MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: Holders of Contract Documents

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 7**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul
**"CANCELLATION & REJECTION OF BID NOTICE"**

DATE: September 30, 2013

You are hereby notified that the Maryland Transit Administration ("MTA") has determined it to be in the State's best interest to cancel the above reference Requests for Proposals (RFP"). Therefore, this procurement is cancelled in its entirety.

On behalf of the MTA, thank you for your interest in this RFP solicitation. The MTA wishes to encourage you to consider bidding on contracts of this type that may be solicited in the future.

Sincerely,

Heidi J. Tarleton
Procurement Officer

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 6**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: July 12, 2013

Enclosed and effective this date is Addendum No.6 to the subject Contract. This Addendum reflects changes made to the solicitation as mentioned on the attached list and includes responses to Planholder's written questions in Addendum No. 6 - Attachment A.

The proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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Acknowledgement of receipt of ADDENDUM #6 to Solicitation #T-8000-0399

Vendor Name: _____

_____ _____
Authorized Representative's Signature Date

**A list of the changes made to this solicitation follows:**

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Contract Specifications | | |
|---|---|---|
| **Item No. (Referenced #)** | **Page or Section** | **Modification** |
| | **Section I Solicitation Instructions** | One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m**. local time, ~~July 24, 2013~~ **September 9, 2013**, addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>~~1331 S. Monroe Street, 2nd Floor~~<br>~~Baltimore, Maryland 21230~~<br>**6 St. Paul, 7th Floor**<br>**Baltimore, MD 21202** |
| One<br>(Q #160) | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Section F.7.4 <u>Certificate of Insurance</u> shall now read:**<br><br>At all times during the period specified above, the Contractor shall maintain with the Administration a current Certificate of Insurance showing the minimum insurance as required in Section F.7.1, F.7.2, and F.7.3 and provide ~~30~~ **60** days written notice to the Administration by the insurance company prior to cancellation or material change in the policy coverage. The Contractor shall submit the Certificate of Insurance to the Administration at least 30 days before the planned performance of any work at the installation site. |

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| Two<br>(Q #161) | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Section F.7.2 <u>General Liability, Including Product Liability</u>, shall now read:**<br><br>**F.7.2 <u>General Liability, Including Product Liability</u>**<br><br>~~General liability, including product and contractual liability, shall have a combine single limit of $10 million with product liability extending to 5 years after acceptance of the last coach. In lieu of a 5-year policy, such coverage may be an annual insurance policy renewable annually for 5 years. If coverage is not available, the Contractor shall warrant the $5 million combined single limit of liability for 5 years after acceptance of the last coach.~~<br><br>See Section IV-Proposal Exhibits; Exhibit K, Item D– Commercial General and Umbrella Liability Insurance. |
| Three<br>(Q #175, 177) | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Section F.4.9 <u>Performance Bond</u>, shall now read:**<br><br>**F.4.9 <u>Performance Bond</u>**<br><br>~~The Contractor's Performance Bond shall continue in full force and effect during the period of the warranties herein specified; however, after Final Acceptance of the last MARC III coaches, a new Bond equal to twenty-five **(25)** percent of the contract value will be acceptable.~~<br><br>The Contractor's Performance Bond shall continue in full force and effect during the period of the warranties herein specified; however, after Conditional Acceptance of the last MARC III coaches, and up till final payment and release claims are made, a new Bond equal to ten (10) percent of the contract value will be acceptable. |
| Four<br>(Q #179) | **Section V Special Provisions**<br><br>**Section H Measurement And Payment** | **Section H.4.3.3 <u>Contract Item 2 - MARC III Coach Overhaul</u>, Milestone Item (1)shall now read:**<br><br>Submittal and Approval of Monthly Project Progress Report. The Contractor may invoice against this milestone each month **for the number of railcars in the Contractor's possession**, during the 30-months succeeding the NTP date. |

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| Five<br>(Q #189) | **Section V Special Provisions**<br><br>**Section H Measurement And Payment** | **Section H.4.3.4.<u>Contract Item 3 - Spares (New Spares and Overhaul of Existing Spares –including two spare trucks)</u>, shall now read:**<br><br>**H.4.3.4.** **~~Contract Item 3 - Spares (New Spares and Overhaul of Existing Spares –including two spare trucks)~~** **<u>Contract Item 3a Overhaul of Existing Spares</u>**<br><br>Payments, as approved by the Administration, will be made upon completion of the specified Contract Item. For this Contract Item, the Contractor may request partial payment(s), which shall also comply with SP Section H.4.4 requirements |
| Six<br>(Q #189) | **Section V Special Provisions**<br><br>**Section H Measurement And Payment** | **Add new Section H.4.3.4.1 <u>Contract Item 3b Mandatory Spares</u>**<br><br>Payments, as approved by the Administration, will be made upon completion of the specified Contract Item. For this Contract Item, the Contractor may request partial payment(s), which shall also comply with SP Section H.4.4 requirements |
| Seven<br>(Q #189) | **Section II Proposal Form With Unit Price Schedule Page 5** | **The entire UNIT PRICE SCHEDULE (BID FORM) shall be deleted and replaced with the UNIT PRICE SCHEDULE (BID FORM) in Addendum 6 Attachment B.** |
| Eight<br>(Q #184) | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4 <u>*Scope of Work*</u>, Item Q, shall now read:**<br><br>~~**Q.** Horn Valve (Cab Control Cars)~~ |
| Nine<br>(Q #185) | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4.4 <u>Pipe Work, Hoses, and Pneumatic Components</u> first sentence, shall now read:**<br><br>**Unless otherwise specified, the** ~~The~~ following existing air brake components shall be removed from the vehicles, overhauled per OEM procedures and reinstalled: |

| | | |
|---|---|---|
| Ten | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4.3 <u>Truck Mounted Brake Units</u> third paragraph, shall now read:**<br><br>Disc brake ~~friction rings~~ **discs** shall be replaced with OEM ~~friction rings~~ **discs** or Administration approved equivalent. ~~Friction ring~~ **Disc** mounting hubs shall be visually inspected for cracks or other damage and shall be replaced if found to be damaged. |
| Eleven<br>(Q #102) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.4 <u>*Side Doors*</u>, Item H. Master Door Controllers., shall now read:**<br><br>**H. Master Door Controllers**. The Master Door Controller Assembly shall be removed, **and replaced with sealed units as supplied on the MARC IIB Overhaul Contract.** ~~cleaned and overhauled. All switches and relays shall be replaced with devices meeting OEM specifications. The Contractor shall replace the indicator lights with service proven LED indicator lights. The LED Indicator Lights shall be approved by the Administration.~~ ~~**[CDRL 902]**~~<br><br>~~The overhauled Master Door Controller Assembly shall be inspected and tested to the latest OEM specifications and procedures and certified to OEM performance criteria~~. |
| Twelve<br>(Q #103) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.4 <u>*Side Doors*</u>, Item I Motorman's Door Controller., shall now read:**<br><br>**I. Motorman's Door Controller**. The Motorman's Door Control Assembly shall be removed, cleaned, and overhauled. All switches, ~~relays, and indicator lights~~ shall be replaced with devices meeting OEM specifications. The Contractor shall propose the use of service proven LED indicator lights to the Administration as part of CDRL 902. The renewed Motorman's Door Control Assembly shall be inspected and tested to the latest manufacturer drawings and procedures and certified to OEM specifications. |

| | | |
|---|---|---|
| Thirteen<br>(Q #188) | **Section VI Technical Specifications**<br><br>**Section 11 Lighting** | **Section 11.2 OVERHAUL REQUIREMENTS, shall now read:**<br><br>The Contractor shall submit a Lighting Overall Overhaul Plan that includes cleaning, inspection, and testing procedures for all interior and exterior lighting for Administration approval prior to start of work. **[CDRL 1101]** The Plan shall include testing each of the four car types to assure the cars conform to the latest requirements of ~~APTA RP-E-012 (latest version), "Recommended Practice for Normal Lighting System Design for Passenger Cars", and~~ APTA RP-E-013(latest version), "Standard for Emergency Lighting System Design for Passenger Cars". The Contractor shall include procedures to overhaul and upgrading lighting units not meeting these standards. |
| Fourteen<br>(Q #188) | **Section VI Technical Specifications**<br><br>**Section 11 Lighting** | **Section 11.2.1 Lights and Fixtures, fourth paragraph shall now read:**<br><br>As an **OPTION,** the contractor shall provide a proposal to replace all interior, including control cab, vestibule and toilet areas, and exterior incandescent lighting, with new LED replacement units meeting the performance requirements of APTA RP-E-012, (latest revision), "Recommended Practice for Normal Lighting System Design for Passenger Cars" **and APTA RP-E-013(latest version), "Standard for Emergency Lighting System Design for Passenger Cars"**. The option for LED shall exclude the headlights, ditch lights and oscillating light. The Contractor shall provide specifications and samples of proposed LED lighting system to the Administration for review and approval. **[CDRL 1102]** The Administration may elect not to include specific lights if they are deemed to be adequate in the OEM condition. |
| | | |

# I. SOLICITATION INFORMATION AND INSTRUCTIONS

# SECTION I
# SOLICITATION INFORMATION AND INSTRUCTIONS
# MARC III KAWASAKI COACHES (63) OVERHAUL
# RFP T-8000-0399

## A. GENERAL

This section specifies the general requirements for the preparation and submittal of Proposals in response to this Request for Proposals (RFP).

### A.1 Schedule of Activities

The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.

| ITEM | DATE |
|---|---|
| RFP Issue Date | April 4, 2013 |
| Pre-Proposal Conference | April 17, 2013 |
| **Additional Vehicle Inspection** | **May 21, 2013** |
| Proposal Inquiry Deadline | ~~May 13, 2013~~ **May 31, 2013** |
| Closing Date for Receipt of Proposals (2:00 p.m.) | ~~July 24, 2013~~ **September 09, 2013** |
| Anticipated Best and Final Offer (BAFO) | ~~September 30, 2013~~ **November 13, 2013** |
| Anticipated Selection Date | ~~October 28, 2013~~ **December 09, 2013** |
| Anticipated Notice to Proceed | ~~January 13, 2014~~ **March, 2014** |

## B. PREPARATION OF PROPOSAL

### B.1 General

The MTA is soliciting an RFP that explains how the Proposer will meet the requirements of this procurement. Statements merely indicating that the Proposer will meet specific requirements are not acceptable. Technical descriptions should be such that the Administration is able to relate what is being offered to equipment that has been used in revenue service on other rail transit systems.

The MTA recognizes that there may be elements of the Proposal considered proprietary and confidential by the Proposer. The Proposal shall identify any specific information or design details that the Proposer considers proprietary. The Proposer shall clearly and prominently

mark each and every page or sheet of such materials with "CONFIDENTIAL" and "PROPRIETARY," as it determines to be appropriate.

The MTA will disclose the information only in accordance with the Maryland Public Information Act. Under no circumstances, however, will the MTA be responsible or liable to the Proposer or any other party for the disclosure of such labeled material, for any reason whatsoever.

**B.2 Issue Date**

**April 4, 2013**

**B.3 Issuing Office**

This RFP is issued by the Office of Procurement of the Maryland Transit Administration and the sole point of contact for contractual questions. This office is the sole point of contact in the MTA for this RFP.

**B.4 Inquiries**

Inquiries and/or questions concerning this proposal shall be submitted in writing on Form 22, Section IV, Exhibit A1, and e-mailed to the Procurement Officer designated below:

**Heidi J. Tarleton**
**Office of Procurement**
**Maryland Transit Administration**
**E-Mail: htarletonprocurementofficer@mta.maryland.gov**

All inquiries and the corresponding MTA responses will be posted on the MTA website at http://www.mta.maryland.gov/solicitations. All questions and requests must be received at the e-mail address specified above no later than 4:00 p.m., local time on **~~May 13, 2013~~ May 31, 2013**.

No requests or inquiries will be considered unless delivered as specified above. The e-mail submitting questions must include the requestor's name, e-mail address, telephone and fax numbers, and the Proposer he/she represents.

**B.5 Submittal of Proposals**

Proposals shall be submitted under the following guidelines.

**B.6 Closing Date**

One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be

submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m**. local time, ~~July 24, 2013~~ **September 9, 2013**, addressed to:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
~~1331 S. Monroe Street, 2nd Floor~~
~~Baltimore, Maryland 21230~~
**6 St. Paul, 7th Floor**
**Baltimore, MD 21202**

In addition, a separate sealed package containing one (1) original, five (5) copies, **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the** Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted.

## B.7 Addenda and Supplements

In the event that it becomes necessary to revise any part of this RFP, or if additional information is necessary to enable the Proposer to make an adequate interpretation of the provisions of the RFP, a supplement will be provided to firms who are identified as holders of the RFP.

## B.8 Acknowledgment of Addenda

The Proposer shall acknowledge receipt of all addenda in the cover letter of the Technical Proposal. Failure to acknowledge all addenda shall cause the rejection of the Proposal.

## B.9 Language Requirement

All language in the Proposal shall be prepared in English. All Contract documents, conferences, letters, technical information, and drawings shall be conducted or offered solely in the English language. All dimensions shall be in the U.S. inch/pound units and metric equivalent, if applicable.

## B.10 Proposal Clarity and Completeness

To be considered, the Proposer is to submit a complete response to the RFP addressing the items requested. Proposal brevity and clarity are desired. The Proposer is advised that the MTA is not obligated to expend extraordinary effort if the Proposal is unclear, difficult to assess, and/or incomplete. At the sole discretion of the MTA such Proposals may be classified as unacceptable.

**B.11 Oral Presentation**

The Proposer will be required to make individual presentations or demonstrations in order to clarify their Proposals and to verify technical submissions. The MTA will not be responsible for any costs incurred by the Proposer in the preparation of oral presentations.

**B.12 Incurring Costs**

The MTA is not liable for any cost incurred by the Offeror in preparation of its Proposal for this Contract.

## C. SUBMITTAL OF PRICE PROPOSALS

The Price Proposal and the Technical Proposal, and any other documents as may be specified when executed and submitted by the Offeror, will constitute his Proposal. Price Proposals not presented on the Unit Price Schedule will not be considered. The Price Proposal shall be filled out in ink or typewritten. If erasures or changes appear in the Price Proposal, each erasure or change shall be initialed and dated by the individual signing the Price Proposal.

All documents bound with or attached to the Proposal are considered a part thereof and shall not be detached or altered when the Proposal is submitted. Proposals shall be submitted in the manner specified.

The Offeror shall specify a price in U.S. dollars for each item given and shall show the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Proposal obtained by adding the amounts of the several items.

## D. PRE-PROPOSAL CONFERENCE

A conference for all Offerors will be held on **April 17, 2013** at the **MARC Martins Maintenance Facility, 2700 Eastern Blvd, Middle River, Maryland 21220**, beginning at **9:00 a.m**. All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team.

## E. DISCUSSIONS

The Administration may enter into discussions with all Qualified Offerors. The term "Qualified Offerors" includes only those responsible Offerors who submitted proposals initially judged by the Procurement Officer to be reasonably susceptible of being selected for award. Discussions shall be led by the Offeror's Project Manager and will consist of an oral presentation by the Offeror to the Administration's Evaluation Committee, questions from and negotiations with the Committee and Procurement Officer. Offerors shall be notified of the time, date, and location of the discussions. **Submission of a proposal does not guarantee an Offeror the opportunity to be invited in for discussions.**

The Administration retains the right, at its discretion, not to hold discussions with Offerors and may award a contract on the basis of technical and price proposals as submitted if,

in the judgment of the Procurement Officer, the response to this RFP demonstrates sufficient competition so that acceptance of an initial offer without negotiation would result in a fair and reasonable price.

## F. BEST AND FINAL OFFERS (BAFO)

When it is in the best interest of the State, the Procurement Officer may permit qualified Offeror(s) to revise their initial proposals by submitting BAFO. This action is in accordance with COMAR 21.05.03.03.D.

## G. THE PROPOSALS

To be considered, Offerors shall submit a complete response to the RFP using the format provided. This proposal format is mandatory. Proposals should provide a straightforward, concise delineation of the Offeror's capability to satisfy the requirements of this RFP.

## H. SIGNATURES

Each proposal shall be signed by an officer authorized to make a binding commitment for the firm(s) making the proposals.

## I. DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

1. **DISADVANTAGED BUSINESS ENTERPRISES ARE ENCOURAGED TO RESPOND TO THIS SOLICITATION NOTICE.**

2. The Maryland Transit Administration hereby notifies all Offerors that, in regard to any Contracts entered into pursuant to this advertisement, Disadvantaged Business Enterprises will be afforded full opportunity to submit Proposals in response to this Notice, and will not be subjected to discrimination on the basis of political or religious opinion or affiliation, race, color, creed, sex, age or national origin in consideration for an award.

3. It is the goal of the Administration that Disadvantaged Business Enterprises participate in all Contracts. Each Contract will contain goals for Disadvantaged Business Enterprise participation on a contracts-to-contracts basis. A subcontracting goal of thirteen percent (9%) has been established for this procurement**.** All bidders/Offeror must submit with their proposal a fully executed copy of the Certified DBE Utilization and Fair Solicitation Affidavit (MDOT DBE FORM A) and DBE Participation Schedule (MDOT DBE FORM B). **Failure to submit the required documents with offer shall result in the Offeror's Technical Proposal as not being deemed reasonably susceptible of being selected for award.**

4. **A Offeror may count toward its DBE goal 60 percent of its expenditures for materials and supplies required under the contract and obtained from a DBE regular dealer, and 100 percent of such expenditures to a DBE manufacturer. The DBE credited supplies may not exceed 60 percent of the entire contract goal.**

5. ALL DBE FIRMS MUST BE CERTIFIED BY THE MARYLAND DEPARTMENT OF TRANSPORTATION AT THE TIME OF TECHNICAL PROPOSAL SUBMITTAL. NO OTHER CERTIFICATIONS WILL BE ACCEPTED. **This process takes an average of SIX months.** By submitting a response to this RFP, the Offeror agrees that, as a minimum, this percentage of the contracts price will be allocated to DBE's.

6. DBE Participation in work performed under this contract will be monitored by the State and must be in accordance with Exhibit E (Contract Exhibits).

7. **Questions or concerns regarding the DBE requirements of this solicitation must be raised before the receipt of technical proposals.**

8. A current directory of DBE/MBE's is available through the Maryland State Department of Transportation, Office of Minority Business Enterprise, P. O. Box 548, 7201 Corporate Center Drive, Hanover, Maryland 21076. The phone number is 410-865-1269 or 1-800-544-6056.

9. **The directory is also available at** http://www.mdot.state.md.us**. Select the Minority/Disadvantaged Business Enterprise link at the left side of the web site, half way down. The most current and up-to-date information on DBE/MBE's is available via this website.**

## J. COMPLIANCE WITH LAW

By submitting an offer in response to this RFP, the Proposer, if selected for award, agrees that it will comply with all Federal, State, and local laws applicable to its activities and obligations under the contract. By submitting an Offer in response to this RFP, the Proposer shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and employee benefits, and if selected for award, that it shall not become so in arrears during the term of the contract.

## K. ACCEPTANCE OF TERMS AND CONDITIONS

By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.

## L. CONFLICT OF INTEREST - CONFIDENTIALITY

The Proposer covenants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of services under this RFP. Without limitation, the Proposer represents to and agrees with the State that the Proposer has no conflict of interest between providing the State services hereunder and any interest the Proposer may have with respect to any other person or entity (including but not limited to any Federal or State regulatory agency) which has any interest adverse or potentially adverse to the State.

The selected Proposer agrees that any information, whether proprietary or not, made

known to or discovered by it during the performance of, or in connection with, this RFP will be kept confidential and not be disclosed to any person other than the State, its designated officials, employees, and authorized agents. The Proposer agrees to immediately notify the State in writing if it is requested to disclose any information made known to or discovered by it during the performance of or in connection with this RFP.

## M. PROTESTS

Any protest relating to this solicitation or the award of a contract must be filed in accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotate Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

## N. INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's proposal in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the contract to be entered into as a result of this RFP.

## O. MEDIA ANNOUNCEMENTS

No media announcements written or oral, pertaining to this RFP or the services, study or project to which it relates shall be made without Administration approval and then only in coordination with the issuing office.

## P. USE OF "e-MARYLAND MARKETPLACE"

"E-Maryland Marketplace" is an electronic commerce system administered by the Maryland Department of General Services. This means that all such information is immediately available to subscribers to e-Maryland Marketplace. Because of the instant access afforded by e-Maryland Marketplace, it is recommended that all Bidders interested in doing business with Maryland State agencies subscribe to e-Maryland Marketplace.

**In order to receive a contracts award, a vendor must be registered on e-Maryland Marketplace.**

# F. LEGAL REQUIREMENTS

# F. LEGAL REQUIREMENTS

## F.1 GENERAL

This section specifies the legal requirements applicable to the Work of this Contract, including liability, patents and copyrights, and warranty requirements.

## F.2 LAWS TO BE OBSERVED

The Contractor shall keep fully informed of all Federal, State, and local laws, ordinances, and regulations of all authorities that in any manner affect those engaged or employed on the Work or in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees. The Contractor shall protect and indemnify the Administration and its representatives against any claim or liability arising from or based on the violation of any law, ordinance, regulation, order, or decree, whether by itself, its employees, or its subcontractors. Particular note should be made of all contractual requirements and General Conditions of this contract. The provisions of this Contract will be governed by the law of the State of Maryland in accordance with COMAR regulations and Section 41, General Conditions.

### F.2.1 Discrepancies

If any discrepancy or inconsistency is discovered in the Contract Documents in relation to any such requirements of law, the Contractor shall immediately report the facts to the Administration in writing.

### F.2.2 ADA Compliance

The Proposer shall include a Certification of Compliance with the Americans With Disabilities Act (see Special Provisions Section C.5.4) with the Price Proposal that the Proposer's Technical Proposal complies with the requirements of the Americans With Disabilities Act.

### F.2.3 Hazardous Materials

Potential Proposers should note that asbestos may be present in the structure of the vehicle(s) to be overhauled. It is the Contractor's responsibility to lawfully remove, dispose, and/or perform asbestos abatement, as needed to accomplish the overhaul work. If any asbestos is found in the vehicle(s), the Contractor shall submit test data and other pertinent information indicating the location of asbestos. If any asbestos is found in the vehicle(s), asbestos abatement shall be addressed on a case-by-case basis and subject to the requirements of Special Provisions Section C.5.3, Miscellaneous Work Allowance.

Potential Proposers should note that hazardous materials may be present in the vehicle(s) to be overhauled. It is the Contractor's responsibility to lawfully remove and dispose of all hazardous materials, as needed to accomplish the overhaul work; and the work is considered to be part of its Price Proposal. The Administration will not accept change orders for removal and disposal of any hazardous material from the as-built vehicle(s).

All new material supplied by the Contractor that has MSDS shall be submitted as part of the documentation.

## F.3 PATENTED AND COPYRIGHTED DEVICES, MATERIALS, AND PROCESSES

If the Contractor is required or desires to use any design, device, material, or process either patent or copyrighted, it shall provide for such use by written permission of the patent or copyright owner and a copy of such permission shall be provided to the Administration. Said written permission shall be supplied to the Administration prior to use of said covered materials. The Contractor and the Surety(ies) shall defend, indemnify and save harmless the Administration, the State, any affected third party, and any political subdivision from any and all claims of infringement by reason of the use of any such patented design, device, material, or process, or any trademark or copyright, and shall indemnify the Administration and the State for any and all costs, expenses, claims, and damages that it may be obliged to pay, by reason of any infringement, at any time during the prosecution or following completion of the Work.

If the use of any such design, device, material, or process is held to constitute an infringement and its further use is enjoined, the Contractor shall, at its own expense and at its option, either procure for the Administration the right to continue using it, or replace or modify same to eliminate the infringement.

### F.3.1 Notice of Impending Claim

The Contractor shall report to the Administration, promptly and in reasonable written detail, any impending claim or suit for patent or copyright infringement based on the performance of this Contract of which the Contractor has knowledge, and shall require its subcontractors to notify it of any such claim or suit.

### F.3.2 Access to Contractor Information

In the event of any claim or suit against the Administration because of any alleged patent or copyright infringement arising out of the performance of this Contract or out of the use of any supplies furnished under this Contract, the Contractor shall furnish to the Administration, when requested by the Administration, all evidence and information pertaining to such suit or claim including all evidence and information in the possession of the Contractor. This notice and assistance requirement shall be included in all subcontracts. In its subcontracts, the Contractor shall require its subcontractors to provide all evidence, information, and assistance necessary to defend such suit or claim.

### F.3.3 Agreement to Settle Claim

The Contractor may either defend or settle any claim or suit alleging patent or copyright infringement arising out of the performance of this Contract. The Contractor shall have no responsibility for any compromise or settlement made by the Administration without Contractor's prior written consent. The parties agree to cooperate with one another in the defense of any such claim and suit.

## F.4 WARRANTY OF WORK

This section supersedes Article 29, "Warranty of Work," as set forth in the General Provisions.

### F.4.1 General Warranty

The Contractor warrants that the title conveyed under the terms of this Contract shall be good and its transfer rightful and that all goods, supplies, systems, and equipment shall be delivered free from all security interests or other liens or encumbrances whatsoever. The Contractor also hereby agrees to warrant and defend the title against all persons claiming the whole or any part thereof.

The Contractor warrants that all goods, supplies, systems, equipment, design, and all work covered by this Contract, including subcontractors and suppliers (except Administration-furnished equipment), shall be satisfactory for their intended purpose, shall conform to, and perform as called for in, the Contract requirements and specifications, and shall be free from all defects and faulty materials and workmanship. Any goods, supplies, systems, equipment, design, and Work found to be defective within the warranty period shall be repaired, remedied, or replaced by the Contractor, free of all charges including transportation. Any latent defects discovered, including but not limited to goods, supplies, systems, equipment, design, and work shall be repaired, remedied, or replaced by the Contractor free of all charges, including transportation.

#### F.4.1.1 Warranty Period

The Contractor shall guarantee all replacement parts and systems of the MARC III coaches, as well as repaired parts, for a period of two (2) years for new and upgraded parts, and for a period of one (1) year for overhauled parts, from the date of conditional acceptance of each car. The guarantee on parts replaced or repaired under warranty shall extend from the time of replacement or repair. If a subsystem or component of a car has not been accepted when the car is placed into revenue service, the warranty on that subsystem or component shall extend two (2) years for new and upgraded items and one (1) year for overhauled items, after the subsystem or component has been accepted. If car is out of service in excess of 72 hours due to lack of spare parts, an equal amount of time rounded up to 24-hour periods (1 day) will be added onto the warranty period of that car.

#### F.4.1.2 Spare Parts

The warranty for both mandatory and recommended spare parts, hereinabove excepted in Section F.4.1.1, shall extend two (2) years from the placement of each spare part into service. The warranty period shall not exceed two (2) years after final acceptance of the 63rd overhauled MARC III coach.

#### F.4.1.3 Engineering Support

The Contractor shall, at its own expense, have a competent engineering staff available on request to assist the Administration's staff in the resolution of engineering or design problems within the scope of the specifications that may arise during the first two (2) years after the final acceptance of the last MARC III coach. The Contractor's engineering representatives shall be available to assess problems on-site within 48 hours of notification

during the Contract period if required by the Administration. Engineering support shall be made available to support the overhauled MARC III coaches during the remainder of their life span on terms mutually agreed upon by the Contractor and the Administration, with any applicable labor rate charges being no more than the Contractor's most favored customer.

#### F.4.1.4 Safety Defects

Any safety related defect identified by the Administration or the Contractor, which affects any products or services provided under the contract, shall be repaired by the Contractor using its own resources, work force, tools, equipment, and parts for a two (2) year period from the date of final acceptance of the last MARC III coach. Repairs shall be carried out in accordance with the requirements of Section F.4.4. This provision is in addition to any statutory rights available to the Administration.

### F.4.2 ~~Warranty Period – Specific Subsystems~~ Not Used

~~In addition to the general warranties specified above, the Contractor warrants that the items listed in Section F.4.2.1 shall provide the indicated service in years or miles, whichever occurs first. The warranty period starts from the date of conditional acceptance of each MARC III coach by the Administration~~.

### F.4.3 High Failure Rate

In addition to the above warranty, if any single failure mode on a single component of any new, upgraded, or overhauled subsystem develops and the number of such failures reaches 10 percent of the population of an item in any single year during the warranty period, the Contractor shall provide, at the Administration's option, full approved repairs, adjustments, or redesign and replacement, at no cost to the Administration. Such correction shall be to the Administration's satisfaction and shall include correction to all cars, including cars for which the warranty period has expired.

"Single year" is defined for the purpose of this section as a 12-month period starting at commencement of placing the first MARC III coach into revenue service until the warranty period expires. The failure rate shall be computed by using relevant failures as defined in Section A.8.2 of the Special Provisions, which shall be counted for the purposes of determining this statistic.

### F.4.4 Corrective Work Requirements

The Administration will give the Contractor a written notice of observed defects or failures with reasonable promptness, but in any event not later than 30 days after observing the defect or failure. Unless otherwise directed in this notice, the Contractor shall commence corrective work at the time specified by the Administration, but in no event later than 2 working days after notification by the Administration of the defect or failure. The Contractor shall diligently pursue such corrective work to completion.

