indicating achieved dynamic brake effort. Coordinate signal characteristics and values with the friction brake supplier.

It shall be possible to cut out regenerative braking by PTU for test purposes.

Tracking No. 2-076

10.3 Transients and EMI

10.3.1 Switching Line Transients

Suppress switching line transients normally generated by the propulsion system such that the instantaneous voltage complies with IEC 60850. EN 50163 standard may be an acceptable alternative.

Tracking No. 2-084

11. Bearings:

- a. Provide grease lubricated, NFL, antifriction bearings. Grease cavities shall be large enough to hold a 5-year supply of lubricant. Configurations are acceptable that use gear lubricant for the traction motor bearing at the pinion end. Bearings shall have an ABMA



L10 rating life equivalent to ~~1,600,000~~1,500,000 km (~~994,200~~932,055 mi) of service, or greater.

Tracking No. 2-087

11.3.3.2 Load Leveling

An adjustable hydraulic suspension system shall keep the vehicle floor level, and maintain the door threshold height above top-of-rail to the value and tolerance specified in Section 2, Design and Performance Criteria.

Provide **a minimum of** two hydraulic cylinders per truck, serving as the secondary suspension elements in conjunction with or instead of coil springs. Vertical damping may be provided by the leveling cylinders, or by separate dampers.

Tracking No. 2-111

13.10.3 APC Logic Unit

Provide an APC Logic Unit to collect, process, and store the data from the APC doorway equipment. It shall determine the position of the vehicle by a combination of the following:

1. Starting location information from the APIS
2. Distance traveled information from the propulsion system or VCU
3. No-motion as indicated by the vehicle no-motion logic

Tracking No. 2-147

18.2.2 Portable Test Units (PTUs)

PTUs (laptop computers) for on-board diagnostics are specified in Section 17, Electronic Controls, Software, and MDS. Furnish ~~three~~ one PTU's per vehicle furnished.

Laptop software shall not be copy-protected, shall not require external validating devices such as "dongles", and shall be freely copied by The City onto The City's computers. Furnish software licenses and back-up copies of all PTU software to The City.

Furnish with each unit all connectors, cables, and adapters necessary to communicate with on-board systems from the PTU.