Replacement parts and repairs provided pursuant to corrective work hereunder shall be subject to prior approval of the Administration and shall be tendered and performed in the same manner and extent as items originally delivered.

To prevent delays and disruption to Administration's operations, the Administration shall have the right, when practical and feasible, in its opinion, to the continued use of any such goods, equipment, systems, and Work deemed defective or unsatisfactory, until they can be taken out of service pursuant to the corrective work hereby undertaken by the Contractor. In addition, the following provisions shall be applicable to this Contract:

A. If a defect or failure, in the opinion of the Administration, constitutes an emergency that will jeopardize or impair the operations and schedules of revenue service, the Administration shall provide the Contractor both verbal and written notice thereof and the Contractor shall commence corrective work within 24 hours after receiving verbal notice. Nothing herein shall be construed as preventing MTA's forces or the Contracting Railroad (Amtrak or their successor) from immediately commencing corrective work, with labor cost at the expense of the Contractor, provided that all such corrective work is performed in accordance with the Operations and Maintenance Manuals furnished by the Contractor.

   The Contractor shall reimburse the Administration or make replacement (at the option of the Administration) for any spare parts or materials required by the Administration to perform any corrective work with which it must proceed. Such corrective work by the Administration's forces shall not be construed to invalidate Contractor's warranties and other provisions contained in this Section.

B. Under such emergency conditions, the Contractor, with approval of the Administration, may utilize spare parts from the Administration's spare parts inventory, provided that the Contractor agrees to replace each spare part used under terms and within the time period to be prescribed by the Administration.

C. The warranty provisions described in Special Provisions Section F.4.1.2 shall be applicable to each spare part replaced by the Contractor for parts used pursuant to Special Provisions Section F.4.4(B).

D. During the delivery period and the general warranty period, the Contractor shall maintain qualified representatives at the Administration's site to be available for corrective work performed during delivery and for a period of one year after final acceptance of the last vehicle. The Contractor shall maintain sufficient resources to support the remaining warranty.

### F.4.5 <u>Reliability Requirements for Overhauled MARC III Coaches</u>

The overhauled MARC III coaches shall meet the reliability program requirements specified in the Technical Specifications. The Contractor shall expand the reliability program as needed to take into account all overhauled, new, and upgraded equipment provided in the major vehicle subsystems as defined.

Under all conditions, the Contractor shall be responsible for the design, manufacture and installation (including retrofit of the entire fleet) of all changes into all overhauled MARC III coaches. In addition, such changes and corrections will be incorporated in any undelivered cars prior to delivery. The Administration reserves the right to retrofit any or all changes on accepted cars using Administration personnel with compensation from the Contractor for the

expenses based on reasonable maintenance times and prevailing hourly rates.

### F.4.6 Costs

In addition to all other warranties, expressed or implied, the Contractor, at his sole expense, hereby agrees to bear all costs of corrective work, which shall include, but not be limited to, troubleshooting, removal, necessary disassembly, transportation, reassembly, repair, or replacement of the defective goods, supplies, systems, equipment, and Work; as well as necessary disassembly, reassembly, and repair of all adjacent facilities and structures of the Administration and its construction contractors damaged as a result of the malfunction of the herein warranted goods, supplies, systems, equipment, and Work, including the expense of restoring the aforesaid facilities and structures and the cost of providing ingress and egress to these facilities and structures to accommodate corrective work.

### F.4.7 Failure to Perform Corrective Work

If the Contractor is unable or fails within the time prescribed to commence and diligently pursue and complete the corrective work, the Administration is by this provision authorized by the Contractor, at the option of the Administration and upon written notice to the Contractor and the Surety(ies), to contract with another or use their own forces to perform the warranty work. The Contractor hereby agrees to reimburse the Administration for all costs and expenses in connection with such corrective work, including, but not limited to, reasonable attorney's fees.

### F.4.8 Timeliness

It is understood and agreed that time is of the essence with respect to all corrective work to be undertaken pursuant to the warranty herein contained, expressed or implied.

### F.4.9 Performance Bond

~~The Contractor's Performance Bond shall continue in full force and effect during the period of the warranties herein specified; however, after Final Acceptance of the last MARC III coaches, a new Bond equal to twenty-five **(25)** percent of the contract value will be acceptable.~~

The Contractor's Performance Bond shall continue in full force and effect during the period of the warranties herein specified; however, after Conditional Acceptance of the last MARC III coaches, and up till final payment and release claims are made, a new Bond equal to ten (10) percent of the contract value will be acceptable.

### F.4.10 Other Legal Rights

The rights and remedies of the Administration under this Section are not intended to be exclusive and shall not preclude the exercise of any other rights or remedies provided for in this Contract, or by law or otherwise.

## F.5 RISK OF LOSS

Risk of loss will pass to the Contractor upon release of the MARC III coaches to the Contractor. Risk of loss will pass to the Administration upon delivery of each overhauled

vehicle, as defined in Special Provisions Section A.4.3, except that loss or damage to equipment resulting from acts of the Contractor shall be the responsibility of the Contractor.

## F.6 NOTICE TO THE ADMINISTRATION OF LABOR DISPUTES

Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this Contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Administration.

The Contractor shall insert the substance of this section in any subcontract hereunder. Each subcontract shall provide that if its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately provide the subcontractor, on the next higher tier, or the Prime Contractor, as the case may be, with all relevant information regarding the dispute.

## F.7 INSURANCE – LIABILITY AT ADMINISTRATION INSTALLATIONS

Throughout the entire period during which Work is performed under this Contract at Administration installations, the Contractor shall, at his expense, procure and maintain insurance covering liabilities that could result from such Work. The minimum insurance required by these provisions is described in sections F.7.1, F.7.2, and F.7.3.

### F.7.1 Worker's Compensation

Insurance shall be sufficient to cover all claims payable under statutory requirements for Worker's Compensation. Self-insurance will be permitted if the Contractor can demonstrate to the Administration that all applicable approvals, regulations, and laws have been complied with.

Worker's Compensation Insurance (see Section IV-Proposal Exhibits; Exhibit K, Item D-Workers Compensation Insurance)

All States Endorsement

### F.7.2 General Liability, Including Product Liability

~~General liability, including product and contractual liability, shall have a combine single limit of $10 million with product liability extending to 5 years after acceptance of the last coach. In lieu of a 5-year policy, such coverage may be an annual insurance policy renewable annually for 5 years. If coverage is not available, the Contractor shall warrant the $5 million combined single limit of liability for 5 years after acceptance of the last coach.~~

See Section IV-Proposal Exhibits; Exhibit K, Item D–Commercial General and Umbrella Liability Insurance.

### F.7.3 Automobile Liability

See Section IV-Proposal Exhibits; Exhibit K, Item D–Automobile and Umbrella Liability

Insurance.

### F.7.4 Certificate of Insurance

At all times during the period specified above, the Contractor shall maintain with the Administration a current Certificate of Insurance showing the minimum insurance as required in Section F.7.1, F.7.2, and F.7.3 and provide ~~30~~ **60** days written notice to the Administration by the insurance company prior to cancellation or material change in the policy coverage. The Contractor shall submit the Certificate of Insurance to the Administration at least 30 days before the planned performance of any work at the installation site.

### F.7.5 Subcontractor Insurance

The Contractor shall require subcontractors at any tier who will perform work at an Administration installation to procure and maintain the insurance as specified in section F.7.1 and F.7.3 during the entire period of their performance at the Administration installation site. The Contractor shall furnish, or assure that there has been furnished to the Administration, a current Certificate of Insurance meeting the requirements of Section F.7.4 for each such subcontractor 5 days before the entry of subcontractor's personnel on the Administration's installation site. The Contractor shall ensure that each subcontractor is adequately covered under the provisions of F.7.2 by the Contractor's policy or by the subcontractor's own insurance.

### F.7.6 Insurance Companies

In every instance, insurance shall be written and maintained with companies acceptable to the Administration and authorized to do business in the State of Maryland.

## F.8 RIGHTS IN TECHNICAL DATA

Technical data means any and all information of a scientific or technical nature, regardless of form or characteristics, to be furnished by the Contractor pursuant to this Contract. It includes, but is not limited to, development or engineering work plus the information used to define a design or process or to procure, produce, support, maintain, or operate the goods, supplies, systems, and equipment furnished hereunder. Examples of technical data include research and engineering data, proprietary software, production drawings, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information.

The Administration, its employees and consultants, shall have the unlimited right to use, duplicate and disclose, in whole or in part and without charge, all technical data, in any manner and for any purpose when, in the opinion of the Administration, such use is required by the Administration in the installation, operation, modification, maintenance, repair, replacement, overhaul, or training involved with the MARC III coach and its system, subsystem, equipment, or LLRU.

The Contractor hereby sells, assigns, conveys and grants to the Administration and its subsidiaries and affiliates, and any successor entities thereto, all of the Contractor's rights, title and interest in any software specifically developed under the Contract, and/or a previous version of the software that was modified or configured by the Contractor in connection with

the Contract, and provided hereunder, in all forms of expression whatsoever, including but not limited to:

A. Source and object code
B. Flow charts, block diagrams, and all related documentation
C. All copyrights, trade secrets, inventions (whether or not patentable)
D. Proprietary rights and intellectual property contained therein.

If the Contractor delegates the development of any of the software, licensed or otherwise, to any subcontractor, supplier or vendor, then the Contractor shall obtain from them, for the benefit of the Administration, a transfer of all rights in accordance with the terms of the Contract. The Contractor shall provide the Administration with documentation satisfactory to the Administration confirming the Contractor has acquired on the Administration's behalf all such rights. One time fee for licensing software shall apply to all new and upgraded vehicle equipment without additional charges.

All software, licensed or otherwise, provided by the Contractor in connection herewith and the ideas, processes, and methods therein contained shall be the property of the Administration, free from any claim or retention of rights thereto on the part of the Contractor, or Contractor's employees, Contractor's subcontractors or any third parties. The Contractor hereby warrants and represents that it possesses all right to and interests in the software and all portions thereof, or otherwise has the right to grant to the Administration the rights provided for in this Contract, without violating any rights of any third party, and there are currently no actual or threatened suits by any such third parties based on an alleged violation of such rights.

With respect to software that is provided to the Administration pursuant to this Contract, but was not specifically developed by the Contractor in connection with the Contract; the Contractor hereby grants to the Administration and its subsidiaries and affiliates, and any successor entities thereto ("Licensees") a perpetual, non-exclusive irrevocable license to use, reproduce, modify and maintain the licensed software, in any form whatsoever, including but not limited to source and object code, for any purpose whatsoever, except as may be set forth herein. As used above, "irrevocable" shall include, but not be limited to, the right of the Administration to continue using the licensed software irrespective of any breach or default pursuant to the terms hereof.

The Licensees may use the licensed software on any and all equipment configurations of whatever make, manufacturer and/or model, owned, controlled or contracted for by the Licensees, or any entities controlling, controlled by, under common control with the Licensees, or which may assume the responsibilities of the Licensees. Irrespective of the number of equipment configuration(s) upon which the licensed software is used, the licensees shall pay no additional license fee, in addition to the right to reproduce the licensed software, as it deems necessary and, subject to the limitations specified herein, to provide the licensed software, including the source and object code forms thereof and the documentation therefore, to any other person(s) or entity(ies) for their use in connection with providing goods and/or services to the Licensees.

Licensees shall not sell, distribute or otherwise disclose the licensed software to any third parties, provided that they shall have the right to sell, distribute or otherwise disclose the licensed software to its agents, contractors, vendors, and consultants for any purpose relating to the operation, evaluation, modification, and/or maintenance of the licensed software, or any equipment or systems related thereto.

Upon approval of the Administration, standard commercially available software packages may be embedded in the software, provided that the Contractor shall obtain for the Administration all licenses as necessary to use such embedded software in perpetuity without additional fee or cost. Except as specifically restricted in the applicable third-party license agreement, all terms of the Contract shall apply to the embedded software package. The Contractor shall identify and provide complete documentation for any embedded software packages. The Administration shall receive full rights to any modifications made by the Contractor to embedded commercial software.

The Administration expects to be able to maintain all software developed for the overhauled vehicles, including vehicle-related software. Therefore, documentation must be complete and accurate including all source code.

If the Contractor does not provide all documentation on commercial software packages and proprietary software packages, the Contractor shall provide a method whereby the Administration receives at no additional charge all modifications, updates, and query service from the Contractor and/or the original vendor.

## F.9 AUDIT AND INSPECTION OF RECORDS

The Contractor shall permit the authorized representatives of the Administration, the U.S. Department of Transportation, and the Comptroller General of the United States to inspect and audit all data and records of the Contractor relating to his performance under this Contract for a period of up to 3 years following completion of this Contract.

## F.10 INDEMNITY

In lieu of General Provision 13, General Indemnity, the Contractor shall indemnify and save harmless the Administration, and its officers, agents and employees, from any and all claims, demands, suits, loss, damage, injury and liability, including costs and expenses incurred in connection therewith, resulting from, arising out of, or in any way connected with the performance of the Contract, including delivery and any loading of supplies and equipment.

Such indemnification shall not be construed to include damages or injuries arising or occurring from the sole negligent acts of the Administration, its officers, agents and employees.

# H. MEASUREMENT AND PAYMENT

# H. MEASUREMENT AND PAYMENT

## H.1 GENERAL

In addition to the Payment provisions of the General Provisions, this section specifies the measurement of quantities and the provisions for payment.

## H.2 MEASUREMENT OF QUANTITIES

For purposes of payment, the Work performed under this Contract will be measured by Special Provisions Section A.4.5, and the Unit Price Schedule (UPS).

## H.3 SCOPE OF PAYMENT

The Contractor will be paid at the prices indicated in the Unit Price Schedule. The compensation provided shall be full payment for all costs including furnishing all materials, supervision, labor, incidentals, tools, services, equipment, permits, licenses, insurance, and for performing all Work under the Contract in a complete and acceptable manner.

## H.4 PROGRESS PAYMENTS

The Administration will make payments consistent with the Payment provisions of the General Conditions, Section 44, Payment of State Obligations, as the Work proceeds on payment estimates submitted by the Contractor, as approved by the Administration.

### H.4.1 Method of Payment

In accordance with Advisory Number 2003-3 issued by the Maryland Board of Public Works (BPW), electronic funds transfer will be issued by the State to pay the Contractor for this Contract and any other State payments due the Contractor unless the State Comptroller's office grants the Contractor an exemption. This Advisory is available on the BPW web site at www.bpw.state.md.us.

### H.4.2 Invoices

A. The Contractor shall submit, no later than the fifteenth (15th) day of each month, a certified invoice in the amount reflecting the progress payment for completed work.

B. The invoice shall be prepared in such form and detail as the Administration may require and shall be supported by copies of invoices, reports, and other evidence required for establishing the invoiced progress payment amount.

### H.4.3 Basis for Computation

The basis for determining the amount due the Contractor for the progress periods will be as listed below.

### H.4.3.1 Contract Item 1 - Management, Engineering, Tooling, and Testing

Contract Item No. 1, Management, Engineering, Tooling, and Testing – progress payments will be made upon satisfactory completion by the Contractor and acceptance by the Administration of the milestones in accordance with the milestone allocation percentages listed below:

**(Contract Item No. 1)**

| Milestone | Percentages |
|---|---|
| 1. Submittal and approval of all of the following:<br>a. Management Plan<br>b. Quality Plan | 12% |
| 2. Submittal and approval of the Baseline Progress schedule | 12% |
| 3. Submittal and approval of all of the following:<br>a. System Work Plans for Carbody, Air Comfort (HVAC), and Communication systems | 7% |
| 4. Submittal and approval of all of the following:<br>a. System Work Plans for all Vehicle systems excluding the specific Work Plans listed under Special Provisions Section H.4.3.1., Item # 3 | 10% |
| 5. Submittal and approval of all of the following:<br>a. Safety Program Plan<br>b. Test Program Plan | 12% |
| 6. Submittal and approval of the Conceptual Design Review (CDR) Document; and Completion of the CDR | 2% |
| 7. Submittal and approval of the Preliminary Design Review (PDR) Document; and Completion of the PDR | 2% |
| 8. Submittal and approval of the Final Design Review (FDR) Document; and Completion of the FDR | 2% |
| 9. Submittal and approval of all of the following:<br>a. Reliability Estimates<br>b. Training Program Plan<br>c. System Support Plan | 5% |
| 10. Submittal and approval of the First Article Inspection (FAI) Plan | 2% |
| 11. Completion of all FAIs | 5% |
| 12. Submittal and approval of all Acceptance Test procedures | 4% |
| 13. Submittal and approval of all Qualification Test procedures | 5% |
| 14. Completion of Qualification Tests for New/Upgraded Systems | 5% |
| 15. Completion of Vehicle Qualification Tests at MTA (First overhauled vehicle of each type) | 5% |
| 16. Completion and furnishing of Assembly and Production As-built Drawings | 10% |

### H.4.3.2 Contract Item la - Management, Engineering, Tooling, Testing – Mobilization

The Contractor may submit an invoice for Contract Item 1a at the effective date of the Notice To Proceed (NTP).

### H.4.3.3 Contract Item 2 - MARC III Coach Overhaul

Progress payments for Contract Item 2 on the Unit Price Schedule will be made based on the Unit Price and upon satisfactory completion, and Administration acceptance, of each milestone in accordance with the percentage allocation listed below. The percentage allocation is on a per vehicle basis, based on the Unit Price for Contract Item 2, as detailed on the Unit Price Schedule.

| Milestone | Percentages Per Unit Price |
|---|---|
| (1) Submittal and Approval of Monthly Project Progress Report. The Contractor may invoice against this milestone each month **for the number of railcars in the Contractor's possession**, during the 30-months succeeding the NTP date. | (15%/Vehicle)/30 |
| (2) Placement and acceptance of subcontracts (or other contractual agreements, if prime contractor is also the supplier), with equipment supplier for the overhaul of the following systems, with delivery schedules compliant with the Administration's requirements for Vehicle delivery:<br>a. Carbody<br>b. Trucks and Suspension<br>c. Couplers and Draft Gear<br>d. Air Brake<br>e. Doors<br>f. HVAC<br>g. Communications | 10%/Vehicle |
| (3) Delivery of all material, components and subsystems to vehicle assembly line | 12%/Vehicle |
| (4) Carbody dissasembly; completion of carshell repair, re-seal and water test | 4%/Vehicle |
| (5) Completion of vehicle interior overhaul | 4%/Vehicle |
| (6) Completion of underfloor overhaul and installation of all underfloor equipment | 5%/Vehicle |
| (7) Completion of specified acceptance and performance tests and adjustments | 10%/Vehicle |
| (8) Administration's approval for shipment of overhauled Vehicle from final assembly site to Administration property | 15%/Vehicle |
| (9) Conditional Acceptance of overhauled Vehicle by the Administration | 10%/Vehicle |
| (10) Completion of initial thirty day acceptance period, post Conditional Acceptance of the overhauled Vehicle | 10%/Vehicle |
| (11) Final Acceptance of Vehicle by the Administration | 5%/Vehicle |

### H.4.3.4. ~~Contract Item 3 - Spares (New Spares and Overhaul of Existing Spares - including two spare trucks)~~ Contract Item 3a Overhaul of Existing Spares

Payments, as approved by the Administration, will be made upon completion of the specified Contract Item. For this Contract Item, the Contractor may request partial payment(s), which shall also comply with SP Section H.4.4 requirements.

### H.4.3.4.1 Contract Item 3b Mandatory Spares

Payments, as approved by the Administration, will be made upon completion of the specified Contract Item. For this Contract Item, the Contractor may request partial payment(s), which shall also comply with SP Section H.4.4 requirements.

### H.4.3.5 Contract Item 4 - Special Tools and DTE (New Special Tools and DTE and Overhaul of Existing Special Tools)

Payments, as approved by the Administration, will be made upon completion of the specified Contract Item.

### H.4.3.6. Contract Item 5 - Training

Payments, as approved by the Administration will be made upon completion of the specified Contract Item.

### H.4.3.7. Contract Item 6 - Manuals

Progress payments for Contract Item 6 on the Unit Price Schedule will be made based on the Unit Price and upon satisfactory completion, and Administration acceptance, of each milestone in accordance with the percentage allocation listed below. The percentage allocation is based on the Lump Sum Price for Contract Item 6, as detailed on the Unit Price Schedule.

| Milestone | Percentages |
|---|---|
| (1) Completion of Configuration Audit | 15% |
| (2) Submittal of Preliminary Manual Outline | 20% |
| (3) Submittal of Initial Draft Manuals | 20% |
| (4) Submittal of Final Draft Manuals | 20% |
| (5) Periodic Updates/Revisions during Warranty period | 10% |
| (6) Submittal of all Final Manuals | 15% |

### H.4.3.8 Contract Items 8 - Miscellaneous Work Allowance

Progress payments as approved by the Administration will be in accordance with the requirements set forth in Section C.5.3.

### H.4.3.9 Contract Item 9 - Hidden Damage Allowance

Payments, as approved by the Administration, will be made in accordance with an approved work control plan for Work satisfactorily completed and/or delivered during the progress period.

### H.4.4 Estimated Cost Breakdown

The Contractor shall furnish for approval a breakdown of the Contract price for every item or lump sum item in the Unit Price Schedule, except where milestones are specified, for which it is anticipated that partial payment will be requested. Milestone H.4.3.1(8), Final Design Review, must be successfully completed before payment will be made for subsequent Milestones (9) through (11) in Section H.4.3.1 and Milestones (8) through (10) in Section H.4.3.3. Items for each main classification of Work shall be included in the estimated cost breakdown and the amount

of the proposal item totaled. The Contractor shall submit the estimated cost breakdown to the Administration at least 60 days before the anticipated partial payment request.

### H.4.5 Payment Provisions

Progress payments may be submitted on a monthly basis for items contained in Section H.4.3. The Administration will pay the Contractor for the Contract value of the Work, as defined in the approved progress payment request, less retention. Unless otherwise specified, progress payments may be withheld if the Contractor has not complied with the contract documents. The Contractor shall certify on each invoice that the total costs invoiced do not exceed the total costs incurred.

### H.4.6 Retention Provisions

In addition to amounts, if any, withheld pursuant to other provisions of the specification, the Administration will retain an amount equal to 5 percent of the value of all work done and materials furnished. Whenever the work is substantially complete, the Administration, if it considers that the amount retained is in excess of amount adequate for its protection, may release to the Contractor all or a portion of this excess amount.

### H.4.7 Minimum Acceptable Value

A progress payment will not be considered acceptable if the total value of Work done, as shown on the estimate, is less than $25,000. However, no estimate accepted, or payment of such estimate, shall be construed to be an acceptance of any defective Work or use of improper materials.

### H.4.8 Title to Material

When any progress payment is made under this contract, title to material acquired and Work performed under this Contract shall vest in the Administration. The Contractor, however will be responsible for risk of loss for such material and Work until delivery is made pursuant to Section A.4.

In addition, when any portion of Work for a vehicle, equipment, or spare parts is included in partial payment estimate, the Contractor shall deliver free and clear title to such portion. The form of the title instrument shall be as approved by the Administration.

## H.5 FINAL PAYMENT

When the Contract has been completed and all vehicles and other deliverables accepted by the Administration, the Contractor shall complete a final estimate of remaining monies due and submit to the Administration within 30 days of such acceptance. In addition to monies due, this final estimate shall include statements setting forth the Work and time charged by Change Orders, the number of days that have been charged against the Contract, and any other valid deductions or charges.

Upon receipt of the final estimate from the Contractor, the Administration will review the final estimate for correctness and reduction of any other charges or liquidated damages which may have been imposed. If the Administration's final estimate is in agreement with the Contractor's final estimate, the Administration will approve the final estimate, and will prepare

the final payment forms and furnish them to the Contractor for execution. If the Contractor agrees with the final payment amount, the Contractor shall execute these forms and return them to the Administration within 10 calendar days from the date the forms are received, whereupon the Administration will process them for final payment.

### H.5.1 Final Payment Dispute

If the Contractor disagrees with the Administration's final estimate, it shall notify the Administration of its protest and non-acceptance within 10 days after receipt of the Administration's final estimate. The Administration then will pay the Contractor for a semifinal estimate with deductions for all prior payments and a retainage equal to 1-1/2 percent of the total estimated value of the Contract. The acceptance of the semifinal estimate shall not be considered a wavier on the part of the Contractor of his right to pursue his protest and press for an acceptance and final payment.

Following payment of the semi-final estimate and proper notification from the Contractor that the Contractor has outstanding claim or claims properly filed and detailed, the Administration and the Contractor shall confer at a mutually convenient time and endeavor to reconcile all points of disagreement. If reconciliation is accomplished, the Administration will proceed with acceptance and final payment on the reconciled basis.

If reconciliation is not accomplished within 30 days, the Administration will prepare the final estimate and final payment forms, together with whatever data the Contractor may have submitted in support of the protest regarding the various factors in dispute. These items will be sent to the Contractor by the registered mail. The Contractor may then submit to the Administration, within 10 days after receipt of said registered mail, a written statement for review and final action. The decision of the Administration shall be final and no further appeal will be considered except as provided in Article 28 of the General Provisions. Such decision and payment by the Administration shall be deemed to constitute acceptance and final payment.

### H.5.2 Adjustment for Overpayment

All prior partial estimates and payments will be subject to correction at the time of acceptance and final payment and if the Contractor has been previously overpaid, the amount of such overpayment will be set forth in the final payment forms and the Contractor agrees that he will reimburse the Administration for such overpayment within six months of receipt of such advice, and the Contractor's Surety(ies) will not be granted release from obligations under the terms of the Contract until reimbursement has been made in full.

### H.5.3 Due Date for Final Payment

Payment for the full apparent value of the Contract thus determined shall become due and payable to the Contractor within 90 days after Final Acceptance of the Work.

### H.5.4 Release Claims

As a condition precedent to final payment the Contractor shall execute a general release of all claims against the Administration airing out of or in any way connected with the Contract.

### H.5.5 Fixed Price

The price quoted by the Offeror and accepted by the Administration shall be fixed for the duration of the Contract and not subject to adjustment.

## H.6 SPARE PARTS

The Offeror shall submit, as part of the Price Proposal, a completed Mandatory Spare Parts form and a recommended spare parts listing.

### H.6.1 Mandatory Spare Parts

Mandatory spare parts furnished pursuant to the Unit Price Schedule will be measured on a lump sum basis; however, the Administration reserves the right to modify the unit quantities by plus or minus 20 percent or 1 unit, whichever is greater. Adjustments will be identified no later than 30 days after final design approval and shall be subject to General Provisions, Article 43, Changes. Delivery schedule for mandatory spare parts is defined in Section A.4.5.

### H.6.2 Checkout and Acceptance Testing

No separate payment will be made for spare parts furnished to conduct checkout and acceptance testing of equipment. All such costs shall be considered included in the items of Work to which they pertain.

### H.6.3 Parts Purchased Separately for Maintenance and/ or Repair of Original Equipment

It is understood and agreed that the Administration may separately purchase, from time to time in the future, spare parts for the maintenance and/or repair of the new equipment being herewith offered and furnished, and that any such purchased spare parts shall be supplied and delivered to the Administration under all the same terms and conditions contained in this Contract except for the price, for which the Administration shall be charged no more than the Contractor's most favored customer. Such parts shall be made available for ten (10) years after NTP in order to support continued revenue service in Baltimore, Maryland.

# SECTION II

# PROPOSAL FORM WITH UNIT PRICE SCHEDULE

**SECTION II**
**MARYLAND TRANSIT ADMINISTRATION**
**PROPOSAL FORM/UNIT PRICE SCHEDULE**

**CONTRACT NO. T-8000-0399**
**MARC III KAWASAKI COACHES (63) OVERHAUL**

TO: MARYLAND TRANSIT ADMINISTRATION
ATTN: CONTRACT ADMINISTRATION DEPARTMENT
6 ST. PAUL STREET, 7TH FLOOR
BALTIMORE, MD 21202-1614

PROPOSAL OPENING DATE:
**September 9, 2013**
PROPOSAL OPENING TIME:
**2:00PM** Local Time

*Envelope Marked "Price Proposal" Contract No. T-8000-0399

PROPOSAL OF:_____
(Proposer's Name)

Prospective Proposer:

1. This proposal is hereby submitted to the Maryland Transit Administration (hereinafter sometimes called the "Administration") in response to SOLICITATION INFORMATION AND INSTRUCTIONS dated .

2. The UNDERSIGNED has thoroughly examined, acknowledges receipt of, and is familiar with the Contract Documents as well as the various instructions, information, and requirements covering the same, all as mentioned herein and in said SOLICITATION INFORMATION AND INSTRUCTIONS.

3. In compliance with said SOLICITATION INFORMATION AND INSTRUCTIONS the undersigned hereby propose to furnish all labor, equipment, and materials and perform all work described in and in strict accordance with the provisions of the Contract Documents for the consideration of the Unit Prices, total price and list less percentage, listed in the attached Proposal Form, and agrees that upon Notice of Award, within ninety (90) calendar days after the date of opening of proposals, unless mutually extended, he will within 120 calendar days after receipt of the prescribed forms, execute the Contract.

4. The UNDERSIGNED agrees and understands that the time of completion is as specified in the Special Provisions, unless the completion dates are extended as provided for in the Contract Documents.

5. The UNDERSIGNED hereby certifies that the _____ (Proposer's Name)/ /is, / /is not (CHECK ONE) included on the U.S. Comptroller General's List of ineligible contractors.

6. PARENT COMPANY

   a. The UNDERSIGNED represents that it / /is, / /is not, (CHECK ONE) OWNED OR CONTROLLED BY A parent company. For this purpose a parent company is defined as

one, which either owns or controls the activities and basic business policies of the UNDERSIGNED. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company such ownership is not required; if another company is able to formulate, determine or veto basic business policy decisions of the proposalder, such other company is considered the parent of the proposalder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.

b. If UNDERSIGNED is owned or controlled by a parent company, insert in the space below the name and main office address of the parent company.

_____
Name

_____
Address

7. CERTIFICATION OF NON-MARYLAND CORPORATION (FOREIGN CORPORATION)

   a. A corporation not incorporated in the State of Maryland is considered to be a foreign corporation and, therefore, required to be registered with the Maryland State Department of Assessments and Taxation, if awarded this contract.

   b. Where a foreign corporation is currently registered with the Department of Assessments and Taxation, such a proposalder shall submit with his proposal a copy of the department's certification of his registration or qualification acknowledgement.

   c. If a foreign corporation is not currently registered, such a proposalder shall submit with his proposal his certification that, if notified of his apparent award of the contract, he will register with the Maryland State Department of Assessments and Taxation and provide a copy of the departments certification of his registration or qualification acknowledgement along with the executed contract.

8. The UNDERSIGNED acknowledges receipt of the following addenda to the Proposal Documents (Give the number and date of each).

   Addendum No._____ Dated_____

   Addendum No._____ Dated_____

   Addendum No._____ Dated_____

   Addendum No._____ Dated_____

   Failure to acknowledge receipt of all addenda may cause the proposal to be considered not responsive to the invitation, which would require rejection of the proposal.

A. CORPORATION PROPOSAL:

_____
Name of Corporation

_____
State in which Incorporated

FEIN:_____

_____
Business Address

_____
Telephone

Attest:

By:

_____
Secretary

_____
President or Vice President

_____
Print Name

_____
Print Name

B. PARTNERSHIP PROPOSAL:

FEIN: _____

_____
Name of Partnership

_____
Business Address

_____
Telephone

Names of Each Partner:

_____

_____

_____
Witness:

_____

_____
By:

_____
Signature

_____
Print Name

C. INDIVIDUAL PROPOSAL

_____
Name

_____
Business Address

_____
Telephone

Witness:

_____
Print Name

By:

_____
Signature

_____
Print Name

## Contract T-8000-0399
## UNIT PRICE SCHEDULE (BID FORM)

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL PRICE |
|---|---|---|---|---|---|
| | **Base Scope of Work:** | | | | |
| **1.** | **Management, Engineering, Tooling and Testing** | **Lump Sum** | | | **$ _____** |
| **1a.** | **Management, Engineering, Tooling and Testing - Mobilization** | **Lump Sum** | | | **$ _____** |
| **2.** | **MARC III Railcars Overhaul** | | | | |
| | 2-1a Carbody: Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-1b Carbody: Trailer Car (Incl. Snack) | Carset | 42 | $_____ | $ _____ |
| | 2-1c Carbody: Trailer w/Toilet | Carset | 7 | $_____ | $ _____ |
| | 2-2 Trucks and Suspension | Carset | 63 | $_____ | $ _____ |
| | 2-3 Couplers and Draft Gear | Carset | 63 | $_____ | $ _____ |
| | 2-4 Air Brake | Carset | 63 | $_____ | $ _____ |
| | 2-5 Electrical | Carset | 63 | $_____ | $ _____ |
| | 2-6 Interior | Carset | 63 | $_____ | $ _____ |
| | 2-7 Toilet Room | Carset | 21 | $_____ | $ _____ |
| | 2-8 Water and Waste Retention | Carset | 21 | $_____ | $ _____ |
| | 2-9 Doors | Carset | 63 | $_____ | $ _____ |
| | 2-10 HVAC | Carset | 63 | $_____ | $ _____ |
| | 2-11 Lighting | Carset | 63 | $_____ | $ _____ |
| | 2-12 Communications; Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-12b Communications: Trailer, Snack, TwT | Carset | 49 | $_____ | $ _____ |
| | 2-13 Cab Equipment | Carset | 14 | $_____ | $ _____ |
| | | | | **(Avg. cost based on Item 2 Total Price)** | **Sum of Items 2-1 through 2-13** |
| | | | | **$_____** | **$ _____** |
| **3a.** | Overhaul of Existing Spares | Lump Sum | | | $ _____ |
| **3b** | Mandatory Spares | Lump Sum | | | **$ 500,000** |
| **4.** | Special Tools and DTE (new special tools and DTE and overhaul of existing special tools and DTE) | Lump Sum | | | $ _____ |
| **5.** | Training | Lump Sum | | | $ _____ |
| **6.** | Manuals | Lump Sum | | | $ _____ |
| **7.** | **Base Scope of Work Total Price [Sum of Items 1, 1a, 2, 3a, 3b, 4, 5, and 6]** | | | | **$ _____** |
| | **Option Scope of Work:** | | | | |
| 8. | Stepwell Surface Replacement (TS 1.3.7) | Carset | 63 | $_____ | $ _____ |
| 9. | Parking Brake Cable Replacement (TS 4.4.5) | Carset | 63 | $_____ | $ _____ |
| 10. | VRE Style Seating Reconfiguration (TS 6.2.23 ) | Carset | 13 | $_____ | $ _____ |
| 11. | Passenger Convenience Outlets (5.2.3) | Carset | 63 | $_____ | $ _____ |
| 12. | New Toilet Room Module (7.3) | Carset | 21 | $_____ | $ _____ |
| 13. | Incandescent Lighting Replacement (11.2.1) | Carset | 63 | $_____ | $ _____ |
| 14. | Operators Seat Replacement (13.2.11) | Carset | 14 | $_____ | $ _____ |
| **(A)** | **Option Scope of Work Total Price [Sum of Items 8, 9, 10, 11, 12, 13, and 14]** | | | | **$ _____** |
| **16.** | **Miscellaneous Work Allowance** | Lump Sum | | | **$ 1,250,000** |
| **17.** | **Hidden Damage Allowance** | Lump Sum | | | **$ 500,000** |

**TOTAL PRICE [Sum of 7, (A), 16, and 17]** **$ _____**

# SECTION 04
# AIR BRAKE

# SECTION 04
# AIR BRAKE

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# SECTION 04
# AIR BRAKE

## 4.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with a brake system built around basic WABCO 26-C Type Brake System equipment. The Cab Control cars are also equipped with a 26-C Cab Control Unit and 26-C brake valve for manual control of the trainlined brake pipe pressure in the consist. The normal operation of the train's brake system is a locomotive equipped with 26-L brake valve or from a Cab Control car equipped with a 26-C brake valve.
The brake system includes a cable operated handbrake which activates the brake on two disc brake units per car.

The brake system includes a load sensing feature, which reads the car's air spring pressure, and modulates maximum brake cylinder pressure in both service and emergency braking in order to keep braking demand within normal adhesion limits, and to achieve the specified braking rates. Cab Control cars are equipped with a sanding system which applies sand to both rails at the wheels on the lead axle No. 1 of the F-end. Sanding is automatically controlled by the Forward/Reverse key on the master controller so that sand is always delivered ahead of the leading wheels of the train. Sand application is inhibited on the Cab Control car when the locomotive is forward.

The brake system includes WABCO E-7 DECELOSTAT wheel slide detection and correction equipment that shall keep the braking rate as nearly constant as is physically possible under varying adhesion conditions.

### 4.1.1 Performance Requirements

The existing car performance is and shall remain as follows, after the overhaul:

**A.** **<u>System Pressure</u>**: The maximum design pressures for the air brake system are:
Main Reservoir: 150 psi (1034 kPa) with the locomotive governor set at 125 to 140 psi (861 to 965 kPa)
Brake Pipe: 110 psi (758 kPa)
Max. Brake Cylinder: l00 psi (689 kPa)

**B.** **<u>Deceleration Rates:</u>**
The brake system shall be overhauled so that the original As-Built deceleration rates are achieved. An average full service brake deceleration rate of 2.00 mphps (0.89 $m/s^2$) shall be achieved from stops initiated at all speeds up to 125 mph (202 km/h).

The maximum instantaneous car deceleration rate during the full service stop shall not exceed 2.75 mphps (1.23 $m/s^2$). The maximum change in service brake deceleration (Jerk Rate) during service brake application shall not exceed 1.5 mphpsps (0.67 $m/s^3$).

In addition to achieving the deceleration rates as specified above, the brake system shall produce a maximum single car deceleration rate of 2.50 mphps (1.12 $m/s^2$) during emergency brake applications.

The Contractor shall verify by testing the overhauled air brake equipment by performing a type tests and routine tests as required in TS Section 14. The Contractor shall provide a test plan for Administration review and approval per TS Section 14.

System responses and results shall meet the Specification values for all weather conditions. Rail conditions may be taken into account by the Administration on a case by case basis during adverse weather.

Braking shall be considered to have begun at the instant of brake handle movement. The train shall be considered stopped upon energization of the zero speed relay.

## 4.2 OVERHAUL REQUIREMENTS

The Contractor shall submit an Air Brake Overall Overhaul Plan to the Administration for approval **[CDRL 401].** The plan shall include all cleaning, inspection, repair, and testing procedures. In general, the brake system shall be overhauled per OEM heavy repair maintenance requirements. Overhauling requirements are discussed in the sections below including; base scope of work, modifications, additions and options.

~~An option to replace the WABCO E-7 DECELOSTAT system with a KNORR MGS2 wheel slide control system is further discussed below.~~

The entire brake system shall be overhauled to comply with all applicable requirements of 49 CFR 238.231 and facilitate performance of the APTA approved Single Car Test, 49 CFR 238.311 and Class I Brake Test defined in 49 CFR 238.313. The entire brake system shall be inspected and tested as required by 49 CFR 229.25, 229.27, 229.31 and 229.29 and 49 CFR 238.309. In addition, Form FRA 6180-49A shall be updated.

## 4.3 RECONFIGURATION

The Contractor is responsible for ensuring the overhauled air brake system configuration is in compliance with the latest OEM specifications and requirements. The Contractor shall revise

the appropriate As-Built drawings and documentation (as required in TS Section 17, Management and Support Systems within this Specification) to ensure configuration control; and that the proper documentation reflects all changes made to the As-Built configuration. This may include, but is not limited to OEM equipment/components, design modifications/upgrades, and approved modification/upgrades performed during this overhaul.

## 4.4 SCOPE OF WORK

The following existing air brake system components and associated air system components shall be removed from the vehicles, overhauled, and reinstalled per OEM procedures and recommendations: The Original Equipment Manufacturer (OEM) of the existing air brake system is WABCO (now named Wabtec Corporation, Passenger Transit). The air brake system shall be tested in accordance with TS Section 14.

- **A.** D-7 Operating Unit – including all control portions, valves, cocks, filters, and pressure switches.
- **B.** The 26-C Cab Control Unit – including the 26-C Brake Valve portion and all control portions, valves, and electrical devises.
- **C.** Laminated brake pipe manifolds
- **D.** B-3-B Emergency Brake Valves
- **E.** VX Vent Valves
- **F.** A-1 Charging Valve
- **G.** E-3 Brake Application Valves
- **H.** N-1-D Magnet Valves
- **I.** Air Filters and Air Filters with Choke
- **J.** H-5 and HB-5 RELAYAIR Valves
- **K.** N-3-E Magnet Valve
- **L.** Filters, Strainers and Check Valve
- **M.** Check Valves and Check Valves with Choke
- **N.** Air Suspension Double Check Valves
- **O.** Air Suspension Compensating Valves
- **P.** Air Suspension Leveling Valves
- ~~**Q.** Sanding Control Valves and Sanding Nozzles (Cab Control Cars)~~
- ~~**Q.** Horn Valve (Cab Control Cars)~~

All component identification labels or decals shall be cleaned or renewed.

### 4.4.1 WABCO E-7 Decelostat

The existing WABCO E-7 DECELOSTAT, wheel slip-slide detection and correction controller located in the Electric Locker shall be replaced with a KNORR MGS2 system or Administration approved equivalent.

Slide detection and correction shall be independent of load condition AW0 through AW3.

Slide detection shall be performed on all four axles and corrections made on a per truck basis.

The contractor shall propose compatible magnetic speed sensors to replace the existing units. The contractor shall use the existing axle mounted interfaces and toothed gear wheels.

All speed sensors, connectors, and cable assemblies shall be sealed to prevent water intrusion and shall. Speed sensors shall comply with the requirements of TS Section 2.4.8.

The Contractor shall submit the details of the slip-slide correction system with all electrical and pneumatic system schematics, component drawings and specifications, interfaces, software documentation, and testing for review and approval of the Administration. **[CDRL 404]**.

### 4.4.2 Reservoirs

Main and supply reservoirs shall be inspected and tested in accordance with 49 CFR 229.31. All other reservoirs, including equalizing and combined reservoirs shall be inspected and tested in accordance with ASME's Boiler and Pressure Vessel Code.

Failed reservoirs shall be replaced with new reservoirs.

Successfully tested reservoirs shall have the exteriors primed and painted and stenciled with white letters and numerals. The interiors shall be cleaned and de-scaled.

Drain valves shall be inspected, tested, and overhauled, or replaced.

Automatic drain valves shall be inspected, tested, and overhauled or replaced.

Any replacement air reservoirs shall be pressure vessels conforming to the latest revision of ASME Boiler and Pressure Vessel Code, as required in TS Section 15. Main and supply reservoirs shall include telltale holes, as called out in 49 CFR 229.31(c). Test reports and certification for each pressure vessel shall be included in the Car History Book.

### 4.4.3 Truck Mounted Brake Units

Tread brake units shall be overhauled per OEM specifications. Mechanical linkages shall be ~~evaluated for wear and~~ renewed per OEM specifications.

Disc brake calipers units shall be overhauled per OEM specifications. Mechanical linkages shall be overhauled per OEM specifications.

Disc brake ~~friction rings~~ **discs** shall be replaced with OEM ~~friction rings~~ **discs** or Administration approved equivalent. ~~Friction ring~~ **Disc** mounting hubs shall be visually inspected for cracks or other damage and shall be replaced if found to be damaged.

All tread brake shoes and disk brake pads shall be renewed.

### 4.4.4 Pipe Work, Hoses, and Pneumatic Components

**Unless otherwise specified, the** ~~The~~ following existing air brake components shall be removed from the vehicles, overhauled per OEM procedures and reinstalled:

- **A.** Brake Cylinder Pressure Switches
- **B.** Duplex Air Gages
- **C.** All Cutout Cocks
- **D.** All Drain Cutout Cocks
- **E.** All Angled Cocks
- **F.** All Cutout Cocks with Locking Handles and Vents
- **G.** Car end brake pipe and main reservoir pipe cutout cocks are ball type with locking handles and shall be overhauled per OEM specifications or renewed.
- **H.** Cutout cocks to the brake cylinder pipe on each truck shall be overhauled per OEM specifications or renewed.
- **I.** Cutout cocks to other air operated equipment shall be overhauled per OEM specifications or renewed.
- **J.** Renew existing end of car brake pipe angle cocks and main reservoir cutout cocks.
- **K.** All pneumatic brake indicators shall be overhauled including, hoses, air cylinder, fittings, seals, and colored plunger end.
- **L.** All existing steel pipe shall be thoroughly flushed and cleaned and inspected. All steel piping shall be dried and capped to prevent the infiltration of moisture or debris. All missing pipe clamps shall be renewed. Air piping shall be tested in accordance with TS Section 14 requirements.
- **M.** All copper lines and fittings shall be thoroughly flushed and cleaned and inspected. All copper lines shall be dried and capped to prevent the infiltration of moisture or debris. All missing pipe clamps shall be renewed.
- **N.** All hoses shall be renewed and dated no less than one year prior to acceptance. Brake pipe trainline hose connections shall be in accordance with AAR Specification M-601, latest revision and shall be less than one (1) year old from date of manufacture at the time of delivery of car to MARC.
- **O.** Main reservoir trainline connections and any other air system hoses shall be a wire reinforced type in accordance with AAR Specification M-618, latest revision and shall be less than one (1) year old from date of manufacture at time of delivery of car to the Administration.
- **P.** All brake pipe welding repairs shall be done in accordance with AAR S-402. Prior to the installation of any valves, after welding and assembly, all piping shall be blown clean while being mechanically excited by shaking in accordance with AAR S-402. The pipe system, including hoses and couplings, shall then be charged to not less than 125% of the working pressure and all pipe joints or fittings shall be tested with a soap solution. All air leaks shall be corrected and retested before any further

assembly is performed. Maximum leakage allowable shall be 5 psi in 10 minutes following a 5 minute settlement period.

**Q.** Brake pipe installation, access for maintenance, and fittings shall comply with Part E of the AAR Manual of Standards and Recommended Practices.

**R.** All pneumatic test fittings shall be inspected, overhauled or replaced.

Air pipe system from the main reservoirs utilized for auxiliary functions in addition to the brake system shall be included in the overhauling.

### 4.4.5 Handbrake

The handbrake system shall be overhauled per OEM procedures. All linkages, bushings, and pins shall be ~~evaluated for wear,~~ renewed ~~or replaced~~. The hand lever shall be overhauled, cleaned, and painted.

Parking brake cables to the disc brake actuators shall be renewed with new cables. **As an OPTION**, a new cable design having demonstrated reliability and durability, and shall be submitted to the Administration for review and approval **[CDRL 402]**.

Parking brake chains shall be evaluated for wear, cleaned, or replaced.

The parking brake electrical micro-switch and wiring shall be overhauled, or replaced.

All rubber seals and gaskets shall be renewed.

Securely mounted padding material provided to shield chain weights from car structure and vestibule equipment shall be renewed per OEM.

## 4.5 SANDING SYSTEM REMOVAL

The Contractor shall submit a procedure for the removal of the sanding system for Administration approval. **[CDRL 403]** Both sand boxes shall be removed from each Control Cab car F-end. The existing sanding magnet vales shall be removed. The existing sand traps, sanding nozzles and hoses shall be removed. All carbody air pipe ends shall be plugged with the appropriate pipe plugs and shall be leak proof.

### 4.5.1 Sanding Controls

The ability to command sand from the control cab to the locomotive sanders shall remain. The sanding control to the Control Cab car sanders shall be disabled.

The sanding selector toggle switch (forward or reverse) on the cab console switch panel shall be removed.

The non-latching “wobble” manual sanding switch on the cab control console to manually control sanding on the locomotive shall be renewed.

The indicator light on the cab console switch panel that illuminates when the locomotive or car is calling for sanding shall be renewed.

## 4.6 REQUIRED CDRLS

401 The Air Brake Overall Overhaul Plan shall be submitted to the Administration for approval.

402 An optional new parking brake cable design shall be submitted to the Administration for review and approval.

403 The Contractor shall submit a procedure for the removal of the sanding system for Administration approval.

404 The Contractor shall submit the details of the replacement slip-slide system for review and approval of the Administration.

# SECTION 09
# DOOR AND DOOR CONTROL

# SECTION 09
# DOOR AND DOOR CONTROL

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# SECTION 09
# DOOR AND DOOR CONTROL

## 9.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with side doors, end doors and vestibule doors. The side doors utilize existing door operators with controls at each door and in the cab. The non-cab and cab end doors are fully mechanical and are equipped with locking mechanisms. The vestibule doors are electrically powered by an overhead door operator and will have a proposed alternate design using linear ~~synchronous~~ motor technology or permanent magnet type ~~synchronous~~ motor technology and microprocessor control.

## 9.2 OVERHAUL REQUIREMENTS

The Contractor is responsible to conduct a complete overhaul of the doors and door control systems. The objective of this overhaul is to repair, replace or reconfigure components in order to return the cars to their as built configuration and functionality. The door control system may have been modified by running repairs during the service life of the vehicles and it is the Contractor's responsibility to obtain the complete door control system specification and overhaul requirements from the OEM.

A Door and Door Control Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul. **[CDRL 901]** All components of the door system shall be overhauled to return them to their as-built OEM condition. All enclosures and equipment areas shall be cleaned and returned to OEM condition.

All doors and door control systems shall be tested to verify the function of the door control system in both the signal car and multiple car configurations as specified in TS Section 14, Testing and OEM procedures.

All equipment shall retain the OEM equipment label or may be renewed in kind retaining the OEM information. All wiring removed during the overhaul of equipment shall be tagged for identification during re-installation of the equipment. All wiring and wire terminations shall be inspected and replaced as needed. Wire terminations shall be properly torqued to OEM specifications during re-installation of the equipment. All new components and wiring shall be labeled and identified in accordance with the OEM schematic diagrams format.

The Contractor shall be responsible for all proper interfaces and functionality of the entire door system.

This plan shall name all subcontractors performing overhaul work on the Doors and Door Controls, including their scope of work, and it shall provide recommendations to control overhaul cost and the basis for the necessary component replacement.

All inspections are to follow APTA RP-I&M-003-98, Rev 1 "Recommended Practice for Door System Periodic Inspection and Maintenance," and based on the OEM manuals. All work shall be performed to the OEM Criteria and comply with the Materials, Workmanship and Standards TS Section 15 of this Specification.

Any reconfiguration of the Door Control equipment must be presented to the Administration for review and approval prior to the start of the overhaul.

## 9.3 SCOPE OF WORK

All overhauled, refurbished or replaced door and door control components shall meet the requirement and performance criteria of the OEM. All work shall be conducted in strict compliance with the OEM requirements and recommendations. All procedures shall be included in the Door and Door Control Overall Overhaul Plan.

## 9.4 SIDE DOORS

A. **Side Doors Panels**. The Contractor shall overhaul the door panels as required to fully restore functionality and appearance. The door pockets, including the bottom tracks, door guides, drains, and inside walls shall be cleaned, inspected, and overhauled to restore original functionality. All existing hardware shall be overhauled and seals shall be renewed, including the pocket weather seals, and Teflon guides. Side door hangers shall be renewed and adjusted as required to provide free operation. **For estimating purposes, it is anticipated 20% of hangers will be replaced.**

B. **Electric Door Operators**. The Contractor shall remove all door operators from the car. The door operators shall be overhauled by the OEM or an Administration approved equivalent. The operators, connection rods, and extension arm assemblies shall be overhauled. All rubber parts, gaskets, and springs shall be renewed or replaced. All parts requiring repainting shall be painted according to accepted practices. The overhauled unit shall be checked and tested to the latest OEM specifications and procedures and certified to OEM performance criteria.

C. **Motors**. The Contractor shall clean and inspect the door operator motors for proper operation. Motors shall be inspected and tested at a minimum for malfunction, bad bearings, burned or worn commutators and serviced in accordance with OEM specifications. All non-repairable motors shall be replaced with new motors. All motor brushes shall be replaced with brushes meeting OEM specifications.

D. **Gear Box**. The gear box shall be removed, cleaned, and inspected. The ~~gears shall be inspected to assure that the gears rotate freely and mesh accurately without~~

~~backlash.~~ **gear box shall be overhauled per OEM specification.** All gaskets shall be replaced.

E. **Mechanical Lock Assembly**. The mechanical door lockout assembly shall ~~be removed cleaned and inspected~~ **be upgraded to comply with APTA SS-M-10 Paragraphs 2.8.1 and 2.9.** The operation of the cutout switch shall be verified.

F. **Limit Switches, Cams and Resistors**. The Contractor shall replace all limit switches and resistors. The proper operation of the cams shall be verified.

G. **Door Operator Cutout Switch**. The Contractor shall verify that the door operator cutout switch functions properly. Doors shall not be operable when the switch is in the cutout or bypass position. When the switch is in the normal position the door function shall be re-established.

H. **Master Door Controllers**. The Master Door Controller Assembly shall be removed, **and replaced with sealed units as supplied on the MARC IIB Overhaul Contract.** ~~cleaned and overhauled. All switches and relays shall be replaced with devices meeting OEM specifications. The Contractor shall replace the indicator lights with service proven LED indicator lights. The LED Indicator Lights shall be approved by the Administration. **[CDRL 902]**~~

~~The overhauled Master Door Controller Assembly shall be inspected and tested to the latest OEM specifications and procedures and certified to OEM performance criteria~~.

I. **Motorman's Door Controller**. The Motorman's Door Control Assembly shall be removed, cleaned, and overhauled. All switches, ~~relays, and indicator lights~~ shall be replaced with devices meeting OEM specifications. The Contractor shall propose the use of service proven LED indicator lights to the Administration as part of CDRL 902. The renewed Motorman's Door Control Assembly shall be inspected and tested to the latest manufacturer drawings and procedures and certified to OEM specifications.

J. **Emergency Door Release Assemblies**. The Contractor shall inspect all Emergency Door Release Assemblies for function and ease of use. All cable assemblies shall be inspected. The ~~Contractor shall test that all~~ interior and exterior emergency releases **shall** operate in accordance with **the current revision of** APTA Standard SS-C&S-012-02~~. The Administration shall be allowed to witness testing.~~

K. **Emergency Pull Handles**. The Contractor shall inspect and overhaul all emergency release pull handles. The Contractor shall ensure all handles are properly secured to the cable.

L. **Emergency Door Release Signs**. All emergency door release signs shall be cleaned to ensure that the signs are clearly visible and readable per OEM requirements. Signs that are worn or damaged shall be replaced. Replacement signs shall comply with current FRA, ADA and APTA requirements and shall be approved by the Administration. **[CDRL 903]**

M. **Sensitive Edge Assembly and Switch**. The Contractor shall renew the sensitive edge assembly and pressure wave switch with an OEM switch**, upgraded to the latest configuration per the OEM recommendation,** or Administration approved equal. The proper mounting and routing of the pneumatic tubing between the sensitive edge assembly and the pressure wave switch shall be verified. **Controls for the doors shall be arranged so that obstruction sensing by the panel edge complies with APTA SS-C&S-012-02.**

N. **Door Control Relay Panel**. The Contractor shall overhaul the relay panel per OEM requirements. All relays and suppression devices shall be replaced. The Contractor shall test the proper function of the relay panel and verify all interfaces.

O. **Door Closing Warning**. The Contractor shall verify the proper functionally of the door closing warning circuits. The audible and visual alarms shall be validated in accordance with the OEM requirements.

P. **Crew Switch**. The Contractor shall renew the interior and exterior crew switches. Their functionality shall be validated to OEM requirements. All exterior crew switch covers and gaskets shall be renewed.

Q. **Outside Signal Lights**. The outside door indicator lights shall be replaced with LED indicators mounted in low profile housings. The indicators shall be visible in bright daylight from the end of an eight (8) car consist.

R. **Conductors Buzzer**. The Contractor shall verify the function of the Conductors buzzer in each vestibule in accordance with the OEM requirements.

S. **Override Relay**. The Contractor shall verify that the override relay prevents the door operation by cutting off the power to door control trainlines and door control switches.

T. **Side Doors Panels**. The Contractor shall remove all side doors. All mechanical parts and mechanisms shall be inspected for proper function. All elastomeric materials shall be renewed. All exterior weather stripping and seals including those mounted to the carbody shall be renewed. All door panels shall be cleaned and inspected. Damaged panels shall be repaired or renewed. Superficial damage to the door panels shall not be repaired. Door shall be water tight and pass a leak tasked in accordance with specification TS Section 14.

U. **Miscellaneous Equipment**. The Contractor shall perform functional checks on all miscellaneous door control system components and replace any broken, missing, or worn-out parts, and test them in accordance with OEM requirements.

## 9.5 END DOORS

Non-cab and cab end doors shall be overhauled to fully restore functionality and appearance.

All hardware shall be overhauled and seals shall be renewed including door rubber and weather seals.

On cab cars the F-End pneumatic door seals shall be overhauled and renewed as needed. All air plumbing, fittings, and hardware shall be inspected, replaced as needed, and leak checked. The three-way air valve shall be overhauled and tested. If necessary the air pressure shall be adjusted to OEM requirements.

Threshold and drains shall be cleaned and overhauled to restore original functionality.

Inspect, clean, test, overhaul, or renew if required, and reinstall the door lock assembly.

## 9.6 VESTIBULE DOORS

Vestibule doors panels shall be overhauled to fully restore functionality and appearance. The door pockets, lower tracks, drains, inside walls shall be cleaned, inspected, and overhauled to restore original appearance and functionality. All hardware shall be overhauled and seals shall be renewed, including weather seals and Teflon guides. The door hangers, upper guide, sills, lever, arms, and base shall be overhauled or renewed to restore original functionality. For estimating purposes, it is anticipated 20% of hangers, guides, and arms will be replaced.

The Contractor shall propose an alternate design to the existing electrically operated overhead door operator and touch switch. **[CDRL 904]** The alternate design shall utilize linear ~~synchronous~~ motor technology or permanent magnet type ~~synchronous~~ motor technology and microprocessor control. The alternate design shall maintain the OEM door panel Carbody interfaces and utilize the existing door panel design in the alternate proposal. As part of the alternate door proposal, the contractor shall propose a new vestibule door OPEN touch switch design for Administration approval. All vestibule door touch plates shall be replaced with the new design.

The alternate door control and touch switch design shall meet all the requirements of the existing OEM door controls including:

1. Time opening sequence that responds to the current push plate; Door Opens upon activation and remains open for 15 seconds (adjustable from 10 seconds in 1 second intervals)

2. Détente which will hold the door closed during loss of power regardless of car motion and vibration with up to a 6 inch super elevation.

3. Hold open feature to prevent door oscillations during the open interval when the car leans toward the door closing direction with up to 6 inch super elevation.

4. A pressure wave sensitive edge capable of sensing a flat bar 3 inches wide by ¼ inch thick, perpendicular to door panel, and between the door panel and the door jamb. The sensitive edge shall sense the obstruction over the entire length of the door panel, with the exception of the 3 inches from the top of the door panel and 1 inch from the bottom of the door panel.

5. Three-Position guarded switch located near the door in the passenger compartment with the following positions:

   a. "OPEN" (spring return) allows for a 5 minute door open duration when activated by the momentary switch. The mode returns to "NORMAL" after the 5 minutes times out. The 5 minute open duration shall be canceled by briefly moving the switch to the MANUAL position and then to the NORMAL position.

   b. "MANUAL" (un-powered) allows for the unpowered door to be opened and closed manually.

   c. "NORMAL" Allows for the door to operation as described.

6. 3 Position guarded switch located in the vestibule near the door which shall function similar to the passenger compartment switch.

7. The door operator and controls shall operate from the 74 VDC car battery system and be able to be operated down to the car load shed voltage without damage to the door operator motor and controls.

8. The maximum force required to move an unpowered door shall not exceed a force of 20 pounds-force.

9. The drive mechanism shall be designed and constructed to minimize the torque applied to the door panel.

10. Mechanical failure of the door drive mechanism shall not impede the manual movement of the door panel.

11. The door opening and closing force shall not exceed 25 pounds-force over the travel of the door.

12. The door shall open and close with a 60 pounds-force applied normal to the center of the interior door surface at a height of 56 inches above the floor.

13. Stall protection shall be provided to prevent damage or degradation to the door operator should the door panel become immobilized for extended periods of time.

14. Doors shall not require adjustment more often than every 2 years after the initial break-in period.

15. The door motor, drive assembly and controls shall not require maintenance between heavy overhaul periods.

## 9.7 TRAP DOORS

The Contractor shall clean, inspect and restore the stairwell trap door to the OEM requirements. When in the down position, the spring tension of the trap door shall be adjusted so that the door will raise a minimum of ten inches. When in the up position, the spring tension of trap door shall be adjusted as to prevent the door from slamming shut or creating a pinch hazard.

## 9.8 REQUIRED CDRLS

901 A Door and Door Control Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul.

902 The LED Indicator Lights shall be approved by the Administration.

903 Replacement signs shall comply with current FRA, ADA and APTA requirements and shall be approved by the Administration.

904 The Contractor shall propose an alternate design to the existing electrically operated overhead vestibule door operator and touch switch.

# SECTION 11
# LIGHTING

# SECTION 11
# LIGHTING

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# SECTION 11
# LIGHTING

## 11.1 GENERAL SYSTEM DESCRIPTION

The lighting system includes both interior, including control cab, vestibule and toilet areas, stepwells, and exterior lights and is powered by both 120 VAC, 60 Hz and 72 VDC. The interior OEM lighting is mostly made up of fluorescent lamps and fixtures. Exterior lighting includes marker, ditch, platform, and side signal indicator lights on all cars. Exterior lighting also includes headlights and oscillating lights on Cab cars.

## 11.2 OVERHAUL REQUIREMENTS

The Contractor shall submit a Lighting Overall Overhaul Plan that includes cleaning, inspection, and testing procedures for all interior and exterior lighting for Administration approval prior to start of work. **[CDRL 1101]** The Plan shall include testing each of the four car types to assure the cars conform to the latest requirements of ~~APTA RP-E-012 (latest version), "Recommended Practice for Normal Lighting System Design for Passenger Cars", and~~ APTA RP-E-013(latest version), "Standard for Emergency Lighting System Design for Passenger Cars". The Contractor shall include procedures to overhaul and upgrading lighting units not meeting these standards.

### 11.2.1 Lights and Fixtures

The Contractor shall remove all the light fixtures and diffuser units in the passenger areas, vestibules, and stepwells. The Contractor shall thoroughly clean and overhaul the lighting lenses, diffusers, connectors, and housings. All lamps shall be replaced. Locker, compartment, and snack bar lighting shall be cleaned and tested. All lamps shall be replaced. Fluorescent lamps tubes shall be disposed of in accordance with the applicable EPA guidelines.

All car exterior lighting shall be cleaned and overhauled. All cab cars with ditch lights shall have the controller tested to OEM specification. All headlight, ditch light, and oscillating light bulbs shall be renewed. The oscillating light mechanism on cab cars shall be cleaned, inspected, lubricated, and tested. Any failed component shall be renewed. All marker lights shall be cleaned, overhauled and have bulbs replaced.

All car number sign lights shall be cleaned and overhauled. All light bulbs shall be replaced.

As an **OPTION,** the contractor shall provide a proposal to replace all interior, including control cab, vestibule and toilet areas, and exterior incandescent lighting, with new LED replacement units meeting the performance requirements of APTA RP-E-012, (latest revision), "Recommended Practice for Normal Lighting System Design for Passenger Cars" **and APTA**

**RP-E-013(latest version), "Standard for Emergency Lighting System Design for Passenger Cars"**. The option for LED shall exclude the headlights, ditch lights and oscillating light. The Contractor shall provide specifications and samples of proposed LED lighting system to the Administration for review and approval. **[CDRL 1102]** The Administration may elect not to include specific lights if they are deemed to be adequate in the OEM condition.

## 11.3 REQUIRED CDRLS

1101 The lighting test procedures shall be submitted and approved prior to testing.

1102 The Contractor shall provide specifications and samples of proposed LED lighting system to the Administration for review and approval.

# Addendum No. 6

## Attachment A - Responses to Planholder's Written Questions

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 6 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 156 | General | | Is MTA going to provide an anticipated replacement percentage for all of the items that need to be replaced if they cannot be overhauled? For example how many air reservoirs shall be estimated in case of failure as called out in section 4.4.2? We can provide further examples if required. | Cases where items are replaced in excess of the specified percentage or where no replacement percentage is specified, will be handled according to Section C.5.3 Miscellaneous Work Allowance.<br><br>Also, please refer to the Overhaul definition on page A-17. |
| 157 | Section IV, Exhibit K Insurance - copies of policies | | Insurance - copies of policies: Section IV, Exhibit K, paragraph A provides "If requested by Engineer, the Contractor shall provide a certified copy of the actual policies and endorsements in addition to certificates." Our insurance policies contain proprietary information and as such, are not available to be given to third parties. Other arrangements can be made however, such as providing an MTA representative access to the policy documents at our premises, for example. | Acceptable. |
| 158 | Section IV, Exhibit K Insurance - pollution liability | | Insurance - pollution liability: Section IV, Exhibit K, paragraph D 5, 2nd paragraph contains a reference to "Insurance as required in paragraph 1 …". We believe this reference should be to paragraph 5. | No change. |
| 159 | Section IV, Exhibit K Insurance - Additional Insureds | | Section IV, Exhibit K, paragraph E requires that certificates show that the MTA has been added as additional insured under all policies required. Please note that this cannot be performed for Worker's Compensation / Employer's Liability. | No change. |
| 160 | Section IV, Exhibit K Insurance - cancellation notice | | Section IV, Exhibit K states that 60 days prior notice is required. Section V, F 7.4 states that 30 days prior notice is required. Please advise which version of the insurance specifications has precedence. | See Addendum 6 Item 1. |
| 161 | Section IV, Exhibit K Insurance - limit of general liability insurance | | Section IV, Exhibit K states that the limits required are $2M for general liability and $5M for umbrella, and that 2 years completed operations coverage must be maintained after acceptance of the work. Section V, F 7.2 states that a limit of $10M of general liability will be required, with coverage for products extending 5 years after delivery of the last coach. Please advise which version of the insurance specifications has precedence. | See Addendum 6 Item 2. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 162 | Section IV, Exhibit K - Indemnity requirements | | Section IV, Exhibit K includes indemnity requirements. However, Section IV, Exhibit Z also includes indemnity requirements, which differ from those in Exhibit K. Furthermore, Section V, F 10 has its own indemnity requirements. Please advise which version has precedence. | All insurance limits are to be $5,000,000 as in Section IV Exhibit K. Please also see response to Question 161 above. |
| 23 | Section IV Proposal Exhibits<br><br>Exhibit Z General Provisions for Purchase Contracts | Item 6 Taxes | Can the authority confirm that materials received by the Contractor to perform the overhaul of the cars are exempt from sales tax? | Please see Exhibit Z General Provisions For Purchase Contracts, section 6. Taxes. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 163 | General Provisions 21 | | General Provisions 21 provides a very broad termination right for the MTA throughout the performance of the work by the Contractor. As written, the MTA could terminate the Contract in the event a minor default occurs during the project. Such minor default which would allow the MTA to terminate, based on the contract terms, could include a one day delay or the failure of the Contractor to respect a minor technical requirement.<br><br>The Contractor believes that the MTA does not have the intention of terminating the contract for such a minor technicality or delay, and thus, would suggest a modification to the Contract terms to be more in line with the intent of the parties.<br><br>The Contractor therefore proposes that the termination for default of the MTA be limited to a material breach of the Contract. Furthermore, in the event such event occurs, Contractor should be given the opportunity to cure the default. Time to cure such default should be at least thirty (30) days and, if not curable within said delay, reasonable steps taken by the Contractor to cure such default during such time period should be acceptable to the MTA.<br><br>Moreover, any termination right associated with the delay in the performance of the Work by the Contractor should be limited to a delay which exceeds by one (1) year the scheduled contract date.<br><br>The Contractor requests that the MTA consider the above proposed modifications. | No change. |
| 164 | A.1 Schedule of Activities | | Relative to Closing Date for Receipt of Proposals, several subsystem suppliers have told us they need additional time to provide a comprehensive technical and commercial proposal. As such, we request an extension of 6 weeks to the current due date of June 28. | Please see Addendum 5. |
| 165 | Special Provisions A.5.1.E | | This Section currently states that the MTA will provide mainline track for acceptance testing during limited day time / night time and weekend hours. Would the MTA please provide additional details in this respect? For example, the tracks will be available from X am to Y am on weeknights and from A am to B am on weekends. | For bidding purposes the contractor shall estimate 8 hours per weekend. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 166 | Special Provisions A.6 | | Please provide clarification on the following sentence: "The MTA may at any time perform, or cause to be performed by other Contractors, work related to the Work under this Contract".<br><br>The Contractor understands that despite the above sentence, the MTA intends to have successful proposer perform all the Work required within the Specification, but that the successful proposer shall cooperate with any ongoing work being performed by the MTA or other Contractors during the project. Please confirm the above interpretation of the Contractor. | Confirmed. |
| 167 | Special Provisions D.10 | | As this is an overhaul project, the Contractor requests that liquidated damages for delay only begin in the event the Contractor fails to achieve the contractual delivery date for the final vehicle to be overhauled on the project.<br><br>This request is due because for an overhaul project, the additional costs for the MTA in the event of a delay are mainly linked to additional project management cost that will need to be paid, and these only occur if the project end date is extended, rather than increased each time an individual vehicle is delayed.<br><br>By modifying the Contract as so, this will reduce a portion of the risk associated with delays for the Contractor, while maintaining sufficient coverage for the MTA in the event of a delay, and therefore reduce the overall price of the project for the MTA. | No change. |
| 168 | Special Provisions D.13.2 | | Would the MTA please confirm that all the requirements included in Section D.13.2 in connection with the submission of cost or pricing data is only applicable in the event of a price adjustment during execution of the Contract, and not for all subcontracts entered into pursuant to the original proposal of the Contractor? | Please see Section D.13 first sentence. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 169 | Special Provisions F.2 | | The Contractor agrees that it shall perform the work in accordance with all applicable laws and regulations. However, in the event a change in law or regulation occurs following the submittal of the Contractor's bid and that such change impacts the price and/or the delivery schedule of the project, the Contractor proposes that such modification be subject to the Changes clause of the contract, and that an equitable adjustment be made accordingly. Please confirm if the proposed change is acceptable. | Not acceptable. No change. |
| 170 | Special Provisions F.4.1.1 | | Special Provisions F.4.1.1 provides that "The guarantee on parts replaced or repaired under warranty shall extend from the time of replacement or repair".<br><br>The Contractor interprets the above sentence to mean that any parts repaired during the warranty period will still be covered under the original warranty period of 2 years (or 1 year for overhauled parts) for the replaced part.<br><br>Please confirm if the Contractor's interpretation is correct. | The Contractors interpretation is not correct.<br><br>Please also, see SP Section F.4.3, High Failure Rate. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 171 | Special Provisions F.4.1.2 | | As it is very difficult for Contractors to obtain a warranty beyond one year for spares from its subcontractors, the Contractor strongly suggests that the MTA consider reducing the length of the warranty period for spare parts to one year on this contract.<br><br>In the event the length of the warranty period for spare parts is not reduced, the Contractor will need to significantly increase the cost per spare, which will probably increase the price for the MTA in such a way that the cost to maintain a warranty period for one additional year would exceed the cost to purchase additional spares in the event a spare breaks down during the one year period between the proposed warranty period of the Contractor and the warranty period currently set out in the Contract.<br><br>Additionally, as it is very hard for the Contractor to know when the spare parts are actually put into revenue service, and therefore monitor the warranty period, we suggest that the warranty period be linked to acceptance of the spares at the MTA's facility. This is common practice in the spare parts industry. | No change. |
| 172 | Special Provisions – F.4.2 | | Section 4.2 provides that ''the items listed in Section F.4.2.1 shall provide the indicated service in years or miles, whichever occurs first.'' However, there is no section F.4.2.1. Please confirm that there is no specific warranty period for specific subsystems. | Please see Addendum 4 Item 2. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 173 | Special Provisions F.4.3 and F.4.5 | | As the intent of reliability programs, such as those provided for in Section F.4.3 and F.4.5, is to ensure the adequateness of the design of the rail cars and its various subsystems, it is customary to only include such requirements for new systems incorporated into rail cars.<br><br>As such, the Contractor requests that the above mentioned provisions use be limited only to new subsystems which are designed by the Contractor and its suppliers for this Contract.<br><br>The reason behind this is as follows: for all systems that are not newly designed by the Contractor (or its suppliers), the Contractor inherits a certain reliability potential from the previous design, and as such, performing the requested tasks of the technical specification will only allow the Contractor to achieve a certain reliability that cannot exceed the inherent design. | No change. |
| 174 | Special Provisions F.4.6 and F.4.8 | | As the Contractor believes that the MTA is looking for the most advantageous offer and that the express warranties contained in the contract are quite defined and exhaustive, the Contractor would like to confirm its assumption that implied warranties are excluded from the Contract.<br><br>Should the above assumption of the Contractor be correct, would the MTA consider specifying this in the Special Provisions and eliminating the reference to implied warranties contained in Section F.4.6 and F.4.8? | No change. |
| 175 | Special Provisions – F.4.9 | | This section 4.9 provides that ''after final acceptance of the last MARC III coaches, a new Bond equal to twenty-five (25) percent of the contract value will be acceptable.'' The initial Performance Bond shall be in an amount equal to twenty-five (25) percent of the contract value. Please clarify whether the intention is to accept a decrease in the amount of the Performance Bond after the Final Acceptance of the last MARC III coaches and if so, what would be such decreased amount. | See Addendum 6 Item 3. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 176 | Special Provisions F.4.9 | | Please confirm that the Performance Bond will be released by the MTA after the Warranty period of two years specified in Section F.4.1.1 of the Special Provisions. | Confirmed. |
| 177 | Special Provisions F.4.9 | | Please clarify the length of time that a Warranty Bond will be required.<br>Typically, the Warranty Bond is only required during the General Warranty period of the Contract, and it would therefore expire two years after the conditional acceptance of the last vehicle overhauled by the Contractor.<br>Please confirm that the above interpretation of the Contractor is correct. | See Addendum 6 Item 3. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 178 | Special Provisions F.8 | | The technical knowledge and intellectual property of the Contractor and its subcontractors is deemed to be extremely confidential by the owners of such rights. Indeed, the technical knowledge provided to the Customer is the core business of the Contractor and its subcontractors, who each manufacture rail cars and various components and subcomponents of rail cars.<br><br>The technical know-how and knowledge that the Contractor and its subcontractors have developed over the many decades of work in the rail industry is what allows us to excel and keep a competitive edge against our competitors.<br><br>Should any disclosure, duplication or copy of such technical know-how and knowledge occur during the contract, this would hinder the Contractor and its subcontractors' ability to do business in the industry, as such disclosure could reduce any competitive advantage the Contractor or its subcontractors possess.<br><br>Additionally, the Contractor believes that it is not necessary for the MTA to possess such technical data, but rather, that it's important for the MTA to be able to use all technical data which is transferred to the MTA pursuant to the Agreement, so that it may use, operate, maintain and repair the rail equipment overhauled as part of this Contract.<br><br>The additional rights which are currently requested by the MTA would in fact allow the MTA to produce the material itself, which the Contractor believes is not the intent of the MTA, and would also allow the MTA to disclose such rights to third parties which in turn could manufacture the products, which the Contractor wants to avoid.<br><br>Moreover, in many cases, the | No change at this time. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 178 Con't. | | | in many cases, the Contractor does not possess the right to disclose the technical data of its subcontractors, which means that it could not fulfill the contractual terms imposed by the MTA as its subcontractors refuse to disclose this information.<br><br>As a result, keeping the contractual terms "as requested by the MTA" would either put the Contractor in a position where it cannot bid the project, significantly decrease the number of subcontractors interested in providing services or cause a significant cost increase to perform the Contract.<br><br>The Contractor therefore strongly suggests that the MTA modify section F.8 of the Special Provisions so that the rights in technical data of the MTA be limited in a way where the MTA can use, operate, maintain and repair its fleet, but not disclose or use the technical data for other means. | |
| 179 | Special Provisions H.4.3.3 (1) | | The first payment milestone in Section H.4.3.3 is that "the Contractor may invoice against this milestone each month, during the 30-months succeeding the NTP date. (15%/Vehicle/30)".<br><br>Should the above be interpreted by the Contractor to mean 15% of the Unit prices for all Vehicles to be payable in equal monthly installment during the 30 month period the project is being completed? | See Addendum 6 Item 4. |
| 180 | TS01-2 / 1.2.3 Weld Inspection Plan | | The term "Recondition" is not found within the section A.8.2 Definitions. This term is used in the sixth paragraph of section 1.2.3 Weld Inspection Plan to define the work scope of the duct bank covers. Please clarify. | See Addendum 4 Item 3. |
| 181 | TS01-2 / 1.2.3 Weld Inspection Plan | | Please clarify what form of inspection is required for the underframe as specified in the third paragraph of section 1.2.3. Is a visual inspection acceptable or is a magnetic particle inspection required? | Please see TS 1.2.3 first paragraph. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 182 | TS02-7, TS05-4 - 2.4.10 Electrical Grounding & 5.2.5 Relays, Contactors and Other Components | | Section 2.4.10 Electrical Grounding provides that "Axle end grounding contacts shall be overhauled or replaced. Carbon Brushes shall be replaced. Spring supports shall be replaced, Sealing O-ring shall be replaced'' whereas section 5.2.5, seventh paragraph, provides that "All end-of-axle ground brush assemblies shall be renewed." Please clarify the work scope regarding the ground brushes. | See Addendum 4 Item 7. |
| 183 | TS02-8 / 2.5 Spare Trucks | | Please confirm if the material needed for the spare trucks is separated from anticipated replacement material already called out in section 2 of the technical specification. As an example – if axles need to be provided on a spare truck pursuant to section 2.5, are they to be taken from the 12 axles required by the MTA in section 2.4.6? | Yes. Please also see Addendum 2 Item 9. |
| 184 | TS04-3, TS13-6 - 4.4.R Brakes – Scope of Work & 13.2.9 Horns | | Section 4.4 Brakes Scope of Work provides that the Horn Valve (4.4.R) shall be overhauled whereas section 13.2.9 Horns provides that "The horn operating valve in the operator's cab shall be renewed." Please clarify the work scope regarding the Horn Valve. | See Addendum 6 Item 8. |
| 185 | TS04-5 / 4.4.4 Pipe Work, Hoses, and Pneumatic Components | | Please clarify the proper work scope for the following:<br>Section 4.4.4.E – Requires all angled cocks to be overhauled whereas section 4.4.4.J –requires renewal of end of car angle cocks.<br>Section 4.4.4.D – Requires all drain cutout cocks to be overhauled whereas section 4.4.4.J – requires the main reservoir cutout cock to be renewed. Please clarify the work scope regarding the cutout cocks.<br>Section 4.4.4.K – Requires the brake indicator hoses to be overhauled whereas section 4.4.4.N – requires all hoses to be renewed. Please clarify the work scope regarding the hoses. | See Addendum 6 Item 9. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 186 | TS05-2, TS05-3 - 5.2.2 Auxiliary Transformer & 5.2.4.A Batteries | | Please clarify what is meant by items to be "renewed on a per fleet basis". Should the term "fleet" be interpreted as all 63 Multi-level cars or is this meant as the Kawasaki Fleet and the VRE Fleet? There are 2 examples in the specification, within section 5.2.2 Auxiliary Transformer and in section 5.2.4.A Batteries. This clarification will help determine if the Contractor needs to quote 10 carsets of each or 20 carsets. | The term "Fleet" includes all 63 cars to include both the MARC type and VRE type cars. |
| 187 | TS05-3 / 5.2.4.A Batteries | | Please clarify what size of batteries is required for the 10 carsets since the batteries for the Cab Cars are 100ah and the rest of the cars have 80 ah batteries per the IPC provided? | The 10 carsets of batteries shall be100ah. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 101 | Section VI Technical Specifications<br><br>Section 09 Door and Door Control | | Specification requires, "The mechanical door lockout assembly shall be removed cleaned and inspected. The operation of the cutout switch shall be verified."<br>1 – The existing mechanical lock is not released from the cutout position when any of the emergency handles are actuated. APTA SS-M-18-10 Paragraph 2.8.1 "Door Isolation Lock requires, "The device shall be capable of being overridden by the door emergency release mechanism." Also APTA Paragraph 2.9 requires, "The emergency release mechanism, when activated, shall unlatch the door, disengage or unlock the door isolation lock (if engaged), …" Please confirm MTA does not require the mechanical cutout locks to be upgraded so the emergency handles will release them.<br>2 – The OEM mechanical door locks PN 5953085900 & 5953085600 do not have integral electrical cutout switches. Toggle switches are mounted on the door operator for that purpose. The second sentence should be deleted because it is already addressed by 9.4.G.<br><br>If MTA desires, a replacement lock assembly incorporating an integral electrical cutout switch needs to be specified instead of simply cleaning & inspecting the existing ones.<br>This upgrade would facilitate the cutting out of one door by a single action on the part of train personnel and avoid two types of errors:<br>- If train personnel mechanically lock the door and fail use the toggle switch on the door operator, the door motor would stall upon receipt of an OPEN command.<br>- If train personnel use the toggle switch on the door operator only without mechanically cutting out the door, a broken linkage or door operator that was not secure in the overcenter linkage locked position could result in an un-annunciated free-wheeling door.<br>Unless MTA specifies this as a change, the upgrade would not occur. | See Addendum 4 Item 13 |

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 6 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 102 | Section I Solicitation Information and Instructions | Item 9.4 Side Doors<br><br>Item H. Master Door Controllers | Specification requires the MDCs to be removed, cleaned and overhauled with all switches and relays to be replaced and lamps to be replaced with LEDs.<br>1 – The original MDCs PN 59530549 & 59530550 supplied by the OEM did not contain any relays. Unless these assemblies have been modified or replaced, references to relays should be deleted from this paragraph.<br>2 – On the MARC IIb overhaul project, replacement MDCs were provided that were sealed. Please advise if this feature is desired on MARC III. Unless MTA specifies this, this upgrade will not occur. | See Addendum 6 Item 11. |
| 103 | Section VI Technical Specifications<br><br>Section 09 Door and Door Control | Item 9.4 Side Doors<br><br>Item I. Motorman's Door Controller | Specification requires, "All switches, relays, and indicator lights shall be replaced with devices meeting OEM specifications."<br><br>The original Motorman's Door Controller PN 5692046101 supplied by the OEM did not contain any relays or indicator lights. Unless these assemblies have been modified or replaced, references to relays and indicator lights should be deleted from this paragraph. | See Addendum 6 Item 12. |
| 188 | Section VI Technical Specifications<br><br>Section 11 Lighting | 11.2 Lighting Overhaul Requirements | Please confirm if all of the lighting fixtures within the vehicles have been designed and equipped to meet all of the standards called out in section 11.2. If these fixtures have not been equipped to meet these standards, should our proposal include this upgrade on all light fixtures? | To the best of the MTA's knowledge the cars meet APTA APTA RP-E-013 with the exception of the requirements for disaster lighting. The cars should be brought up to these specifications.<br><br>See Addendum 6 Items 13, 14. |
| 189 | TS17-20 - 17.12.2 Spare Parts | | To ensure fairness between all bidders proposal, would the MTA please provide a mandatory spare parts list that every bidder can quote? | See Addendum 6 Items 5, 6, 7. |

# Addendum No. 6

## Attachment B - UNIT PRICE SCHEDULE (BID FORM)

## Contract T-8000-0399
## UNIT PRICE SCHEDULE (BID FORM)

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL PRICE |
|---|---|---|---|---|---|
| | **Base Scope of Work:** | | | | |
| **1.** | **Management, Engineering, Tooling and Testing** | **Lump Sum** | | | **$ _____** |
| **1a.** | **Management, Engineering, Tooling and Testing - Mobilization** | **Lump Sum** | | | **$ _____** |
| **2.** | **MARC III Railcars Overhaul** | | | | |
| | 2-1a Carbody: Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-1b Carbody: Trailer Car (Incl. Snack) | Carset | 42 | $_____ | $ _____ |
| | 2-1c Carbody: Trailer w/Toilet | Carset | 7 | $_____ | $ _____ |
| | 2-2 Trucks and Suspension | Carset | 63 | $_____ | $ _____ |
| | 2-3 Couplers and Draft Gear | Carset | 63 | $_____ | $ _____ |
| | 2-4 Air Brake | Carset | 63 | $_____ | $ _____ |
| | 2-5 Electrical | Carset | 63 | $_____ | $ _____ |
| | 2-6 Interior | Carset | 63 | $_____ | $ _____ |
| | 2-7 Toilet Room | Carset | 21 | $_____ | $ _____ |
| | 2-8 Water and Waste Retention | Carset | 21 | $_____ | $ _____ |
| | 2-9 Doors | Carset | 63 | $_____ | $ _____ |
| | 2-10 HVAC | Carset | 63 | $_____ | $ _____ |
| | 2-11 Lighting | Carset | 63 | $_____ | $ _____ |
| | 2-12 Communications; Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-12b Communications: Trailer, Snack, TwT | Carset | 49 | $_____ | $ _____ |
| | 2-13 Cab Equipment | Carset | 14 | $_____ | $ _____ |
| | | | | **(Avg. cost based on Item 2 Total Price)** | **Sum of Items 2-1 through 2-13** |
| | | | | **$_____** | **$ _____** |
| **3a.** | Overhaul of Existing Spares | Lump Sum | | | $ _____ |
| **3b** | Mandatory Spares | Lump Sum | | | **$ 500,000** |
| **4.** | Special Tools and DTE (new special tools and DTE and overhaul of existing special tools and DTE) | Lump Sum | | | $ _____ |
| **5.** | Training | Lump Sum | | | $ _____ |
| **6.** | Manuals | Lump Sum | | | $ _____ |
| **7.** | **Base Scope of Work Total Price [Sum of Items 1, 1a, 2, 3a, 3b, 4, 5, and 6]** | | | | **$ _____** |
| | **Option Scope of Work:** | | | | |
| 8. | Stepwell Surface Replacement (TS 1.3.7) | Carset | 63 | $_____ | $ _____ |
| 9. | Parking Brake Cable Replacement (TS 4.4.5) | Carset | 63 | $_____ | $ _____ |
| 10. | VRE Style Seating Reconfiguration (TS 6.2.23 ) | Carset | 13 | $_____ | $ _____ |
| 11. | Passenger Convenience Outlets (5.2.3) | Carset | 63 | $_____ | $ _____ |
| 12. | New Toilet Room Module (7.3) | Carset | 21 | $_____ | $ _____ |
| 13. | Incandescent Lighting Replacement (11.2.1) | Carset | 63 | $_____ | $ _____ |
| 14. | Operators Seat Replacement (13.2.11) | Carset | 14 | $_____ | $ _____ |
| **(A)** | **Option Scope of Work Total Price [Sum of Items 8, 9, 10, 11, 12, 13, and 14]** | | | | **$ _____** |
| **16.** | **Miscellaneous Work Allowance** | Lump Sum | | | **$ 1,250,000** |
| **17.** | **Hidden Damage Allowance** | Lump Sum | | | **$ 500,000** |

**TOTAL PRICE [Sum of 7, (A), 16, and 17]** **$ _____**

# SECTION 01
# CARBODY

# SECTION 01
# CARBODY


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# SECTION 01
# CARBODY

## 1.1 GENERAL SYSTEM DESCRIPTION

The carbody shell is a three level semi-monocoque structure in which the longitudinal members, vertical and transverse framing members, as well as the skin sheeting, consist of low carbon content stainless steel.

## 1.2 OVERHAUL REQUIREMENTS

The carbody shall be cleaned, inspected, and overhauled to repair all damaged or defective areas of the structure and car shell. At a minimum the Contractor shall submit a Carbody Overall Overhaul Plan that includes cleaning, inspection, and overhaul procedures for all areas of the carbody structure and car shell identified in this section for Administration approval prior to start of work **[CDRL 101].**

The exterior of the carbody shall be thoroughly inspected for cracks, deformations, and corrosion. Defects discovered shall be brought to the attention of the Administration and repaired in accordance with the approved procedures. The Contractor shall bid on repairing a minimum of twenty (20), 12-inch by 24-inch carbody exterior areas. The number of 12-inch by 24-inch areas will be determined at the outbound inspection for each car.

It is the Contractor's responsibility to survey each car and itemize the defect locations and repairs required.

Replacement of body parts or underfloor equipment shall preserve all external clearance requirements and clearance requirements between the trucks and car body or underfloor equipment.

New apparatus, such as material or configuration changes, supplied during the overhaul shall be the same for all vehicles and shall be fully interchangeable.

### 1.2.1 Sides and Ends

End frames and side frames are composed primarily of framing members and skin sheet of low carbon content stainless steel.

Sides and ends shall be inspected, cleaned, and overhauled with all decals removed and renewed with new decals.

The Contractor shall clean, repair, and overhaul the car body side and end sheets, including covering small superfluous mounting holes**.**

### 1.2.2 Underframe

The underframe primary members at the mid floor level at the car ends consist of HSLA structural steel for the end sills, draft pockets, and body bolsters. Underframe members and skin sheet in the center and transition areas consist of low carbon content stainless steel.

The Contractor shall clean, repair, and overhaul all exposed areas of the underframe, including the end and center sections, draft gear, coupler pockets, and the areas around the truck bays.

All critical welds, where readily accessible: end underframe to sideframes, draft pockets, body bolsters, end sills, end plates, underframe transitions, anti-telescoping plates, collision posts, and corner posts shall be inspected, documented, and repaired if required.

### 1.2.3 Weld Inspection Plan

In the Carbody Overall Overhaul Plan, the Contractor shall submit a plan for the weld inspections of critical areas to include locations, type of inspections, and criteria and weld repairs.

All end underframe carbody and equipment connections (welded or bolted) shall be inspected for cracks, corrosion, or material deterioration and repaired. In the Carbody Overall Overhaul Plan, the Contractor shall submit a plan for inspection of connections, including criteria for renewal.

All areas of the buffer wings and stairwell support members showing evidence of corrosion shall be cleaned and repaired. Buffer wear plates and their fasteners shall be renewed with new wear plates and fasteners per OEM requirements. Buffer stems shall be disassembled, cleaned, inspected, and springs renewed.

Visible portions of end underframe crossmembers and floor beams are to be cleaned, inspected for damage, cracks, loss of section to corrosion, and repaired. End underframes are to be overhauled, primed and then given 3 coats of black enamel after inspection and repairs.

Strip and inspect the center underframe for any cracks or openings in the corrugated sheet. Overhaul by repairing cracks in members or welds or by overlaying of corrugated sheet and repaint with approved undercoating material. In the Carbody Overall Overhaul Plan, the Contractor shall submit repair procedures for each configuration and material review and approval before start of repairs.

Remove all covers of the undercar 480 VAC duct bank and wiring and ducts. Inspect and clean all cleat block connections, cable connections, and separators. ~~Recondition~~ **Overhaul** duct bank covers and reinstall.

Inspect and overhaul existing jacking pads as needed. Any failed welds shall be identified and repaired.

In the Carbody Overall Overhaul Plan, the Contractor shall submit a repair procedure for jacking pad welds to the Administration for review and approval.

Replace any damaged car body thermal insulation with same density aluminum faced insulation, or Administration approved equal.

### 1.2.4 Bolster Anchor Brackets

Existing bolster anchor brackets and fasteners shall be cleaned, visually inspected, overhauled, and painted.

Suspected cracks or separation shall be examined by dye penetrant inspection. If crack or separation is confirmed, the bracket shall be renewed.

If the structural integrity of the bolster anchor bracket is compromised by loose fasteners, evidence of two halves slipping or by damage to existing welding, it shall be renewed.

### 1.2.5 Undercar Boxes

All undercar boxes shall be cleaned, inspected, and repaired if dented, pierced, or deformed. Undercar box seals and gaskets shall be renewed for water tightness.

New cotter keys shall be applied to drain holes.

Mounting brackets shall be inspected overhauled, repaired as needed, and new mounting fasteners applied to OEM specified torque values.

End of car trainline junction boxes shall be inspected overhauled, and repaired as needed. Seals and gaskets shall be renewed for water tightness.

### 1.2.6 Collision Posts and Corner Posts

The accessible portions of collision posts, corner posts, and adjacent structure at each end of the car shall be cleaned and inspected for corrosion, cracks, and weld separation on every car.

Drain holes shall be cleaned; hoses, and/or fittings shall be renewed.

### 1.2.7 Roof

All roof levels shall be cleaned, water tested, and inspected. Any damaged side and top roof sheets shall be repaired.

A minimum of four upper level ceiling panels and six light fixtures shall be removed to view interior roof insulation during the water test.

Water leak areas shall be repaired using a cover plate of matching sheet configuration. In the Carbody Overall Overhaul Plan, the Contractor shall submit repair procedures for each configuration and material prior to start of repairs.

Overhaul low roof HVAC mounting feet, air intake, HVAC shrouds, latches, hinges, spall shields, and renew the seals.

Clean, inspect and re-seal existing low to high transition seams.

### 1.2.8 Windows

All existing passenger side window and windshield glazing, sash glass, and mounting rubber shall be removed. All glazing shall be ~~inspected and cleaned. The Contractor shall submit a criteria document for determining if the window glazing requires replacement. [CDRL 102] As part of this plan, the Contractor shall submit replacement material specifications for Administration review and approval. For estimating purposes it is expected that 25% of glazing will be replaced.~~ **renewed. All overhauled MARC III cars, including VRE style MARC III cars, shall match with identical frames, glazing and gaskets.**

All mounting rubber and strip fillers shall be renewed.

All passenger side window openings shall be provided with emergency units on each side of all levels of the car. Not all of the passenger side windows are emergency units. Those that are emergency units shall remain emergency units and be overhauled per the rest of the section.

Emergency window units shall utilize two handles per unit, with a handle to remove the removable glazing rubber, and a handle to remove the window glass for emergency evacuation purpose.

The window glass removal handle shall be located behind the handle for removal of the glazing rubber.

All windows and windshields shall comply with all current requirements of 49 CFR223 and 49 CFR238.

### 1.2.9 End Vestibule

Vestibule interiors and plenum areas above ceilings shall be thoroughly cleaned, inspected, and overhauled to restore original functionality.

Existing safety bars and retainers shall be cleaned and overhauled.

Vestibule floors shall be thoroughly cleaned, inspected, and overhauled to restore original functionality and appearance.

The Contractor shall clean, inspect, repair any corrosion damage.

### 1.2.10 Stepwells and Trapdoors

A. Stepwells. Clean, inspect, and overhaul all visible parts of the stepwell, supports, and step treads.

   Inspect all hardware and renew if missing, damaged, or loose. Replace all reflective tape and decals with new.

   As an option, the Contractor shall propose a replacement stepwell surface as an improvement to the OEM design. The Contractor shall submit the proposed design and installation procedures for Administration approval. **[CDRL 103]**

B. Trap Doors. Existing trap doors and related hardware shall be removed, cleaned, and overhauled.

   Trap door heaters shall be disassembled, overhauled with all wiring renewed, reinstalled, and tested. The Contractor shall propose a design modification to replace the trapdoor heater wiring and loop design between the car body and heater to address the problem of wear and breakage for Administration review and approval. **[CDRL 104].** Broken or incomplete welds shall be repaired. Torsion springs shall be renewed. All weather stripping and thresholds shall be renewed. Trap doors shall be re-installed and adjusted for proper operation.

### 1.2.11 Safety Appliances and Handholds

Inspect and overhaul all interior and exterior stair handholds and verify that all safety appliances meet all current FRA Safety Appliances regulations.

### 1.2.12 Diaphragms and Safety Curtains

Remove safety curtains and housings. The empty tapped holes in collision posts shall be filled with decorative buttons or pan head fasteners before repainting.

All diaphragms shall be renewed. In the Carbody Overall Overhaul Plan, the Contractor shall submit mounting overhaul and installation procedures approval.

## 1.3 REQUIRED CDRLS

101 Carbody Overall Overhaul Plan to the Administration for approval

~~102 Criteria for replacement of window glazing and replacement material specifications and designs~~

103 Submittal of design and installation procedures for stepwell surfaces

104 Submittal of design modification for trap door heater wiring

# SECTION 02

# TRUCKS AND SUSPENSION

# SECTION 02
# TRUCKS AND SUSPENSION

**Section** **Page Number**


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# SECTION 02
# TRUCKS AND SUSPENSION

## 2.1 GENERAL SYSTEM DESCRIPTION

Existing trucks are four-wheel, steel fabricated, outboard frame, with roller bearings, currently qualified to run at all MARC operational speeds up to a maximum speed of 125 mph.

The truck frames and bolsters are made of low alloy high tensile steel plate. The car is supported by two air springs per truck. The air springs are located on top of the truck bolsters. Leveling valves are mounted under the car body with linkages connected to the bolsters. There is one leveling valve per truck. Primary suspension units are coil inner and outer spring sets, with the outer coil spring incased in rubber. There are four primary spring sets per truck. Primary springs are located between each of the axle journal bearing assemblies and the truck frame.

Journal bearings are Timken class F (AP) lubricated tapered roller bearings. All journal bearings include a 100-tooth gear wheel for magnetic speed sensors.

Each truck has four friction brake units with two friction rings mounted to each axle. A truck also has four tread brake units

## 2.2 OVERHAUL REQUIREMENTS

The trucks shall be overhauled per OEM procedures, qualifications, and criteria.

The contractor shall submit a Truck Overall Overhaul Plan to the Administration for review and approval. **[CDRL 201]** The plan shall include all procedures for repair and subsequent stress relieving of the truck frame. The Truck Overall Overhaul Plan shall include all procedures to repair welds and cracks. Cracks shall be unacceptable, regardless of size or location. All weld repairs shall be in accordance with OEM requirements and applicable AWS codes.

All parts of the trucks and related assemblies, not described herein, shall be thoroughly cleaned and overhauled. Trucks shall be re-assembled in accordance with OEM requirements and performance criteria.

Overhauled trucks shall be complete with all equipment. The Contractor shall furnish all labor and unless specified, all material required, including the repair and replacement of all damaged or missing parts.

All work performed on and material applied to, overhauled trucks shall be in compliance with the most recent release of the AAR Wheel and Axle Manual and the AAR Roller Bearing Manual, including all amendments.

Where specific work is required to be performed per items above, the work shall be performed in AAR certified facilities. The Contractor shall not be permitted to use alternative shops to perform the work without prior Administration approval.

## 2.3 RECONFIGURATION

The Contractor is responsible for ensuring the overhauled truck and suspension system configuration is in compliance with the latest OEM specifications and requirements. The Contractor shall revise the appropriate As-Built drawings and documentation (as required in TS TS Section 17, Management and Support Systems within this Specification) to ensure configuration control; and that the proper documentation reflects all changes made to the As-Built configuration. This may include, but is not limited to OEM equipment/components, design modifications/upgrades, and approved modification/upgrades performed during this overhaul.

## 2.4 SCOPE OF WORK

The truck system overhaul shall be in accordance with OEM requirements and performance criteria. All inspection; testing; assembly and disassembly; repair and/or replacement of components; and adjustment and lubrication, as applicable, shall be in strict compliance with the OEM recommendations.

### 2.4.1 Frame

Frames shall be abrasive blasted clean to bare metal, removing all corrosion, and then visually inspected for damage. Openings shall be masked to prevent damage from abrasive media. After inspection the frames shall be immediately painted in accordance with the OEM's process and paint specification.

Frames shall be magnafluxed per ASTM-E-709.

Frames shall be trimmed for proper alignment. Proper alignment is defined as the difference in diagonal measurements being less than 1/16 inch. Tram points shall be permanently identifiable.

Incorrect tram shall be corrected using industry accepted methods. Tram procedure(s) shall be submitted to the Administration for review and approval before any actual work.

All critical dimensions of each truck frame shall be measured and recorded. The recorded dimensions shall be included as part of the Car History Book.

Mounting holes shall be cleaned and repaired as required.

Threads in tapped holes shall be repaired as required.

Spring pockets or spring suspension counter bores and mounting holes requiring repair shall be built up with weld. Reamed holes and seats shall be restored.

Tramming marks shall be restored.

Center bearing pin bushing shall be renewed.

Side bearing friction plates shall be renewed in sets as specified by the OEM for MARC operational speeds. Side bearing friction plates shall be conditioned for coefficient of friction as specified by OEM using OEM recommended equipment. Appropriate shimming shall be applied or removed per OEM procedures for wheel diameter compensation.

Journal box hangers shall be removed, cleaned, inspected, and repaired if found damaged. If the journal box hanger is beyond repair, it shall be replaced.

Journal box hangers shall be returned to original truck position after overhaul or replacement.

Special care and inspection shall be given to the radius arm seat and bolt holes. Damaged seats and bolt holes shall be weld repaired and re-machined. As part of the Truck Overall Overhaul Plan, the Contractor shall develop a procedure to repair the welds, and re-machine the seats.

A. **Name and Number Plates.** Existing name plates shall be removed, cleaned, repainted and reapplied. Damaged or missing name plates shall be replaced.

   Existing number plates shall be removed, cleaned, repainted and reapplied. Damaged or missing number plates shall be replaced. Number plates shall be masked until all painting on the truck is completed.

B. **Radius Arm Caution Plate.** Four red "radius arm torque value" caution plates shall be applied to each truck after all painting on the truck is completed. The location of the Caution Plate shall be in accordance with OEM.

### 2.4.2 Bolster

Bolsters shall be abrasive blasted clean to bare metal, removing all corrosion, and then visually inspected for damage. Openings shall be masked to prevent damage from abrasive media. After inspection the frames shall be immediately painted in accordance with the OEM's process and paint specification provided in TS Section 3.11.2.

Bolsters shall undergo a dimensional measurement inspection. All results shall be measured and recorded. The recorded dimensions shall be included as part of the Car History Book.

Bolsters shall be magnafluxed per ASTM-E-709.

Bolsters shall receive a 100% magnetic particle inspection in all welds. All welds shall be of an acceptable quality otherwise subject to repair.

Any crack shall be unacceptable, regardless of size or location. All weld repairs shall be in accordance with AWS applicable codes.

All mounting holes shall be repaired as required.

Steel wear plates shall be inspected and repaired or replaced as necessary per the OEM procedures. Existing body side bearing plates may be re-machined flat removing a maximum of 0.125 inches of the original plate thickness. The stainless wear plates shall be re-welded to AWS procedures and sealed per OEM instructions. All welding processes shall be to OEM procedures and criteria and meet AWS standards.

Existing center casting portion of bolster and frame shall be overhauled to OEM dimensions.

Lateral Shock Absorber shall be replaced with OEM or Administration approved equivalent.

Replace lateral bumpers with OEM or Administration approved equivalent.

Hanger plates and pins shall be inspected for damage and repaired as required. Cotter pins shall be replaced.

### 2.4.3 Bolster Anchor Rods

Existing bolster anchor rod assemblies shall be overhauled. All bolster anchor rod rubbers are to be replaced if found worn, or damaged. Reinstall new rubbers per OEM procedures. Inspect bolster anchor rod for cracks, distortion, or other damage. Repair or replace damaged bolster anchor rods.

### 2.4.4 Radius Arms

The radius arm assembly shall be overhauled per OEM procedures. Note: the two halves of the radius arm are serialized. They two halves are match drilled as a set, and shall not be interchanged with halves from other radius arms.

Radius arm rubbers shall be replaced ~~if found worn, or damaged~~.

All cotter pins, nuts, and bolts shall be replaced.

The drilled bolt used in the attachment of the end cap to the radius rubber holder shall have a hole sufficient for the cotter pin and shall not affect the strength of the bolt.

Existing roller bearing seats of the radius arms shall be cleaned, inspected, and overhauled in accordance with the OEM recommendations ~~or shall be renewed~~.

### 2.4.5 Journal Bearings and Boxes

All journal bearings shall be removed and overhauled in accordance with OEM procedures and methods by an AAR certified facility. If the journal bearing cannot be re-conditioned it shall be renewed with an OEM bearing. **For estimating purposes, it is anticipated 5% of bearings shall be replaced.**

All bearings, whether new or rebuilt, shall be fully lubricated with grease meeting AAR specification M-942 latest revision. Bearings shall not require any field lubrication.

Lubricant fitting shall be removed and a plug applied in the axle end cap.

Toothed gear wheels for speed sensors shall be cleaned, inspected and repaired if damaged.

Bearings that are not needed to complete trucks shall be overhauled and returned to the Administration.

### 2.4.6 Wheels and Axles

All wheels shall be replaced with new wheels in accordance with the requirements of this section and in accordance with AAR Manual of Standards and Recommended Practices for Wheels and Axles, Section G.

New wheels shall be a nominal 36 inches in diameter, with flange angle and tread profile in accordance with APTA 340 (APTA SS-M-015-06), and conforming to AAR #B-36 heat treated wrought carbon steel, multiple wear type.

New wheels shall be manufactured to AAR Standards and shall conform to the current revisions of Title 49 CFR Part 238.119 and APTA SS-M-012-99, Standard for the Manufacture of Wrought Steel Wheels for Passenger Cars and Locomotives.

Wheels shall have undersize bores to permit maximum re-use of existing axles.

New wheel sets shall be grouped and applied in truck sets.

New Wheels shall be dynamically balanced to within 0.50 pounds-force (0.23 kg) at the outside diameter of the rim. Balancing shall be achieved by machining the wheel.

Detail drawings and specifications for the new wheels shall be submitted to the Administration for approval. **[CDRL 202]**

Journal seat repairs may be made by the electro-chemical deposition process if done within the scope of rule 2A-5 of the AAR Wheel and Axle Manual.

Reject Axles shall be replaced with new axles. **For estimating purposes, it is anticipated 12 axles will require replacement.**

Reject Axles shall be stored and protected until released for disposition by the Administration.

A permanent record shall be kept of all wheel pressings, serial numbers, axle stampings, tape sizes, tonnage and all other dimensions taken, including runout readings. The records shall be included in the car history book.

### 2.4.7 Suspension

A. **Primary Suspension.** The existing primary spring is a nested matched set of inner and outer coil springs. The outer coil spring is a rubber coated steel coil spring that has non-linear spring rate characteristics.

Existing rubber coated coil springs shall be ~~inspected for damage and replaced if bulged, torn, peeled, or cracked with OEM or Administration approved equivalent. Replacement springs shall meet the exact OEM specifications. Replacement primary springs shall be free issued by the Administration.~~ **replaced with OEM springs**.

During car leveling, primary spring empty weight installed heights shall be shimmed to OEM requirements using OEM procedures. All resulting measurements shall be recorded on forms and included as part of the Car History Book.

Primary springs not meeting the installed measurement requirements shall be removed and replaced.

Primary springs shall have markings indicating the manufacturer and date of manufacture on outside surface of one end of each rubber coated spring coil.

An OEM or Administration approved equivalent design top cap shall be placed on the truck frame hole above the primary spring to prevent debris entering the seat and spring assembly. The top cap shall not be easily removed by hand.

B. **Secondary Suspension.** Existing air springs shall be inspected for damage and replaced in accordance with OEM procedures and criteria.

1. The Administration shall free issue replacement air springs to the Contractor.
2. O-rings shall be replaced when replacing air springs.
3. Existing air spring adapter plates shall be overhauled.
4. All air suspension hoses shall be replaced.

C. **Leveling Valves, Compensating Valves, and Double Check Valve.** See Air Brake TS Section 4 for secondary suspension leveling valves and associated pneumatic components.

### 2.4.8 Electrical, Electrical Conduit, and Piping

**Any PTC related truck equipment including speed sensors, axle generators associated wiring and junction boxes shall be overhauled. The MTA does not expect replacement of any PTC related equipment.** ~~New magnetic wheel slide speed sensor cable assemblies shall be installed.~~

~~New event recorder/alerter and automatic announcement system speed sensor shall be installed.~~

~~A new axle generator shall be installed as part of the new 9-aspect cab signal/ATC system installation work being performed by WABTEC with their PTC installation program.~~

A. **Electrical Conduit.** Existing conduits, junction boxes and fittings shall be removed and inspected. Any damaged parts shall be replaced with new OEM material.

   Terminals, cables, and connectors shall be cleaned and inspected. Any damaged parts shall be replaced with new OEM material.

   All magnetic speed sensor cables shall include the following:

   1. All speed sensor and cable assemblies shall have a fixed pigtail with integral environmentally sealed connection at the sensor.
   2. New cable clamps shall be installed to securely retain the cable arrangement on the truck frame.
   3. Cable clamps and cable routing shall be arranged to permit the full range of truck rotation relative to the carbody and maximum dynamic vertical displacement of the journal boxes relative to the truck frame.
   4. The cable shall have a quick disconnect, Canon style plug connector. The proposed speed sensor cables and installation shall be submitted for Administration review and approval. **[CDRL 203]**

B. **Air Piping.** Existing air piping shall be cleaned inside and outside and capped to prevent contamination from entering. Any damaged, bent, dented air piping shall be replaced. Replacement piping shall be seamless steel tubing per ASTM A53 SEAMLESS GRADE B.

   Pipe clamps, fittings and unions shall be cleaned and overhauled. If any part cannot be repaired it shall be replaced.

   All air leaks shall be repaired.

### 2.4.9 Brake Equipment

Brake equipment overhaul including the removal of the sanding system shall be covered in Air Brake TS Section 4.

### 2.4.10 Electrical Grounding

Axle end grounding contacts shall be ~~overhauled or replaced~~ **renewed**. Carbon brushes shall be ~~replaced~~ **renewed**. Spring supports shall be ~~replaced~~ **renewed**. Sealing O-ring shall be ~~replaced~~ **renewed**.

All ground straps and their fasteners shall be replaced with OEM material. Appropriate conductive grease shall be applied at all bolted connections.

### 2.4.11 Painting

Before re-assembly of the truck, one coat of approved metal primer shall be applied to all individual metal parts.

A final coat of approved silver enamel truck paint shall be applied. The paint shall not conceal cracks that may develop in service. Care shall be taken to mask off areas of the radius arm seat from paint. The proposed paint shall be subject to Administration approval.

Wheels, axles, exposed rubber and name/number plates shall not be painted.

### 2.4.12 Lubrication

All truck, handbrake and air brake components requiring lubrication shall be lubricated before shipment of cars.

Truck parts shall not be lubricated during truck assembly.

Journal bearings are to be lubricated by the AAR certified roller bearing repair shop.

### 2.4.13 Carbody Leveling

Leveling the trucks and carbody shall be done on straight, level, tangent track. The track shall be solidly supported with the top elevation of the track maintained within 0.125 inches tolerance at all truck and wheel centers.

The Contractor shall submit the car leveling procedures for Administration review and approval **[CDRL 204].**

## 2.5 SPARE TRUCKS

~~The Administration has eight (8) spare truck assemblies (truck frame and bolster) that shall be part of this scope of work. The Contractor shall build complete, ready to run truck assemblies with those components. The spare trucks shall be capable of MARC operational speeds, using the procedures and required processes as identified this Specification.~~

~~The Contractor shall be responsible for providing all missing material to produce complete ready-to-run truck assemblies, including but not limited to, wheels, axles, roller bearings, brake equipment, brake actuators, piping, wiring, primary springs, elastomeric elements and air springs.~~

~~Spare trucks shall be used as floats and installed on completed cars during the course of this project.~~

**The Administration has eight (8) spare truck assemblies (truck frame and bolster) that shall be overhauled as part of this scope of work. The eight (8) spare truck frames and bolsters may be used as float material during the course of the project. The components shall be overhauled as applicable and reassembled in the as-provided configuration and returned over the course of the project.**

## 2.6 REQUIRED CDRLS

201 The contractor shall submit a Truck Overhaul Plan.

202 Detail drawings and specifications of the proposed new wheel replacements.

203 The proposed speed sensor cable and installation.

204 The Contractor shall submit the car leveling procedures.

# SECTION 05
# ELECTRICAL

# SECTION 05
# ELECTRICAL SYSTEM

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# SECTION 05
# ELECTRICAL

## 5.1 GENERAL SYSTEM DESCRIPTION

This section describes the various pieces of existing and new apparatus, panels and switches that perform the required electrical functions on the car.

The electrical system comprises both the low voltage and high voltage power distribution and control components. The high voltage power system is at a nominal 480 VAC and receives power from the locomotive. The high voltage system supplies power to the HVAC heaters and compressor, blower motors, and transformers. The vehicle provides auxiliary power at a nominal 120VAC. The low voltage system is at a nominal 74 VDC and receives power from the vehicle's battery charger and from the storage batteries. The low voltage system supplies power to systems, which include doors, lights, HVAC, and brakes.

**Vehicle Voltages**

The vehicles have three distinct voltage systems, as follows:

A. 74 VDC battery (64 VDC, nominal) – derived from the 480 VAC buss through a LVPS/BC or transformer rectifier and typically used for "local" vehicle control and car function DC trainline commands.

B. 120 VAC, 60 Hz – derived from the 480 VAC HEP trainline buss through isolation transformers and typically used for low voltage functions such as lighting, convenience outlets and HVAC controls.

C. 480 VAC 60 Hz – HEP trainline power obtained from the powering locomotive and typically used for HVAC power, floor heat and is the source for the 74 VDC and 120 VAC circuits. Single phase, phase reversal, and ground fault protection is not currently provided on each car. The Contractor shall add these features to the 480 VAC system

Locomotive Supplied HEP Power Quality:

A. The HEP power supplied by the MARC diesel locomotive fleet is generated by an independent diesel engine-alternator package producing 3-phase, 480 VAC, 60 Hz power with 1% THD (Max), over a voltage and frequency range of 475-485 VAC and 59-61 Hz, respectively.

B. The HEP power supplied by the MARC electric locomotive fleet is generated by a static inverter package (GTO or IGBT) producing 3-phase, 480 VAC, 60 Hz power with 5% THD (Max), over a voltage and frequency range of 470-490 VAC and 59-61 Hz, respectively.

C. Any new component applied to the vehicle systems shall be designed to use this type of power.

## 5.2 OVERHAUL REQUIREMENTS

The overhaul requirements are discussed in the sections below; base scope of work, modifications, additions and options are also discussed in sections below. The Contractor shall submit an Electrical Overall Overhaul Plan for the electrical system inspection, and testing to the Administration for approval. **[CDRL 501]**

In general, the Contractor shall overhaul the electrical system per OEM specifications and requirements.

### 5.2.1 Switch and Circuit Breaker Panel and Compartment

All switch and circuit breaker panels and compartments shall be cleaned, inspected and overhauled.

All switches shall be inspected and tested. Any device not functioning in accordance with its intended purpose shall be renewed with OEM material.

All circuit breakers shall be inspected and tested. All circuit breakers' thermal and magnetic trip overload protection portions shall be inspected and tested. Any device not functioning in accordance with its intended purpose shall be renewed. The Contractor shall estimate that five (5) DC and five (5) AC circuit breakers will need to be renewed on a per car basis.

All wiring on the panels shall be inspected for damage (burns, pinch points, broken conductors, splices, etc.) and renewed.

All broken or illegible nameplates shall be renewed.

All panel wiring shall meet all recommendations of APTA RP-E-002 (latest revision).

All new circuit breakers shall be sized in accordance with NEC requirements.

### 5.2.2 Auxiliary Transformer

All auxiliary transformers shall be cleaned, inspected and tested.

All transformer installation brackets shall be cleaned, inspected and overhauled.

Any defective transformer shall be renewed. The Contractor shall estimate that ten (10) transformers will need to be renewed on a per fleet basis.

### 5.2.3 Convenience Outlets

All outlets shall be replaced and shall have stainless steel covers plates.

The outlets shall meet all requirements of the latest revision of Section 4.6 in APTA SS-E-005 (latest revision) and IEEE Std. 16.

Wiring shall be installed by the Contractor to accommodate any new GFI outlet circuits.

The convenience outlets boxes shall be cleaned, inspected, and renewed.

All outlet wiring shall be inspected for damage. All damaged wiring shall be renewed.

**As an OPTION,** the Contractor shall provide a proposal to the Administration, with a cost and design concept for installation of a GFI protected duplex or strip electrical outlet at each seat location. **[CDRL 502]**

At a minimum, the Contractor's design concept shall show the outlet's location at the seat (side wall or seat pedestal); different seats may require different installation locations.

The Contractor shall also provide an estimate of the vehicle's increased power demand, (assume 50% usage by a laptop PC at each seat row)

### 5.2.4 74 VDC Low Voltage System

**A**. **Batteries.** The batteries shall be cleaned, inspected and tested to the OEM procedures.

Batteries shall be renewed if they are two (2) years or older than from the Contract Award date or having fail the OEM testing requirements. The Contractor shall estimate that ten (10) car set of batteries will need to be renewed on a per fleet basis.

All batteries shall be charged in accordance with the OEM's procedures before the vehicles are shipped back to the Administration**.**

**B. Battery Boxes and Trays.** All battery boxes shall be cleaned, inspected and repaired as necessary.

All battery box hinges and latches shall be cleaned, inspected and lubricated. If any latch is found to be defective it shall be renewed.

All battery trays shall be cleaned and inspected and repaired as necessary.

All battery tray roll-out mechanisms shall be renewed.

All battery inter-cell cables shall be renewed.

The vehicle battery leads within the battery box shall be inspected for damage and renewed as necessary. These leads shall be properly supported at the rear of the battery box so as not to be pinched between the battery box rear wall and the battery tray frame.

**C. Low Voltage Power Supply/Battery Charger.** All LVPS/BC's shall be removed from the vehicles and returned to the product OEM for re-qualification and or repair.

The LVPS/BC OEM manufacturer shall renew all electrolytic capacitors and fuses.

The OEM shall perform a dielectric test on the transformer and filter inductor. Any transformer or inductor that fails shall be renewed.

### 5.2.5 Relays, Contactors and Other Components

All relay and contactors shall be cleaned, inspected and tested to ensure functionality at the device's nominal operating voltage.

All contactors, transfer switches, etc., with renewable contact tip shall have them renewed.

All discrete passive devices (isolation diodes, resistors, MOVs, free-wheeling diodes, capacitors, etc.) shall be renewed.

~~All passenger compartment overhead and floor heating elements shall be cleaned, inspected and tested. All space heater modules (Operator, Observer and toilet compartment) shall be cleaned, inspected and tested.~~ Any damaged or failed components shall be renewed. See any additional requirements as noted in TS Section 15.

All magnet valves and pressure switches shall be renewed. See any additional requirements as noted in TS Section 04.

All cab signal/ATC axle generators shall be replaced with new PHW cab signal/ATC axle generators with a minimum of two (2) speed sensors. The Contractor shall install any additional wiring that may be required.

All end-of-axle ground brush assemblies shall be renewed. All ground straps and cables shall be renewed. This includes but is not limited to the following:

A. Carbody-truck frame;

B. Truck frame –bolster;

C. Truck frame-journal box;

D. Journal box-axle ground brush.

All indication light circuits actuated by means of a micro-switch (hand brake and Toilet Occupied) shall be cleaned, inspected and tested. Any failed component shall be renewed.

All bells, alarms and buzzers throughout all vehicle types shall be replaced.

All hand dryers in the toilet compartment shall be replaced with Excel "XLERATOR" Model XL-SB hand dryers.

All trap door heating elements and wiring shall be renewed back to each door location's junction box.

### 5.2.6 Wire and Cable

All wire and cable used by the Contractor shall conform to the requirements of TS Section 15.

### 5.2.7 Electro-Magnetic Compatibility (EMC)

The Contractor shall follow the EMC requirements provided in TS Section 0.10.

### 5.2.8 Terminal Strips

All terminal strips shall be cleaned and inspected.

Damaged or deteriorated terminal strips and device identification labels shall be renewed.

Replacement terminal strips shall be revenue service-proven and comply with all recommendations of the latest revision of Section 4.6 in APTA RP-E-002 (latest revision).

Illegible terminal strip markings and device identification labels shall be renewed.

### 5.2.9 Trainlines (Reference Tables T 05-1 and T 05-2)

**A.** **Locomotive Control.** The two (2) BLACK MU Control receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle assemblies shall be Clement National CRA-27180-MU-BK **or approved equal**. Receptacle covers shall be marked with 1 inch white stencil lettering, "MU". New OEM wire markers shall be applied when the MU trainlines wires are re-terminated in the trainline junction boxes

The two (2) YELLOW MU DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-MU-Y **or approved equal**. Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY"

One (1) new BLACK MU trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-MU-BK **or approved equal**.

**B.** **Door and Communication.** The two (2) BLUE COMM receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle assemblies shall be Clement National CRA-27180-AMTK **or approved equal**. Receptacle covers shall be marked with 1 inch white stencil lettering, "COMM". New OEM wire markers shall be applied when the COMM trainlines wires are re-terminated with OEM terminals in the trainline junction boxes.

The two (2) WHITE COMM DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-AMTK-W **or approved equal**. Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY".

One (1) new BLUE COMM trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-AMTK **or approved equal**.

**C.** **Head End Power.** The four (4) fixed Head End Power (HEP) single ended trainline jumpers shall be renewed. The HEP jumper assemblies shall be Clement National MPA-1SR-0128 **or approved equal** and shall be colored RED.

The four (4) HEP receptacle housings shall be inspected, cleaned and repaired as needed. The HEP receptacles are the locking type, Clement National MRA-BH **or approved equal** and shall be colored RED.

The four (4) HEP receptacle assembly inserts shall be renewed. The HEP receptacle inserts shall be Clement National MRA-1-0077 **or approved equal** and shall be colored RED.

The HEP cable pigtails shall be long enough to be spliced back into the carbody mounted HEP cabling behind the step wells; these splices are the only ones permitted on the vehicles.

1. The splices shall use a two (2) bolt connection covered with two layers of heat-shrink tubing with sealant.

2. A new protective rubber sleeve tube from PowerRail Distribution Inc., (p/n E8350968) shall then be applied over each splice which will be secured at each end by means of an appropriate diameter stainless steel hose clamp.

New "DANGER 480 VOLT" decals shall be applied adjacent to the HEP receptacles and jumper assemblies, in the same location as originally installed.

The Phase rotation of the 480 VAC cabling on the cars shall be maintained. It shall be 1 – 2 – 3 in the counter-clockwise direction when looking into the MALE HEP receptacle on either end of the car.

For HEP load balancing, within the HEP trainline junction box, the HEP phases will be rotated by one phase going to the F/B-end of the car, i.e. P1 to P2, P2 to P3 and P3 to P1

When the HEP cabling is re-terminated using OEM terminals at the HEP junction boxes, new OEM style wire markers and heat shrink Phase Color Coding bands shall be applied. The color coding of the HEP cables for each phase, 1, 2, and 3 shall be determined during the design reviews.

The HEP Trainline Control wiring shall only use Pin 1 from end to end for the Trainline Complete Circuit. Within the MU and COMM trainline junction boxes, HEP Control Pins 2 and 3 shall be grounded coming from the carbody receptacle and jumper end, and shall not be connected coming from the opposite end of the car's MU and COMM junction boxes.

### 5.2.10 Junction Boxes

All junction boxes (exterior and interior) shall be cleaned and inspected.

Any interior paint which is damaged shall be repaired with an Administration approved WHITE insulating paint. Exterior paint shall be repaired as appropriate.

All box cover gaskets shall be renewed.

All box cover fasteners and hardware shall be renewed.

### 5.2.11 Trainline Wiring

All exposed trainline wiring (including the 480 VAC HEP cabling run in the undercar wire trays) shall be cleaned and inspected for damage. Any damaged or previously repaired wire or cabling shall be renewed. Splices are prohibited.

All trainline wiring (MU, COMM and HEP) shall be tested for grounds. All trainline wiring shall have an insulation resistance to ground tested as per the requirements of APTA SS-E-001. Any wiring not having this level of insulation resistance shall be renewed.

Continuity tests shall be performed on every car, after completion of assembly and equipment installation, to confirm that:

A. Continuity exists between all intended contacts of all receptacles;

B. Continuity exists between trainlines and each vehicle connection to the trainline circuit;

C. Continuity exists from one end to the other of all spare wires;

D. No wires are unintentionally grounded (this includes spares);

E. No wires are shorted or cross connected to unintended circuit.

Each conductor of each trainline shall be exercised to ensure the equipment to which it is connected transmits/receives the trainline signal correctly.

| Pin F/B-End | Pin A-End | Function | Marker | Size AWG No. |
|---|---|---|---|---|
| 1 | 1 | 11kV-25Hz (Tap Changer) | 1T | 12 |
| 2 | 2 | Alarm (SG) | 2T | 12 |
| 3 | 3 | D Valve-Engine Speed (DV) | 3T | 12 |
| 4 | 4 | Negative (N) | 4T | 10 |
| 5 | 5 | Emergency Sand (ES) | 5T | 12 |
| 6 | 6 | Generator Field (Motor Control) (GF) | 6T | 12 |
| 7 | 7 | C Valve-Engine Speed (CV) | 7T | 12 |
| 9 | 8 | Forward (FO) | 8T | 12 |
| 8 | 9 | Reverse (RE) | 9T | 12 |
| 10 | 10 | Wheel Slip (WS) | 10T | 12 |
| 11 | 11 | Auto Power Reduction | 11T | 12 |
| 12 | 12 | B-Valve-Engine Speed (BV) | 12T | 12 |
| 13 | 13 | Positive (PC) | 13T | 10 |
| 14 | 14 | Pantograph DOWN / Fuel Pump | 14T | 12 |
| 15 | 15 | A Valve-Engine Speed (AV) | 15T | 12 |
| 16 | 16 | Engine Run (ER) | 16T | 12 |
| 17 | 17 | SPARE | 17T | 12 |
| 18 | 18 | 25kV-60Hz (Tap Changer) | 18T | 12 |
| 19 | 19 | Traction Motor Excessive Current Indication | 19T | 12 |
| 20 | 20 | Dynamic Brake Warning (Diesel) | 20T | 12 |
| 21 | 21 | SPARE | 21T | 12 |
| 22 | 22 | SPARE | 22T | 12 |
| 23 | 23 | Manual Sand (SA) | 23T | 12 |
| 24 | 24 | SPARE | 24T | 12 |
| 25 | 25 | SPARE | 25T | 10 |
| 26 | 26 | Fault Reset | 26T | 12 |
| 27 | 27 | No Power Brake Indication | 27T | 12 |

NOTE:

1. Wire crossovers (8/9) are to be made at F/B-End of car.

**TABLE T 05-1**

**Locomotive MU Control Train Line**

**Pin Assignments, Wire Markers, and Wire Sizes**

| Pin F/B-End | Pin A-End | Function | Marker | Size AWG No. |
|---|---|---|---|---|
| 1 | 1 | PA Wire SHIELD | PAS | 12 |
| 2 | 2 | Car Battery NEGATIVE | TB | 10 |
| 3 | 3 | PA Audio | PA1 | 14 |
| 4 | 4 | PA Audio | PA2 | 14 |
| 5 | 5 | IC Audio | PA3 | 14 |
| 6 | 6 | IC Audio | PA4 | 14 |
| 7 | 7 | PA Control | PA5 | 14 |
| 8 | 8 | PA Control | PA6 | 14 |
| 9 | 9 | Radio | VC1 | 14 |
| 10 | 10 | Radio | VC2 | 14 |
| 11 | 11 | SP-1 (EP Brake Application - Future) | SP1 | 12 |
| 12 | 12 | SP-2 (EP Brake Release - Future) | SP2 | 12 |
| 13 | 13 | Emergency Brake | EB | 12 |
| 15 | 14 | Door Control Right OPEN | D1 | 12 |
| 14 | 15 | Door Control Left OPEN | D2 | 12 |
| 17 | 16 | Door Control Right CLOSE | D3 | 12 |
| 16 | 17 | Door Control Left CLOSE | D4 | 12 |
| 23 | 18 | Engineer's Door CLOSED Light | DC1A | 12 |
| 19 | 19 | Handbrake Release Light | BRB | 12 |
| 20 | 20 | Engineer's Brake Applied Light | BAB | 12 |
| 21 | 21 | Door Override | DOR | 12 |
| 22 | 22 | Conductor's Door Signal Buzzer | CS | 12 |
| 18 | 23 | Conductor's Door CLOSE Light | DC2A | 12 |
| 24 | 24 | Trainline Information System | ER1 | 14 |
| 25 | 25 | Trainline Information System | ER2 | 14 |
| 26 | 26 | Conductor's Door CLOSE Light | BLS | 12 |
| 27 | 27 | No Motion | ZS | 12 |

NOTE:

1. Wire crossovers (14/15, 16/17 and 18/23) are to be made at F/B-end of the car.
2. Shield terminations are to be made at the F/B-end of the car.
3. Wires 3&4, 5&6, 7&8, 9&10 and 24&25 are to be 2-conductor, Twisted-Shielded Pairs.
4. Wires 11 and 12 are provisions for FUTURE conversion to EP Brake.

**TABLE T 05-2**

**Door & Communication Control Train Line**

**Pin Assignments, Wire Markers, and Wire Sizes**

## 5.3 REQUIRED CDRLs

501 The Contractor shall submit an Electrical Overall Overhaul Plan to the Administration for approval.

502 The Contractor shall provide a proposal to the Administration, with a cost and design concept for installation of duplex or strip electrical outlet at each seat location.

# SECTION 10
# HVAC

# SECTION 10
# HEATING, VENTILATING AND AIR CONDITIONING (HVAC) UNIT AND CONTROLS

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# SECTION 10
# HEATING, VENTILATING AND AIR CONDITIONING (HVAC) UNIT AND CONTROLS

## 10.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with HVAC package units located on the roof at each end of the vehicle. The HVAC System specification for each unit is:

A. Voltages: 480 VAC/3 phase, 120 VAC, 24 VDC
B. Weight: 1,975 Pounds (898 Kgs.)
C. Overhead heating capacity: 24 kW per unit
   1. Two 12 kW Stages
   2. Open coil elements
D. Refrigerant Type: R-22, 14 lbs/unit
E. Cooling Capacity: 10.5 Tons (126,000 btu/hr) per unit
   Two 5.25 Ton Refrigerant Circuits
F. Air Flow: 1,800 CFM per Unit (600 CFM Fresh Air)
   A Temperature Control Panel automatically maintains the car interior temperature between 69 and 73 of the vehicle by providing necessary levels of heating and cooling powers.

## 10.2 OVERHAUL REQUIREMENTS

Much of the existing HVAC equipment shall be retained and overhauled. Overhauling requirements are discussed in the sections below; base scope of work modifications, additions and options are also discussed in sections below. The Contractor shall submit an HVAC Overhaul Plan to the Administration for review and approval prior to starting the overhaul **[CDRL 1001]**.

## 10.3 SCOPE OF WORK

### 10.3.1 Temperature Controller

The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with a **Vapor Temperature Control Unit (part no. ~~2010400017~~ 201040017) or an Administration approved equivalent** microprocessor controller compatible with the existing control voltages and control logic developed by the OEM. The contractor shall provide a minimum three spare digital inputs and outputs and one spare analog input and output on the controller. The microprocessor controller shall be capable of detecting and logging system faults which may be retrieved by maintenance personnel using a portable test unit (PTU) supplied by the contractor. The retrieved fault logs shall be in file format that is compatible with Microsoft Excel. The controller shall have sufficient RAM memory to store faults logged

between regular six-month maintenance intervals as agreed with the Administration. If the fault storage reaches capacity the existing faults shall be overwritten on first in first out (FIFO) sequence. The fault logs shall be capable of being cleared by the PTU. Active faults shall be indicated and displayed on or in close proximity to the microprocessor controller for convenient viewing by the crew or maintenance personnel without the use of a PTU. The contractor shall provide a list of faults that will be detected and stored by the microprocessor controller to the Administration for approval. **[CDRL 1002]** The methodology of detecting the faults shall be presented for approval as part of the HVAC controls design review.

The contractor shall submit the following documents during the design reviews for approval by the Administration. The documents shall comply with the requirements of TS Section 16.2, and CDRL 1601:

1. Software Requirements Specification (including list of faults)
2. Software Development Plan
3. Software Quality Plan
4. Software Validation Test Plan

### 10.3.2 HVAC Control Panel

The control panel shall be removed and cleaned. All contactors, overloads and control devices shall be renewed. Circuit breakers shall be cleaned and tested. The renewed panel shall be tested to the OEM requirements.

### 10.3.3 HVAC Unit

**Air Conditioning System.** The existing air conditioning system is rated for operation on nominal 480 VAC, 3-phase 60 Hz power and 120 VAC supplied by the existing fleet of MARC locomotives. The existing HVAC units were originally manufactured by Stone Service Corporation. The existing system utilizes refrigerant R-22. The existing system shall be modified and designed for use with refrigerant R-407c **or R-410a**. The contractor shall present details of any required unit modification for the refrigerant change to the Administration for review.
The HVAC unit shall be inspected and unless otherwise specified, items such as mounting studs, mounting brackets, covers, clamps, weld nuts, threaded inserts; support bars, latches, drain tubes, and other components that may be found to be worn or damaged shall be overhauled or renewed. All resilient mounts shall be renewed. Unless otherwise specified all mounting hardware shall be renewed.

The HVAC Unit and carbody brackets shall be inspected and repaired if damage is found.
All HVAC unit cover and vehicle interface sealing gaskets shall be inspected for permanent set and poor adhesion to the cover or unit. If defects are found, the cover or unit substrate shall be cleaned and the gasket renewed.

### 10.3.4 Condenser-Compressor Section

The compressor-condenser section of the unit shall be inspected for damage and cleaned. The condenser section cover shall be inspected for damage and cleaned. All insulation shall be renewed. All insulation substrates shall be cleaned prior to the application of adhesive for the renewed insulation.

The scroll compressors shall be replaced with new scroll compressors that are sized for and compatible with the R-407c **or R-410a** replacement refrigerant. The compressor isolation mounts and hardware shall be renewed. All Rotolock fittings shall have their seals renewed. The compressor crankcase heaters shall be renewed. Vibration eliminators shall be cleaned inside and out and inspected for damage.

The condenser coils shall be replaced with new. The new coils shall have the same dimensional features and performance criteria as the OEM coils. The frame and center support shall be constructed of stainless steel and the end plates shall be pierced and flared to support the tubes. The tube and fin material shall be copper. The tubes shall be mechanically expanded to secure the fins. The coils shall be pressure tested in accordance with the OEM requirements. All condenser section piping shall be inspected for wear or damage and cleaned inside and out. Particular attention should be given to clamped and pass-through areas during inspection. All flexible refrigerant hoses shall be replaced with low-permeation hose. All service valves, shut off valves, and check valves shall be renewed.

All elastomeric material used for piping clamps and pass-through grommets shall be renewed. The condenser fan shall be inspected cleaned and inspected. The condenser fan motor and hardware shall be renewed. The fan and motor assembly shall be balanced in accordance with the OEM requirements. Electrical conduit gaskets shall be renewed.

### 10.3.5 Evaporator Section

The evaporator section of the HVAC unit shall be cleaned and inspected for damage. Damaged insulation shall be replaced in kind. The evaporator coil shall be removed cleaned inside and out and pressure tested in accordance with the manufacturers requirements and overhauled. All bent fins shall be straightened. All evaporator section piping shall be inspected for wear or damage and cleaned inside and out. Particular attention should be given to clamped and pass through areas during inspection.

The following devices and components shall be renewed:

1. All Shutoff Valves, Service Valves and Test Ports (Schrader Valve Caps shall have retaining chains)
2. Sight Glass Moisture Indicator and Glass Gasket

3. Thermal Expansion Valves
4. Low and High Pressure switches
5. Low and High Pressure Gauges
6. Refrigeration Control Panel Test Switch
7. Liquid Line Solenoid Valve and Coil
8. Filter/Dryer Core
9. Air Filters
10. Fresh Air Temperature Sensors

The evaporator blower assembly shall be removed cleaned and inspected. The blower motor shall be renewed. The blower assembly shall be balanced by adding weights to the fins of the blower wheels. The maximum head displacement shall not exceed 0.2 mils peak to peak. The flow switch shall be renewed. The contractor may propose and alternate method of detecting air flow to the Administration for consideration.

### 10.3.6 Overhead Heater

The overhead heater assembly located in the evaporator section of the HVAC unit shall be cleaned and inspected for damage and have the following components renewed:

1. Heating Elements
2. Over Temperature Limit Switches
3. Cracked, chipped or damaged Insulators
4. Damaged wire terminations

### 10.3.7 Temperature Sensors

The return air, fresh air, duct limit, layover and air distribution temperature sensors shall be renewed. Housing and support brackets shall be cleaned and inspected for damage. Damaged housings and support brackets shall be renewed.

The contractor shall renew all fans installed on the air distribution temperature sensor.

### 10.3.8 Ducts and Diffusers

All supply air, return air and fresh air ducts shall be inspected and cleaned. Damaged insulation shall be renewed. Return air grills shall be cleaned and inspected. Broken or defective latching (primary and secondary) hardware shall be renewed. Sealing gaskets that are worn, torn or have taken a permanent set shall be renewed. If the supply air diffusers are removed for cleaning the contractor shall record the cars number and location that the diffuser was removed from. If adjustable dampers are present on the diffuser they shall also record the damper setting. Supply air diffusers shall be reinstalled in their OEM positions with the OEM damper setting.

Supply air diversion dampers shall be cleaned and inspected. The damper diverter shall be checked for freedom of movement and overhauled if found defective. The damper motor shall be renewed.

### 10.3.9 Floor Heaters and Grills

Floor heater covers, grills, and protective plates shall be cleaned and replaced as needed. The floor heater strips shall be tested to the OEM requirements. The Contractor shall overhaul the heater; care must be taken to assure heat transfer fins are not damaged. Defective heater strips shall be renewed. All electrical connections are to be torqued to OEM specifications. All hardware and insulators shall be renewed.

Any heater element that is found to be defective or that cannot be overhauled shall be renewed. **For estimating purposes, it is anticipated 10% of heater elements will be replaced.**

The fan heaters located on the mid-level shall be cleaned and overhauled to OEM requirements. The fan motors shall be renewed.

### 10.3.10 Cab Heater

The cab heater shall be replaced.

### 10.3.11 Testing

In addition to the testing requirements in TS Section 14, the Contractor shall submit an On-vehicle Climate Control Validation Test plan for approval. **[CDRL 1003]**
In accordance with TS Section 14.3, the contractor shall submit for approval a design qualification test plan to validate that the microprocessor controller meets or exceeds the OEM interior climate control requirements and fault detection and logging requirements of this technical specification.

### 10.3.12 Spares

The Administration has four (4) spare HVAC units that shall be part of this scope of work. The Contractor shall be responsible for the overhaul of spare HVAC units in accordance with this specification.

Spare HVAC units shall be used as floats and installed on completed cars during the course of this project.

## 10.4 REQUIRED CDRLS

1001 The Contractor shall submit an HVAC Overhaul Plan to the Administration for approval.

1002 The Contractor shall provide a list of faults that will be detected and stored by the microprocessor controller to the Administration for approval.

1003 The Contractor shall submit an On-vehicle Climate Control Validation Test plan for approval.

# SECTION 12

# COMMUNICATIONS

## SECTION 12
## COMMUNICATIONS

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# SECTION 12
# COMMUNICATIONS

## 12.1 GENERAL SYSTEM DESCRIPTION

The existing communication system includes a PA amplifier, AAR base, speakers, control head panels, interior and exterior destination signs, a sign controller, radio, and Radio/PA/IC control head.

The MARC III passenger information signs are LED displays interconnected to the sign control unit over a RS485 network. The signs are from Daktronics, Inc.; 331 32nd Ave; Brookings, SD. Part numbers of the signs are as follows:

- 0Z-6639-01C - Interior LED Master
- 0Z-6639-01A - Interior LED Slave
- 0Z-6639-03C - Exterior LED Master
- 0Z-6639-03D - Exterior LED Slave

Cab Cars are equipped with a GPS and wireless modem ~~from ENSCO, Inc.; 5400 Port Royal Rd.; Springfield, VA; model RM-MU-4-R0DUAL. This system is available for the Contractor's use in aiding~~ **to aide** in the determination of vehicle location and to communicate data to and from the wayside. ~~The contractor shall include in their scope of work any expansion of the AVL necessary to meet the Overhaul requirements.~~

There are eight (8) passenger compartment speaker assemblies installed per car.

## 12.2 OVERHAUL REQUIREMENTS

Communication system components including PA amplifier, AAR base, sign controller and control head panels shall be replaced with new assemblies that meet the functional requirements of this section. The contractor shall submit a Communications Overall Overhaul Plan for Administration review and approval **[CDRL 1201]**. The plan shall include all software documentation requirements in TS Section 16.2.

An Automatic Announcement System Upgrade (AAS) is to be installed in order to provide additional capabilities to the MARC III cars. The upgraded AAS is to provide the following functionality:

1. Provide audio and textual messages to train passengers as described in this section
2. Permit transmitting ad hoc messages from any authorized AAS user to any selected vehicle(s).

3. Be fully compatible with MARC IV cars outfitted with the Axion Technologies communication system, which will be operated in a mixed fleet environment.
4. Be compatible with current MARC III destination signs.

The AAS and other supplied communication equipment must be designed and built to comply in all respects with all applicable laws, regulations, standards, and recommended practices of the following agencies and organizations:

A. US Department of Transportation (USDOT)
B. Federal Railroad Administration (FRA)
C. Federal Transit Administration (FTA)
D. US Public Health Food and Drug Administration (FDA)
E. America Public Transportation Association (APTA)
F. State of Maryland
G. District of Columbia
H. Association of American Railroads (AAR)

Where there is a conflict, the most restrictive shall apply. The equipment shall be suitable in all respects for use in the Administration's vehicles, and fixed installations related to their commuter rail system.

Although the required warranty is defined elsewhere in the Contract Documents, the design of the AAS and the level of quality and durability of the AAS components shall be consistent with minimum useful life of fifteen (15) years.

Unless otherwise stated, the requirements within the Specification apply both to vehicle and fixed equipment supplied under this Contract.

## 12.3 SCOPE OF WORK

A new communications system, complete with passenger emergency intercoms, automatic announcement system, and exterior speakers shall be provided that is compatible with the Axion MARC IV PEI and AAS. The system shall control the functions identified in this section.

The communications system shall permit the train crew to make announcements and to page the passengers and other train crew members by use of the speakers in the passenger areas of the cars. It shall permit two-way radio communication between the train crew/Operator and other trains and wayside installations. It shall permit private two-way intercommunication between any two (2) communication control panels within the train; e.g. between train crew and Operator. It shall also accommodate recorded or digitized human speech messages for announcements or other passenger information in accordance with the requirements of 49 CFR

38 and enable announcements to be interfaced with the interior destination sign for visual broadcasting. Passengers shall have the capability to communicate with the train crew members via the Passenger Emergency Intercom System. In addition, the system shall be capable of receiving and displaying on the interior signs arbitrary text messages addressed to the passengers and/or crew (paging system). Each cab car shall include cellular communications capabilities incorporated with the radio communications and capabilities to record all PA announcements. The communications system shall also provide for transfer of data between the train and wayside installations using a cellular modem and/or via wireless LAN.

All trainline communication shall be compatible with existing MARC cars. The PA/IC functions shall be included ~~**in the digital audio trainlines in the cabling for the digital train network (DTN), while the conventional baseband audio trainlines shall be included**~~ in the door and communications trainline ~~system~~. The cars shall utilize analog communication for intra-car communication. All **replaced** cabling **used for data/communication** shall be shielded twisted pairs capable of digital communication transmission.

The communication system shall utilize audio for trainline transmission of voice signals, along with conventional baseband audio trainlines for backward compatibility with older MARC rolling stock. The digital audio subsystem shall be compatible with MARC IV cars.

The PA, radio, and wayside to train communication equipment shall be provided with separate circuit breakers. Apparatus requiring power conversion devices, because of voltage range requirements, shall have those devices designed integral to the apparatus. Power conversion devices, external to the apparatus, shall not be acceptable.

Suppliers of the communication systems shall have proven experience in the successful design and manufacture of apparatus of this type for similar railcar application, and the Contractor shall follow the manufacturer's recommendations for its installation.

### 12.3.1 Radio

The radio shall be inspected and repaired or replaced as necessary per the OEM procedures.

### 12.3.2 Public Address and Intercom System

A. **PA Amplifier.** The PA amplifier and AAR base shall be replaced. The Amplifier shall be functionally equivalent to the equipment found in the MARC IV cars operated by the Administration, upgraded to perform based on the requirements of this section. The amplifier shall be mounted in the electric locker of all cars. The power amplifier shall have sufficient power to drive all speakers within the car, with 25% reserve power.

With normal speech input, the amplifier shall operate continuously, at full output, at

rated input voltage, without degradation. The compression amplifier shall produce a minimum compression range of 35 dB, with a maximum output level variation of 2 dB and a maximum total harmonic distortion of 3% at the compressor output. The compression amplifier shall operate satisfactorily with the speaker being 1″ to 12″ from the microphone.

The PA system shall include an internally switched selectable method of controlling the audio output level in each car, based upon the ambient noise level.

1. Each car shall be automatically controlled, independent of other cars, to provide a comfortable, intelligible sound level at all seating locations.

2. At no time shall an increase in audio levels result in audio feedback.

Each PA announcement made by a crew member shall be recorded and stored digitally in the cab car ~~and/or locomotive~~. The announcements shall be digitally recorded, vox controlled, and stored in non-volatile memory. The storage memory shall have sufficient capacity to store not less than eight (8) hours of PA announcements with a memory organized in a "first in first out" basis. The system shall permit the downloading of announcement information to PC and removable PC memory card (PCMCIA or USB), and via the wireless wayside to train link. The following shall be maintained for each PA announcement:

1. Announcement

2. Train Number

3. Time of Announcement

4. Train Consist including Road Numbers for All Cars

5. Car Number where Announcement was initiated

6. Location of train

Details of the design, arrangement, and installation of the PA system shall be included in the Communications Overall Overhaul Plan.

**B.** **Interior Speakers.** All speakers shall be inspected and tested and reused if good. A speaker inspection and test procedure shall be included in the Communications Overall Overhaul Plan. Speakers that do not pass the inspection and test shall be replaced. **It is estimated that approximately 25% of all speakers shall be replaced.**

C. **Exterior Speakers.** To comply with the requirements of 49 CFR 238.121, exterior speakers shall be installed in each side of the coach.

A minimum of two speakers shall be installed in each coach side. They shall be positioned at a height and longitudinal location that assures that a passenger standing on a station platform, anywhere along the length of a coach, is able to hear PA announcements. If necessary, to provide satisfactory performance, a third speaker shall be installed at the longitudinal center of each side of the coach.

The speakers shall be specifically designed for external use and the speaker enclosures shall be watertight. Each speaker shall be covered with a stainless steel grille that matches the coach surface finish and shall be secured by tamper-proof fasteners.

The audio level of the exterior speakers shall be adjustable separately from the interior speakers.

The design of the PA system shall allow selection of manual PA announcements over interior and/or exterior speakers at the conductor control head. The logic for speaker control shall be through the trainline communication network. Automated announcements shall be configurable to play on internal, external, or both via the AAS database.

D. **PA Control Head.** Control heads shall be replaced, and functionally equivalent to the control head currently used by the Administration, with expanded functionality to meet the functional requirements of this section. Control panels shall remain at the existing locations. The system shall be designed such that feedback or interference from nearby speakers to an active microphone shall be minimized. Functionality of the control heads shall be expanded to allow the manual selection of internal, external, or both speakers, and to allow communication and control of Passenger Emergency Intercom calls.

### 12.3.3 Passenger Emergency Intercom

The coaches shall include a new Passenger Emergency Intercom (PEI) system. The PEI system shall permit emergency communication between passengers, the Operator and the Train Crew between the PEI station panels and the intercom system. The PEI system shall comply with the requirements of 49 CFR 238.121. The PEI system shall function identically and be fully interoperable with the PEI system outfitted on the MARC IV railcars.

A PEI station, for passenger use, shall be located in each middle level and in each toilet room. The exact mounting location for each panel shall be included in the Communications Overall Overhaul Plan. Each station shall be equipped with the following:

1. A flush mounted microphone and intercom speaker behind a perforated vandal-proof grille.

2. A push to call push button. When the PEI panel's push button is depressed, the PEI lights on all the communication panels in the consist shall flash and the audible signal shall be activated. A distinctive tone shall be sounded in the cab when a signal is initiated from the PEI system.

3. An LED to indicate to the passenger that a call has been placed. The LED shall flash when the push button is pressed and shall change to steady illumination after the call is answered by a crew member.

4. Operating instructions shall be provided adjacent to the panel in photo luminescent material per APTA Standard SS-PS-001-98.

System design, layout, and functionality shall be included in the Communications Overall Overhaul Plan.

### 12.3.4 Automatic Announcement System (AAS)

The Contractor shall provide all necessary hardware and software to allow the AAS system to perform the functions listed below:

**A. <u>Route and Station Information.</u>** The Administration's MARC service current route and station information are provided in Tables 1 through 4, following. Distances are approximate and the Contractor shall be responsible for obtaining accurate distance data.

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 7.5 | (7.5) | Silver Spring |
| 03 | 11.0 | (3.5) | Kensington |
| 04 | 12.3 | (1.4) | Garrett Park |
| 05 | 16.7 | (4.3) | Rockville |
| 06 | 20.8 | (4.1) | Washington Grove |
| 07 | 21.6 | (0.8) | Gaithersburg |
| 08 | 23.6 | (2.0) | Metropolitan Grove |
| 09 | 26.4 | (2.8) | Germantown |
| 10 | 28.9 | (2.5) | Boyds |
| 11 | 33.4 | (4.5) | Barnesville |
| 12 | 35.5 | (2.1) | Dickerson |
| 13 | 42.8 | (7.3) | Point of Rocks |
| 14 | 49.8 | (7.0) | Brunswick |
| 15 | 55.7 | (5.9) | Harpers Ferry |
| 16 | 62.0 | (6.3) | Duffields |
| 17 | 74.0 | (12.0) | Martinsburg |

Table 1. BRUNSWICK LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station Washington |
| 02 | 9.0 | (9.0) | New Carrollton |
| 03 | 11.3 | (2.3) | Seabrook |
| 04 | 16.6 | (4.8) | Bowie State |
| 05 | 22.4 | (5.8) | Odenton |
| 06 | 29.7 | (7.3) | BWI Rail Station |
| 07 | 33.0 | (3.0) | Halethorpe |
| 08 | 37.5 | (4.5) | West Baltimore |
| 09 | 40.3 | (2.8) | Penn Station, Baltimore |
| 10 | 52.0 | (11.7) | Martin Airport |
| 11 | 60.9 | (8.9) | Edgewood |
| 12 | 70.5 | (9.6) | Aberdeen |
| 13 | 76.5 | (6.0) | Perryville |

Table 2. PENN LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 7.5 | (7.5) | Silver Spring |
| 03 | 11.0 | (3.5) | Kensington |
| 04 | 12.3 | (1.4) | Garrett Park |
| 05 | 16.7 | (4.3) | Rockville |
| 06 | 20.8 | (4.1) | Washington Grove |
| 07 | 21.6 | (0.8) | Gaithersburg |
| 08 | 23.6 | (2.0) | Metropolitan Grove |
| 09 | 26.4 | (2.8) | Germantown |
| 10 | 28.9 | (2.5) | Boyds |
| 11 | 33.4 | (4.5) | Barnesville |
| 12 | 35.5 | (2.1) | Dickerson |
| 13 | 42.8 | (7.3) | Point of Rocks |
| 14 | 53.7 | (11.9) | Monocacy |
| 15 | 56.1 | (2.4) | Frederick |

Table 3. FREDERICK LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 5.9 | (5.9) | Riverdate |
| 03 | 7.0 | (1.1) | College Park |
| 04 | 9.2 | (2.0) | Greenbelt |
| 05 | 13.3 | (4.1) | Muirkirk |
| 06 | 17.1 | (3.8) | Laurel |
| 07 | 17.6 | (0.5) | Laurel Racetrack |
| 08 | 20.3 | (2.7) | Savage |
| 09 | 22.6 | (2.3) | Jessup |
| 10 | 25.3 | (2.7) | Dorsey |
| 11 | 29.6 | (4.3) | St. Denis |
| 12 | 36.4 | (6.8) | Camden Station, Baltimore |

Table 4. CAMDEN LINE

**B. <u>On-board Route and Station Information.</u>** The AAS shall automatically visually and audibly announce train route and station information based on the train number entered by the train crew. The AAS shall automatically perform the following functions:

1. Display the train number and final destination on the exterior destination signs.
2. At an Administration programmable distance before a scheduled station stop, the interior destination signs in all cars of the consist shall display "The next station is…" and the station name. The system shall simultaneously broadcast the same message over the PA system on the entire consist.
3. Once the train has stopped at a scheduled station stop and the passenger doors are opened, the interior destination signs in all cars of the consist shall display "This station is…" and the station name. The system shall simultaneously broadcast the same message over the PA system on the entire consist.

4. At an Administration programmable distance after departing from a scheduled station stop, the interior destination signs in all cars of the consist shall display "The next station is…" and the station name; the same message shall be heard over the PA system on the entire consist.

5. The system shall be capable of making train connection announcements when applicable. When programmed to do so, it shall automatically audibly announce and display passenger connection information, such as "Change here for train to …", "The train to … is on track …", etc.

6. The AAS shall perform the above within an accuracy of 30 meters.

7. It shall be possible for the Administration to change any of the messages either on-board via a laptop computer, USB memory device, or via the wireless data link to the wayside.

8. The station stop sequencing associated with any given train number is subject to change several times per year as schedules are adjusted. There shall be an automated, centralized mechanism for updating this database on each vehicle. There shall not be a necessity to update each vehicle individually to accomplish this periodic updating. This centralized update shall apply to both the on-board audio as well as the displayed text information. Schedule updates shall be capable of having an affectivity date in order to allow for advanced transmission of the changes.

C. **Wayside to Train Communication.** The AAS shall allow bidirectional data transfer from the wayside to the train. The wayside portion of the AAS shall use the cab car numbers as the basis for identifying vehicles with which to communicate. The Administration will use the cab car number to identify the train number.

The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the wireless data connection or~~ supply and install a separated data modem and antenna.

The AAS shall allow the OCC to send textual paging messages to interior destination signs and/or audio messages over the vehicles PA system as follows:

- Selected trains, using train numbers of vehicle numbers;
- All vehicles based on geographic location (all vehicles within defined radius of a particular point or within a defined geographic area);
- The entire vehicle fleet.

These messages shall be either selected from a predetermined list of prerecorded messages or dynamically generated and transmitted from the OCC on an ad-hoc basis.

The wayside to train communication shall also allow the update of on-board software, databases, and other files including audio messages.

It shall be possible to interrogate the AAS to determine train location, system status, software revision, and other diagnostic functions via the wayside to train communication.

**D.** **Train Position.** The AAS shall determine the location of the head-end car in the consist with an accuracy of plus or minus 30 meters. When the consist is operating in a locomotive leading mode the train position shall be calculated to reflect the first passenger car after the locomotive.

Train position information shall be based on GPS location. When the GPS data is not available due to loss of the satellite signals or other reason the train position information shall be determined by inertial navigation or an independent speed sensor to be supplied and installed on each cab car as part of this contract.

The system shall maintain the last known vehicle location in memory to allow the system to quickly respond to a power loss or power-up when the GPS data is not available.

The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the GPS data or~~ supply and install a separated DGPS receiver and antenna. If the contractor opts to supply a separate DGPS receiver and antenna the contractor shall supply an analysis to show that the location of the antenna does not interfere with or is not affected by other existing antennas on the vehicle.

**E.** **System Response Time.** The AAS system shall respond to user command in the minimum time possible. The Contractor shall prepare an analysis for Administration approval for any command that cannot be executed within 50 ms.

There shall be a visual and or audio feedback to indicate to the user the status and completion of each command or function requested. The maximum time from power-up to system ready shall be 30 seconds. (Note: this time does not include the time required to acquire the GPS satellite data if the Contractor supplies a stand-alone GPS receiver).

In the event of loss of power to the AAS, the system shall retain its current position and route information. No user intervention shall be required to restart the AAS on reapplication of power.

**F.** **Security.** The wayside to train communication system shall be secured against unauthorized access or attack, both from the vehicle itself and from the wayside. Security requirements shall apply both when the vehicle is in revenue service and

when the vehicle is out of service for maintenance or storage. Security measures shall be consistent with industry best practices at the time of design.

To demonstrate compliance, the Contractor shall prepare and submit at the FDR, for approval by the Administration, a Wayside to Train Communication System Vulnerability Assessment identifying all potential system vulnerabilities; associated risk (including exploit likelihood and consequences); countermeasures applied; and resulting mitigated risk. **[CDRL 1202]** The report format shall be similar to that of a hazard analysis; a representative sample of the proposed report format shall be submitted for approval.

Exploits to be considered shall include, but are not necessarily limited to, the following, as appropriate:

1. Vandalism;
2. Eavesdropping;
3. Device/user impersonation;
4. Dictionary attacks;
5. Message modification;
6. Session hijacking;
7. Buffer overflow;
8. Denial of service;
9. Jamming (physical layer denial of service);
10. Virus/worm infection;
11. Unauthorized software installation; and
12. Unauthorized root/administrator access.

Security measures shall include, but are not necessarily limited to, the following, as appropriate:

1. Restricting physical access to communication and control system components to all but authorized personnel;
2. Use of access control lists (ACL);
3. Use of device and/or user authentication;
4. Use of encryption;
5. Use of hardware keys in conjunction with passwords/pass-phrases;
6. Access logs;

7. Intrusion detection/prevention;
8. Antivirus;
9. Proper isolation of security critical system functions from other functions;
10. Application of secure coding practices; and
11. Use of secure operating systems.

Security measures shall be designed and implemented such that their effect on reliability, availability, and basic system operation is minimized.

The Contractor shall make available any security updates to the Administration over the life of the Contract without charge. The Contractor shall notify and make available to the Administration any recommended security upgrades over the service life of the AAS.

**G. <u>OCC User Functions.</u>** The AAS shall allow an OCC user to perform the following functions in real time:

1. Modify on-board route and station sequence information;
2. Initiate and address wayside to train messages;
3. Display or generate a report on the diagnostics and error handling information for the AAS.
4. Display or generate a report on messages sent over the AAS

**H. <u>On-board User Functions.</u>** The AAS system shall allow the on-board (vehicle) user to perform the following functions:

1. Initiate pre-recorded paging system messages;
2. Enter the train number;
3. Pause or silence all on-board announcements;
4. Adjust on-board announcement volume (password protected);
5. Access system diagnostic tools (password protected);
6. Provision to permit the train crew to disable the AAS input to the PA in the event of a faulted AAS, while still maintaining the functionality of on-board, manual, PA messages;
7. Resynchronize the train location in the event of the loss of the GPS data.

## I. On-board Equipment:

1. Destination signs - The contractor shall utilize the existing Electronic Interior and Exterior Destination Signs. All signs shall be inspected and repaired or replaced as necessary per the OEM procedures.

2. Operator's Control Panel - The operators control panel shall allow the train crew to control the AAS functionality and allow the maintenance staff password access to diagnostic control functions.

   The control panel shall be equipped with a keypad and a 25 character two row alpha numeric display, at a minimum. The display and keypad shall be vandal proof.

   The display shall be capable of being read under all lighting conditions. The keypad and display may be combined into one touch screen display if approved by the Administration.

   The operator control panel shall be equipped with a connector for the connection of a portable memory transfer unit. The connector and memory transfer unit shall be approved by the Administration during the design reviews.

   The MARC III operator's control panel shall be installed in the same location as the existing operator control panel.

   The keypad shall be placed at a suitable height for easy operation.

   The operators control panel shall allow the train crew in control the AAS functionality and allow access to diagnostic control functions from any vehicle in a train consist. The control of message display throughout the train shall be accomplished over the data network.

   The Control panel shall allow the train crew to perform the following functions from any point in the consist:

   1. To enter the train number which will be used to select the current train route and station announcements. The current train number shall be stored in non-volatile memory so that in the event of a power interruption the system will automatically continue to function when the power is restored.

   2. To program all side signs, and interior signs with different messages from any operator's display keypad.

   3. To initiate any prerecorded audio message to be played throughout the train consist.

4. To resynchronize the location of the train in the event that the system does not have the correct train location.

5. Modify on-board route and station sequence information

6. Adjust on-board announcement volume (password protected)

7. Access system diagnostic tools (password protected)

8. To permit the train crew to disable the sign messaging via the operators control panel in the event of a system fault. The sign may default to either a fixed message or a blank.

The Control panel shall be capable of displaying the following information:

1. Train Number

2. Next Station Name

3. General health information (GPS available, time and date, etc.)

The design and operation of the operator's control panel shall be included in the Communications Overall Overhaul Plan.

**J. GPS Receiver and Antenna.** The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the GPS data or~~ supply and install a separated DGPS receiver and antenna. Should the Contractor provide a separate DGPS receiver and antenna, the following requirements apply.

The Contractor shall provide a Differential Global Positioning System (DGPS) receiver and antenna. The DGPS receiver shall be Wide Area Augmentation System (WAAS) and differential beacon-capable. The system shall utilize the GPS mode with the lowest Dilution of Precision available at each moment in time.

The GPS receiver may be installed as part of sign control unit, or operators control panel. The antenna shall be a combined GPS and data modem antenna with a low profile that shall not exceed the clearance envelope of each type of vehicle in the fleet.

The GPS data shall be used to trigger the automatic station announcements.

**K. Wireless Modem and Antenna.** The data modem shall be CDMA/1xEV-DO of a type approved by the Administration and supported by at a minimum two wireless data service providers in the area that the Administration will operate the trains.

The Wireless modem may be installed as part of sign control unit, or operators control panel.

The antenna shall be a combined GPS and data modem antenna with a low profile that shall not exceed the clearance envelope of each type of vehicle in the fleet.

The wireless modem shall be used for all train to wayside communications. The wireless modem design and installation should be such to allow updates to alternative modems without requiring software upgrades of any on-board systems.

**L.** **Speed Sensors.** The Contractor shall supply and install an active speed sensor and cabling as required.

The speed sensor shall be designed and produced to comply with Section 6 of EN 50155.

The sensor shall utilize a threaded installation to the supporting apparatus. The thread shall be 0.625-18 UNF-2A. A hex-shaped jam nut, 1/4-in. high, shall be furnished with the speed sensor to lock it in place. Wrench flats shall be provided on the sensor body to allow holding the sensor body while the jam nut is tightened. The Supplier shall specify torque limit for the wrench applied to the sensor body.

The speed sensor shall withstand ± 100 g acceleration in any axis without damage or loss of service life.

The speed sensor shall be designed for a fatigue life of 107 cycles under loads produced by ± 50 g acceleration in any axis.

The sensor design shall accommodate a reasonable run-out in the gear wheel used for sensor excitation and shall allow, to the extent practicable, some lateral offset of the tooth and the sensor pole face. The Contractor shall specify the requirements for the air gap between the pole face and exciter tooth, subject to the Administration's approval. The intent is for the sensor to operate at gaps up to 0.10 in. (2.5 mm). The pole wheel exciter for the sensor will have a diametral pitch, DP = [(no. of teeth + 2)/(outside diameter of wheel in inches)] 11-1/4. The sensor must operate successfully with an air gap between 0.025 and 0.050 in.

The sensor case shall be constructed of 303-grade stainless steel. The sensor shall be environmentally sealed. Combined with the electrical connector, the sensor shall meet or exceed the protection code of IP66 (IEC) or type 4X (NEMA). The pole face end of the sensor shall be sealed and the sensor assembly shall not be affected by repeated thermal cycling between the specified temperature limits.

The electrical connections shall be by a multi-pin connector conforming to MIL-C-5015 or Buyer approved equal. Electrical contacts shall be 30 mil gold plate over 50 mil low stress nickel. Wire connections to the connector shall be soldered and potted. There shall be no electrical connection of the two shields within the sensor or the connector. It is acceptable to have two galvanically isolated channels, with the

power supply inputs connected external to the sensor, within the interface connector.

The sensor shall be designed to meet the environmental requirements specified in IEEE Std 1478, for condition E1.

The sensor shall operate in any ambient temperature between –40C to 120C without any adverse affect on service life.

The speed and distance calculations shall be based on nominal 34.5 inch wheel diameter with a 100 tooth gear. Actual wheel diameter is 36 in. new and 33 in. worn; the maximum car speed is 125 mph.

The speed sensor shall be mounted on the trailing axle (axle number 2) of the F end truck in the existing mounting hole unless approved by the Administration.

The speed sensors shall be used to determine train location when the GPS data is not available. The speed sensor output will provide vehicle speed and direction. At the contractor's option, inertial navigation can be used as an alternative to or in addition to the installation of the speed sensor.

**M. <u>Networks.</u>** The contractor shall provide the following data networks to allow the AAS to transfer data from one vehicle to another within the consist and to each destination sign.

The MARC III trains are equipped with two networks. The train network, which communicates between the cars in a consist, is a Lonworks powerline network based on the PLT10a transceiver which is now obsolete. The sign network is based on the RS-485 protocol.

The contractor shall propose a new train network to provide compatibility with the MARC IV cars, which may be used in a mixed consist environment. In these instances, it should not be necessary to program multiple sign controllers for proper operation of the destination signs.

The contractor may utilize the existing RS-485 sign network or propose an alternative network design.

All networks shall be design to have adequate capacity. The contractor shall provide a network traffic analysis to show that no more than 25% of the networks capacity is unitized at any time.

All networks shall have a maximum of 200 ms inauguration or re-inauguration time and shall automatically re-inaugurate if one node is non-responsive. The network

shall automatically re-inaugurate when there is any change in the number of nodes on the network (e.g., a car is added or removed from the consist).

All networks must be an open network non-proprietary design to allow the Administration to, at a later date, to purchase equipment that will be compatible with these networks and data structures. The networks chosen shall be designed to be immune for electromagnetic interference and transients.

The Contractor shall provide a non-proprietary open Interface Control Document (ICD) describing all aspects of the networks. The Contractor shall provide a detailed verification and validation test procedure to prove the ICD is complete. **[CDRL 1203]**

The system shall be operated from any operator's display keypad located in a cab car.

It shall be possible for only one (1) operator's display keypad unit on the train to be in use at any given time to select messages. It shall be possible to program all side signs, interior signs, and front signs with programmed messages from any operator's display keypad. The design of the destination sign system, including location and operation, shall be included in the Communications Overall Overhaul Plan.

Provision shall be included in the AAS to permit the train crew to disable the sign messaging in the event of a system fault. The sign may default to either a fixed message or a blank.

**N.** **Memory Transfer Unit.** A standard MS Windows compatible PC shall be used to update the message listing and all memory devices in the sign control units in each vehicle through the use of a PCMCIA card or USB memory device. It shall also be possible to update the system through the wireless link.

Software programs shall be provided, which shall enable authorized MARC personnel to change the message and voice databases using a standard PC.

The message listing created in the computer shall be transferred directly to each sign control unit via a PCMCIA card, USB memory device, or wireless link.

The resulting modified database in that vehicle shall remain in force until locally updated further or upon the implementation of the next fleet wide update, at which time, the locally unique database will be overwritten by the latest fleet wide update.

**O.** **Audio Announcements.** The AAS shall be designed and interface to each vehicle type's existing PA system in such a way that it meets the following requirements:

A. Shall not interfere with any of the existing functionality.

B. Audio volume of the announcements will be constant throughout the consist regardless of the consist's length of makeup.

C. Has the following performance characteristics:

1. Frequency Response: ±3 dB minimum from 80 Hz to 8,000 Hz
2. Total Harmonic Distortion (THD): less than 1% over entire frequency range
3. Signal to Noise Ratio > 100: 1
4. There shall be no pop or click sound when a message is started or ended.

D. Messages will be given the following priority:

1. Manual crew initiated messages.
2. Wayside initiated messages.
3. Station and route messages.

## 12.4 REQUIRED CDRLS

1201 Contractor shall submit the Communications Overall Overhaul Plan to the Administration.

1202 Wayside to Train Communication System Vulnerability Assessment

1203 A complete set of all interface control documents and detailed verification and validation procedures for the Communication System.

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# QUALITY ASSURANCE

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# SECTION 16
# QUALITY ASSURANCE

## 16.1 GENERAL SYSTEM DESCRIPTION

The Contractor's Quality System efforts shall be in compliance with the requirements of ~~ANSI/ASQ Q9001-1994~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision**. Where it differs from the terms of the Contract, the more stringent requirement shall take precedent. The Contractor need not be certified under ~~ANSI/ASQ Q9001-1994~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision**.

The Contractor shall establish, implement and execute a comprehensive system to assure that all aspects of the work are in conformance with the Administration's contract. The Quality System shall include the Contractor's Quality System Manual, Quality Plan, and all implementing manuals, processes, and procedures. The Quality System Manual shall state the Quality Policy, definition of responsibilities, and authority of personnel who manage and perform work affecting quality. It shall include all procedures for implementing the required ~~**ANSI/ASQ Q9001-1994**~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision** standard.

The Administration reserves the right to perform required and/or continuous quality inspections at the Administration's discretion during the Contractor's execution of the Contract to ensure that the Contractor is meeting all of its Quality System requirements. The inspections will be performed independent of and in addition to the Contractor's quality assurance (QA) functions. These monitoring functions will confirm that Deliverables and Submittals under the Contract conform to the Specification as well as Administration-approved Contractor drawings and documentation. The Administration's quality control activities will in no way waive, abrogate, replace, negate, override, or lessen the Contractor's quality and other obligations under the Contract.

The Contractor's Quality System shall be subject to Administration verification at any time. Administration Inspectors shall have free access to the Contractor's/Subcontractor's facilities during all normal business hours and when work is in progress.

The Quality System shall be consistent with documents, including sample Quality System Manuals and Quality Plans, submitted by the Contractor and approved by the Administration

## 16.2 SOFTWARE QUALITY ASSURANCE

The requirements of this section shall apply to those new subsystems that utilize proprietary computer software to control their function. The Contractor shall submit, for approval, a Software Quality Assurance Plan in accordance with IEEE/ANSI Standard 730. ***(CDRL 1601)*** The plan shall include the submittal and approval of the documents listed below:

A. System Functional Description
B. Software Requirements Specification
C. Software Design Description
D. Software Verification and Validation Plan

E. Software Verification and Validation Report
F. User Documentation

The Software Design Description (SDD) shall be in accordance with ANSI/IEEE Standard 1016. The final Software Design Description shall include details required by ATA Specification No. 102, through all levels to level 6. Level 4 shall be interpreted to mean all source code, including operating systems. The levels defined in ATA No. 102 are summarized below only for information:

Level 1: Computer description and operation
Level 2: Software architecture, basic program and functions
Level 3: Detailed flow information
Level 4: Annotated compiler/assembly listing
Level 5: Detailed memory map and listing
Level 6: User documentation

After original approval, changes to the software shall be formally submitted for approval by the Administration, prior to implementation. The software documentation shall be revised concurrently with software changes.

## 16.3 QUALITY SYSTEM MANUAL

The Contractor shall establish and maintain a written Quality System Manual and procedures defining its Quality System. The procedures shall include, but not be limited to, the control of subcontractors, receiving inspection, discrepancy control, design control, production and process control, configuration control, software configuration control, functional test, drawing control, calibration/certification program, shipping inspection, QA/QC records, Contractor activity at the acceptance site or on the Administration's property, and any other quality provisions needed to meet the requirements of the Contract.

## 16.4 QUALITY PLAN

### 16.4.1 Submittal

Within 15 calendar days after Notice to Proceed, the Contractor shall develop and submit to the Administration for approval, a Quality Plan that defines the system elements required to regulate methods, procedures, and processes to ensure compliance with all Contract requirements. ***(CDRL 1602)*** If deficiencies are found during the assessment of the Quality Plan, corrective action shall be implemented and documented by the Contractor as a condition of having the Plan approved.

### 16.4.2 General Requirements

The Quality Plan shall illustrate how the Contractor intends to meet the Quality System requirements of the Specification and shall include as a minimum:

A. An organizational chart, including definition of the responsibilities of the Contractor's key management, project and line personnel. Also to be included are organizational charts for major subsystem suppliers.

B. Flow charts of paperwork for documenting the acceptance or rejection of material and the disposition of unacceptable material, for defining accountability for material found defective or malfunctioning during production conformance testing, and for configuration verification for items to be included in the Vehicle Overhaul History Books.

C. A Material Review Board (MRB) or approved equivalent.

D. The methods and procedures used to control daily manufacturing processes and material quality.

E. Forms used to convey, track, and account for design changes implemented in the vehicles regardless of their state of completion, and any other forms necessary for the Quality Plan. Each form shall be provided with a serial number.

F. Flow charts that show paperwork flow which documents the approval of new or upgraded component design.

G. The Plan shall include a manufacturing schedule indicating the Contractor's plant location, and the work to be performed for its own operations and those of major subcontractors. When work is scheduled to be accomplished at different locations, the Contractor's manufacturing schedule shall clearly identify each location and the work to be accomplished therein. All work shall follow the Contractor's manufacturing schedule and shall not be moved from one plant to another without the Administration's written approval. All systems completed at a given site shall be demonstrated to be functionally operational before shipment to another site.

### 16.4.3 Audits

The Administration-approved Quality Plan and all implementing manuals, processes, and procedures will be subject to periodic audits by the Administration. The Administration reserves the right to visit the Contractor's facility, prior to approval of the Plan, to perform an audit of the effectiveness of the submitted Quality Plan.

### 16.4.4 Inspection and Test Schedule

The Inspection and Test Schedule shall show major manufacturing, inspection, and test milestones on a schedule that includes planned dates for submittals. The Inspection and Test Schedule shall identify all inspection or test witness and hold-points in accordance with TS Section 16.5. The Inspection and Test Schedule will be used by the Administration to ensure the Contractor's commitment to product quality and compliance with all Contract requirements. The Inspection and Test Schedule shall include a rectifying feedback system to the Contractor's engineering and production groups. The Quality Plan shall include a schedule/matrix of testing and inspection keyed to the Special Provisions and Technical Specification of the Contract and covering each item of the work in accordance with the Specification requirements.

## 16.5 QUALITY PLAN – DETAILED REQUIREMENTS

### 16.5.1 Management Responsibility

The Quality System organization structure of the Contractor, Subcontractors, and Suppliers shall be clearly defined and independent from the manufacturing unit. The management responsibility for the QA function shall be set forth in the Contractor's policy and organization chart. The QA manager shall have sufficient authority and organizational freedom to insure that a non-conforming or discrepant product will not be delivered to the Administration. The Contractor shall ensure that the Quality System is understood, implemented, and maintained at all levels of the organization. The responsibility for the QA function shall be so placed within the Contractor's own organization such that the quality of products delivered under the terms of this Contract shall not be compromised in order to meet schedule and cost projections. Any conflicts that arise as a result of this provision shall be brought to the Administration's attention by the Contractor's QA Manager and shall be resolved to the Administration's satisfaction prior to shipment of affected items.

The Contractor's executive management shall review the Quality System at defined intervals using the ASQ/ISO 9000 series Standards and the Contractor's stated quality policy and objectives to ensure the continued suitability and effectiveness of the Quality System.

### 16.5.2 Contract Review and Change Control

The Contractor shall establish procedures to review and amend the Contract via a change control system.

### 16.5.3 Design Control

Written procedures shall be implemented by the Contractor for control of the entire design process including design validation and changes. These procedures shall ensure that Specification design requirements are correctly translated into drawings and specifications used for procurement, manufacture, and test. The Contractor shall implement procedures for transmission of design and quality requirements and standards to subcontractors and suppliers to assure compliance with Contract requirements.

The Contractor shall establish and maintain objective evidence of compliance with all of the requirements of the procurement specifications and design control procedures.

The Contractor shall provide procedures for the evaluation of proposed changes to design drawings and Specifications, ensuring that there is complete compliance with Contract requirements for proposal, approval, and implementation of engineering changes. The Contractor shall be responsible for all drawings and engineering changes presented by subcontractors and suppliers.

The Contractor shall implement a Configuration Management Plan that maintains and assures the latest drawing configuration. The Contractor shall ensure that requirements for the effectivity point of changes are met and that obsolete contract drawings and requirements are promptly removed from the system. Means of tracking the effectivity points for design change,

retrofits, upgrades and field modifications shall be employed and made available to the Administration to verify latest vehicle configuration.

### 16.5.4 Document and Data Control

The Contractor shall establish and maintain procedures to control all documents and data related to this Contract. The Contractor shall also be responsible for all documents and data generated by suppliers and subcontractors related to the Contract. There shall be procedures by which the documents and data will be reviewed and approved. A document control list shall be maintained providing current status of design documents and drawings. All revisions or changes to documents and data shall be reviewed and approved by the same individual or group that performed the original review.

### 16.5.5 Purchasing

The Contractor shall outline the methods to be used for selection and control of subcontractors and suppliers. The Contractor shall be responsible for ensuring that all supplies and services procured conform to Contract requirements. The effectiveness and integrity of quality control by the subcontractors shall be reviewed and assessed by the Contractor at intervals consistent with the product complexity and quality.

The Administration reserves the right to inspect, at the source, any supplies furnished or services rendered under the Contract. The Contractor shall support and facilitate the Administration's efforts to contact manufacturers, subcontractors, or suppliers for the purpose of discussing, among other things, schedule, design, or quality issues. When the Administration elects to inspect at a subcontractor's facility, such inspection shall not be used by the Contractor as evidence of effective quality control of the subcontractor.

It is the Contractor's responsibility to ensure that the subcontractor's product meets all the requirements of this Specification. The Contractor shall ensure that the subcontractors and suppliers are cognizant of all pertinent Specification requirements. Purchase order requirements shall ensure that the subcontractor must notify and obtain approval for design changes from the Contractor and for requests for certificates of compliance (where applicable) prior to implementation.

### 16.5.6 Control of Administration-Supplied Product

The Contractor shall establish and maintain documented procedures for the control of verification, storage, and maintenance of Administration-supplied product, if any.

The Contractor shall also establish procedures to ensure that Administration-supplied material and equipment is handled, secured, and incorporated into the vehicle in accordance with the terms of the Contract. These procedures shall include receipt inspection; and retention of material certifications.

The Contractor shall document accountability for receipt, consumption or return of parts supplied by the Administration.

### 16.5.7 Product Identification and Traceability

The Contractor shall establish and maintain procedures for identification and control of product. Product shall include batch, materials, subassemblies, and components. The procedures shall be used to prevent the use of incorrect or defective items, ensure that only correct and acceptable items are used or installed, and that current configuration is maintained. Manufacturing history of items shall be documented on paper forms or in on-line electronic files, such that the manufacturing status of parts and assemblies can readily be determined as they are processed. Any document or data files which trace items throughout receipt, storage, fabrication, repair, and shipment shall be retained and shall be subject to inspection by the Administration.

### 16.5.8 Process Control

The Contractor, subcontractors, and suppliers shall provide control of manufacturing and production processes that directly affect quality and product configuration through the use of a formal manufacturing schedule. This schedule shall be compatible with the approved inspection schedule and will show each significant operation and the related control/hold points for inspections, examinations and tests.

Hold-points shall be established by manufacturing such that in no case will work be hidden from inspection or test by subsequent assembly. All corrections shall require re-inspection and appropriate testing prior to advancement of work.

Manufacturing and production processes shall be performed and controlled using qualified personnel and procedures in accordance with industry codes and standards and Specification requirements. These processes shall include, but are not limited to, welding, heat treating, and non-destructive testing.

Manufacturing and production conditions that adversely affect product quality shall be identified, and eliminated. Evidence of corrective actions to prevent recurrence of such conditions shall be verified and documented.

The manufacturing schedule shall also identify activities that control or verify the qualification of personnel during all stages of design, procurement, manufacturing, fabrication, and testing.

### 16.5.9 Inspection

The Contractor shall establish formal inspection procedures. Inspection procedures shall be submitted to the Administration for approval prior to implementation. All inspections shall be performed to demonstrate compliance with Specification requirements, identify deficiencies and confirm the elimination of deficiencies.

The procedures shall provide detailed instructions for the performance of inspections, documentation of results, acceptance criteria and disposition and treatment of non-conforming items. Instructions for publication and retention of the results and final report shall also be defined.

If the Contractor employs the services of outside inspection facilities, it shall assure that outside services contractors demonstrate compliance to the appropriate industry standards and the Specification requirements. Outside services contractors' certification of compliance with industry standards and Specification requirements shall be submitted to the Administration for approval, prior to acceptance of services performed.

### 16.5.10 Inspection, Measuring, and Test Equipment

The Contractor shall ensure that inspection, measuring, and test equipment is identified, controlled, calibrated, and maintained in order to demonstrate the conformance of work to Specification requirements.

The Contractor, subcontractors, and suppliers shall demonstrate an effective time- or usage-cycled calibration/certification program. Validity of measurements shall be ensured through the use of suitable inspection, measurement, and test equipment of the range and type necessary to determine conformance of items with Contract requirements. Tooling and fixtures used as a medium of inspection or manufacture shall be included in this program. At intervals established to ensure continued validity, measuring devices shall be verified or calibrated against certified standards traceable to the National Institute of Standards and Technology or approved equivalent. Every device verified shall bear an indication showing current status and date for re-calibration. All calibration certifications shall be recorded and become part of the QA/QC records. In no case shall the Contractor use test or measuring equipment that bears an expired calibration stamp.

### 16.5.11 Inspection and Test Status

The Contractor shall provide the means to identify the inspection and test status of work during production and installation. The system shall be capable of identifying the progressive inspection status of components or materials as to their acceptance, rejection, or non-inspection status. This system shall ensure that only work that has passed the required inspections and tests is accepted. Non-conforming items shall be identified by physical segregation and status indicators such as markings, serialization, tags, stamps, and inspection records.

### 16.5.12 Non-Conforming Material

The Contractor shall establish and maintain an effective system for controlling non-conforming material, including procedures for its identification, segregation and disposition. Dispositions to use "as-is" or repair of non-conforming material shall require the Administration's approval. All non-conforming material shall be positively identified to prevent unauthorized use, shipment, or intermingling with conforming material. Holding areas and procedures, mutually agreeable to the Contractor and the Administration, shall be established by the Contractor.

Product that does not conform to the specified requirements shall not be incorporated into the work without the express written approval of the Administration. Each such request for approval must be submitted in a formal proposal signed by the Contractor's program manager, project engineer, and quality representative.

The Contractor shall establish a Material Review Board (MRB), or equivalent review procedures, for non-conforming material that will identify the causes of defects, disposition of defective material, and recommend corrective actions to prevent recurrence, including verification of the effectivity of the corrective actions. The MRB shall include one Administration representative. The procedures shall identify all Contractor representatives and/or departments responsible for this review. The MRB shall have sufficient authority to make disposition of non-conforming product without interference or reprisal from its own management. A summary report on non-conforming material shall be issued on a monthly basis.

### 16.5.13 Correction and Preventive Action

The Contractor shall establish and maintain procedures for implementing corrective and preventive action. The Contractor shall implement and record any changes to the documented procedures resulting from corrective and preventive action.

Corrective action and related information shall be documented and made available to the Administration upon request. Corrective action shall extend to all subcontractors and suppliers and include, at a minimum:

A. Analysis of data and examination of discrepant products to determine extent and causes

B. Introduction of required improvements and corrections, initial review of the adequacy of such measures, and monitoring of the effectiveness of corrective action taken

C. Analysis of trends in processes or performance of work to prevent non-conforming products.

### 16.5.14 Handling, Storage, Packaging, Preservation, and Delivery

Written procedures shall be established to assure that items are handled, stored, and shipped in such a manner to prevent damage and loss. There shall be instructions for identification markings, precautionary signs, protection against weathering and corrosion, drying agents, moisture barriers, electro-static discharge, and control of shelf life.

### 16.5.15 Records

The Contractor shall establish procedures to maintain and control records required to furnish evidence of activities affecting quality. These procedures shall include a QA/QC records list that will define which records will be kept. The procedures will also identify responsibility for production, collection, indexing, filing, storage, maintenance, and disposition of quality records.

Adequate records shall be kept to provide evidence of quality and accountability. These records shall include results of examinations, inspections, tests, process controls, certification of processes and personnel, non-conformance (including disposition), calibrations, corrective action, audits and any other quality requirements defined in the Contract. The records shall be complete and available for review by the Administration as provided under the Contract.

Exceptions taken to the quality of workmanship on the vehicle, inclusive of all subsystems, components, and materials by both the Contractor's and Administration's inspection representatives shall be posted in a manner convenient to review at or on the affected vehicle. The rejection/approval status of each exception shall be readily determined throughout the vehicle's manufacturing cycle and shall be kept current by the Contractor's inspection force on a routine, daily basis. This exceptions document shall be included in the QA/QC record list.

The Contractor shall retain copies of all records and make them available to the Administration for a period of a minimum of seven (7) years after expiration of all warranty periods, unless otherwise specified.

### 16.5.16 Quality Audits

The Contractor shall submit a comprehensive system of planned and periodic audits. The audits shall be carried out by the Contractor to verify compliance with and effectiveness of all aspects of the Quality System. The audits shall be performed at predetermined periods by qualified personnel not having direct responsibilities in the areas audited. The documented audit results shall be reviewed by the Contractor's management personnel having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be as determined by the Contractor and reported to the Administration. Audit reports and follow-up action reports shall be available to the Administration for review and approval no later than 10 calendar days after each audit.

Audits of subcontractors and suppliers shall be made by the Contractor and may be witnessed by the Administration at the following times during the execution of the Contract work:

A. As a condition of the subcontract or purchase order, prior to the start of any work.

B. Within a 30 calendar-day period prior to formal acceptance by the Contractor of the first article inspection or services being supplied by the subcontractor or supplier.

C. When the supplier or supplier facility manufacturing the product has changed.

D. When re-certification is warranted due to unacceptable performance, such as product non-conformance, schedule impact, or cost overruns are encountered.

Non-conformance with any part of the approved Quality Plan will be cause for rejection of the Contract work. Any schedule delays caused by non-conformance with the approved Quality Plan, whether by the Contractor, its manufacturers, subcontractors or suppliers, will not serve as a basis for an extension of time under the Contract.

The Administration reserves the right to conduct independent audits of the Contractor's Quality System for its effectiveness at any time. This audit shall include the Contractor, subcontractors, and suppliers. The Contractor shall take prompt action to resolve problems and obtain approval by the Administration. At a minimum, QA audits of the Contractor will be made at the following times during the course of the Contract at the Administration's option:

A. Prior to the start of production of the first vehicle.

B. Within a 30 calendar day period prior to formal acceptance of the first vehicle.

C. When the supplier or supplier facility manufacturing the product has changed.

D. When re-certification is warranted due to unacceptable performance, such as product non-conformance, schedule impact, or cost overruns are encountered.

All QA audits shall judge and report on the degree of compliance with approved procedures prepared by the Contractor. Audit reports shall be prepared and submitted within 10 days following any audits conducted by the Administration. The audit report will describe the scope of the audit; the procedures used; a statement of all deficiencies found, keyed to the approved Quality Plan; the corrective action required for each deficiency found; and the date by which corrective action will be completed. The Contractor shall prepare a report in a similar manner for each audit conducted by it and shall submit a copy to the Administration and to the audited organization.

Each audit shall require a formal written response by the Contractor within 10 days of receipt of the initiating Administration audit report. Responses shall fully describe the methods and timetable by which compliance will be achieved and demonstrated. Contractor audit responses will be subject to the Administration approval.

### 16.5.17 Personnel Qualifications and Certifications

Contractor personnel performing inspections and tests shall be qualified for such work by virtue of prior experience and training, and verified by testing where applicable. Manufacturing personnel performing processes such as welding and brazing shall be currently certified for such work. Manufacturing personnel performing all other work shall be experienced for the task being performed. Records of personnel certification and qualifications shall be maintained and available for the Administration's review.

### 16.5.18 Statistical Techniques

The Contractor shall identify the need for statistical techniques that will be used for the Contract requirements. Sampling plans used by the Contractor shall be fully documented and based on generally recognized and accepted practices. Statistical quality control applications used in acceptance of parts, materials, and/or processes by the Contractor shall be submitted to the Administration for approval.

The Contractor may use certificates of compliance, with a certified copy of test results, for materials and products in lieu of specified sampling and testing procedures, as approved by the Administration. All evidence of compliance shall be preserved and shall be available to the Administration upon request. All certificates of compliance shall identify, at a minimum, the part number, serial number, and batch or heat number. The certificate shall be signed by an

authorized representative of the Contractor or subcontractor, stating that the equipment or material complies in all respects with Contract requirements and industry standards.

## 16.6 QUALITY SYSTEM PROCEDURES

The Contractor shall develop procedures to assure effective implementation of the QA/QC activities for this Contract. At a minimum, the following procedures shall be included in the Contractor's Quality System Manual for use in the Quality Plan:

A. Design control, including control of all technical documentation

B. Transmission of all QA/QC requirements to procurement sources

C. Surveillance of subcontractors and suppliers for conformance with all Specification requirements

D. Receiving inspection, in-process inspection, and final inspection

E. Production and process control

F. Operator certifications and qualifications

G. Functional testing

H. Discrepancy control

I. Discrepant Material Disposition

J. Corrective action

K. Measuring and test equipment calibration and certification

L. Drawing control

M. QA/QC records and record retention

N. Shipping inspection

O. Selection of qualified procurement sources

P. Evaluation and assessment of subcontractor's Quality System

Q. Monitoring of subcontractor QA/QC performance

R. Evaluation of procured articles against purchase order requirements

S. Feedback of problems and their resolutions to the Contractor's engineering and production departments

T. Material Equipment Certification and Test Reports

U. Mill and laboratory testing and reporting.

## 16.7 INSPECTION REQUIREMENTS

During vehicle overhaul, the Contractor shall provide inspection points at all critical stages manufacturing operations, and test to monitor production progress and adherence to Contract requirements. There shall be sufficient inspection points to ensure that non-conforming material or product does not enter or remain in the production process.

The Contractor shall inspect and physically or functionally test all items to be delivered under the terms of this Contract. Inspection shall occur at appropriate points in the manufacturing sequence to ensure compliance with drawings, process and test specifications, quality procedures and standards. Non-conformance shall be documented and corrected according to TS Section 16.5.12. Discrepant material review results and recommendations shall be documented and corrective action taken according to TS Section 16.5.13.

The Contractor shall ensure that inspections are performed on the latest approved design. When modifications, overhauls, or replacements are required, there shall be a reinspection of the affected items. All inspection procedures shall provide for reporting deficiencies or questionable conditions to the Administration.

Typical inspection points are identified in the sections that follow. The Administration's participation in or witness to any or all of these inspections shall be at the Administration's discretion and shall in no way alleviate the Contractor's responsibilities for such inspections.

### 16.7.1 First Article Inspections

First Article Inspections (FAI) shall be required for selected overhauled equipment, and all new and upgraded systems, assemblies, and subassemblies, which are furnished by the Contractor and subcontractors.

At a minimum, the following shall be subject to a formal FAI:

A. Trucks
B. Wheel/Axle assembly
C. Battery Charger

Within 30 days after NTP, the Contractor shall provide to the Administration a list of items subject to FAI ***(CDRL 1603)*** and based on the approved overhaul schedule. The list shall provide notification of no less than 15 days in the U.S. and 30 days outside the U.S. for any scheduled event. The list shall be updated and issued monthly.

The Contractor shall conduct the FAI at the point of manufacture on the first piece, component, assembly, or system constructed using production tooling and conditionally approved or approved design drawings. A procedure shall be submitted by the Contractor and approved by the Administration prior to conducting the FAI.

The FAI shall establish the quality of workmanship for the balance of like components and evaluate component and system maintainability where possible. Photographs shall be taken to document the results of the FAI. Three sets of photographs shall be forwarded to the Administration, with a minimum of one set to be retained by the Contractor. Any subjective characteristics noted during the FAI shall be evaluated and criteria for inspection shall be agreed to, jointly, by the Administration and the Contractor. Whenever possible, the Contractor will retain at least two sets of samples to inspect subjective characteristics, such as color, finish, or texture. The approval status of samples shall be clearly visible and easily authenticated. Samples are to be retained in a secure place. At a minimum, the following shall be required to perform an FAI:

A. A complete set of drawings approved or conditionally approved by the Administration.

B. Material certifications.

C. Vendor certifications, as required.

D. Inspection forms that control in-process work.

E. Proof that all required testing has been performed in accordance with the Approved Inspection and Test Plan and the results satisfy specification requirements.

F. A Contractor pre-FAI final inspection report to assure readiness of the first article.

G. Tools and labor required to perform inspection and test.

H. Tools and labor for required disassembly and removal of covers, etc.

I. Equipment and labor required to perform functional test, if required.

J. The inspection article shall be displayed in an accessible, well-lit space to allow ease of inspection.

K. FAI procedure submitted to the Administration for approval 30 days in advance of the first FAI.

The Contractor shall not be permitted to schedule more than one (1) FAI per day without the prior written approval of the Administration.

### 16.7.2 Receiving Inspection

Receiving inspection activity shall provide for the inspection of all incoming material. Written procedures shall be implemented to assure items are inspected upon receipt to verify conformance to acceptance criteria of specifications, drawings, and purchase orders. All material certifications and test reports used as the basis for acceptance by the Contractor shall be preserved. A material identification system shall be used to preclude the use of incorrect or noncompliant materials during manufacture.

### 16.7.3 In-Process Inspection

The Contractor's Quality System shall ensure that all production operations, together with all processing and fabrication of any type, shall be performed under controlled conditions. Controlled conditions shall include documented work instructions, adequate production equipment, and any special working environment. The Quality System shall effectively monitor the issuance of and compliance with all of these work instructions. Inspection procedures shall be used where applicable. Inspection shall be accomplished in a systematic manner selected by the Contractor, subject to audit and surveillance by the Administration.

### 16.7.4 Hold-Point Inspection

The Contractor shall establish hold points in the teardown and production process to provide the most critical form of inspection. Hold points shall be utilized to inspect completed operations or installations. Hold points shall also be used to inspect items that are about to be covered by succeeding assembly operations. A list of hold-point inspections shall be submitted to the Administration for approval. Non-conforming products shall not be released from a hold point area until all discrepancies have been corrected. The Contractor shall use inspection forms to document all discrepancies found. The inspection forms shall be posted at or near the point of inspection for each vehicle and included with the Vehicle Overhaul History Book when all discrepancies have been eliminated. The Contractor shall submit a list of hold-point inspections to the Administration for review and approval.

The Contractor shall submit a list of hold point inspections to the Administration for review and approval. ***(CDRL 1604)*** The list of hold points shall include both surveillance and mandatory hold points that will be enforced by the Contractor staff. The Administration reserves the right to jointly witness any and all hold point inspections. In addition, the Administration retains the right to add up to five additional hold points, at its discretion, any time during the Contract. The additional hold points that may be required by the Administration, may be added or removed at the Contractor or its subcontractor facility, and shall be at the Administration's sole discretion.

### 16.7.5 Pre-Shipment Final Inspection

After factory testing and prior to shipment, the Contractor shall present each vehicle to the Administration for inspection. Before the Administration's final inspection, the vehicle shall be completed, final inspected, and accepted by the Contractor's QA/QC Department. All

workmanship items covered by prior inspection reports shall be corrected and all production and functional testing completed before final inspection begins. During the final inspection, all Contractor and subcontractor personnel shall vacate the vehicle, except as provided below. All Contractor inspection reports shall be made available to the Administration's inspectors at the time of final inspection.

The Contractor shall provide a qualified individual to accompany the Administration representative during final inspection. The Contractor's representative shall have the authority to assure that proper corrective action is taken. The Contractor shall provide labor and tools to remove or open and re-apply covers and doors. During final inspection, all systems shall be operational, with the use of approved types of special equipment or power supplies, where necessary.

### 16.7.6 Shipping Inspection

The Contractor's Quality System shall provide for the proper inspection of product to ensure completion of manufacture prior to shipment. Written procedures shall be prepared to ensure that all shipments shall be adequately prepared to preclude damage during shipment. These procedures shall include vehicle shipping preparation instructions and inspection procedures for vehicles scheduled for shipment to the acceptance site.

### 16.7.7 Outbound and Inbound Inspection

A joint outbound inspection shall be conducted by both the Contractor and the Administration to document the condition of each vehicle as it leaves the Administration's property. The Contractor shall conduct an inbound inspection with the Administration's resident inspector present at the Contractor's facility to confirm the results of the outbound inspection. Both the Contractor and Administration representatives shall sign off on the results of each inspection. The Contractor shall be responsible for preparing the inspection form for both the outbound and inbound inspection and shall submit it to the Administration for approval. Any equipment or items that are found to be missing after the completion of the outbound inspection will be the responsibility of the Contractor.

### 16.7.8 Post-Shipment Inspection

The Contractor shall conduct a receiving inspection on each vehicle upon arrival of the vehicle on Administration property. At its sole discretion, the Administration may choose to accompany the Contractor's inspector during this inspection. The results of the inspection shall be documented and included in the Vehicle Overhaul History Book. All discrepancies identified as having occurred during the shipping process shall be corrected according to TS Section 16.5.13.

### 16.7.9 Pre-Acceptance Final Inspection

After all post-shipment testing has been completed, the Administration shall conduct a final inspection.

## 16.8 MODIFICATION/RETROFIT PROGRAM

The Contractor shall develop a Modification Schedule to effect and inspect retrofits or modifications made to vehicle at the Contractor's site and on the Administration's property. When a retrofit or modification is made by the Contractor, it shall be to the entire fleet in kind, or, if approved by the Administration, on an effective vehicle basis. The Contractor's Quality Control shall verify and document the completion status of all current modifications at the time of final inspection. The Modification Schedule shall detail how activities will be coordinated among the various responsible parties to ensure that all required activities are accomplished. The Contractor shall also develop a matrix of all modifications performed and to be performed. The Modification Schedule matrix shall be updated and submitted to the Administration monthly.

## 16.9 SUBCONTRACTOR INSPECTION

Inspection of subcontractor products and materials shall be conducted at the subcontractor's facility.

The Contractor shall provide to the Administration a list of vendor items subject to FAI. This list shall include the projected schedule dates for each event. FAIs shall be performed in accordance with requirements in TS Section 16.7.1.

Once a product has been approved at FAI, the subcontractor may begin shipment of product to the Contractor's facility. Subcontractor pre-shipment inspections shall be scheduled prior to each shipment. The Contractor shall notify the Administration at least 30 days in advance of any shipment to allow the Administration to make travel arrangements. The subcontractor shall be required to provide similar inspection elements as defined for FAIs in TS Section 16.7.1, the only exception is that the pre-FAI inspection report identified in TS Section 16.7.1 shall be replaced with a production final inspection report.

Changed designs or poor manufacturing performance of the subcontractor may, at the sole discretion of the Administration, require a repeat of the FAI.

## 16.10 REQUIRED CDRLS

1601 Software Quality Assurance Plan (16.2) [Only Required for New Systems]

1602 Quality Plan (16.4.1)

1603 List of Items Subject to FAI (16.7.1)

1604 Hold-Point Inspection List (16.7.4)

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 5**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: July 1, 2013

Enclosed and effective this date is Addendum No.5 to the subject Contract. This Addendum reflects changes made to the solicitation as mentioned on the attached list.

Receipt of proposals to this solicitation will now be accepted on, but not after, 2:00 PM September 9, 2013 at the address:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
6 St. Paul, 7th Floor
Baltimore, MD 21202

as stated in the Addendum 5 items below.

The proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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Acknowledgement of receipt of ADDENDUM #5 to Solicitation #T-8000-0399

Vendor Name: _____

_____ _____
Authorized Representative's Signature Date

**A list of the changes made to this solicitation follows:**

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Contract Specifications | | |
|---|---|---|
| **Item No. (Referenced #)** | **Page or Section** | **Modification** |
| **One** | **Section I Page 1 of 7** | **Section A.1 <u>Schedule of Activities,</u> shall now read:**<br>**A.1 <u>Schedule of Activities</u>**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**<u>ITEM</u>** **<u>DATE</u>**<br><br>RFP Issue Date April 4, 2013<br><br>Pre-Proposal Conference April 17, 2013<br><br>Additional Vehicle Inspection May 21, 2013<br><br>Proposal Inquiry Deadline May 31, 2013<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~July 24, 2013~~ **September 09, 2013**<br><br>Anticipated Best and Final Offer (BAFO)~~September 30, 2013~~ **November 13, 2013**<br><br>Anticipated Selection Date ~~October 28, 2013~~ **December 09, 2013**<br><br>Anticipated Notice to Proceed ~~January 13, 2014~~ **March, 2014** |

| | | |
|---|---|---|
| **Two** | **Section I**<br>**Page 2 of 7** | **Section B.6 <u>Closing Date</u> shall now read:**<br>**B.6 <u>Closing Date</u>**<br><br>One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m**. local<br>time, ~~July 24, 2013~~ **September 9, 2013**, addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>~~1331 S. Monroe Street, 2nd Floor~~<br>~~Baltimore, Maryland 21230~~<br>**6 St. Paul, 7th Floor**<br>**Baltimore, MD 21202**<br><br>In addition, a separate sealed package containing one (1) original, five (5) copies, **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the** Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

| | | |
|---|---|---|
| **Three** | **Special Provisions B-2** | **Section B.2.5.1 <u>Closing Date</u> shall now read:**<br>One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard-copies and electronic copy must be submitted not later than **2:00 p.m.** local time, ~~July 24, 2013~~ **September 09, 2013** addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>~~1331 S. Monroe Street, 2nd Floor~~<br>~~Baltimore, Maryland 21230~~<br>**6 St. Paul, 7th Floor**<br>**Baltimore, MD 21202**<br><br>In addition, a separate sealed package containing one (1) original and five (5) copies, and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as **"Technical Proposal for Contract T-8000-0399"** or **"Price Proposal for Contract T-8000-0399"** as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

| | | |
|---|---|---|
| **Four** | **Special Provisions B-7** | **Section B.20 SCHEDULE OF ACTIVITIES shall now read:**<br><br>**B.20 SCHEDULE OF ACTIVITIES**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**ITEM** — **DATE**<br><br>RFP Issue Date — April 4, 2013<br><br>Pre-Proposal Conference — April 17, 2013<br><br>Additional Vehicle Inspection — May 21, 2013<br><br>Proposal Inquiry Deadline — May 31, 2013<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~July 24, 2013~~ **September 09, 2013**<br><br>Anticipated Best and Final Offer (BAFO) ~~September 30, 2013~~ **November 13, 2013**<br><br>Anticipated Selection Date — ~~October 28, 2013~~ **December 09, 2013**<br><br>Anticipated Notice to Proceed — ~~January 13, 2014~~ **March, 2014** |

# I. SOLICITATION INFORMATION AND INSTRUCTIONS

# SECTION I
# SOLICITATION INFORMATION AND INSTRUCTIONS
# MARC III KAWASAKI COACHES (63) OVERHAUL
# RFP T-8000-0399

## A. GENERAL

This section specifies the general requirements for the preparation and submittal of Proposals in response to this Request for Proposals (RFP).

### A.1 Schedule of Activities

The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.

| ITEM | DATE |
|---|---|
| RFP Issue Date | April 4, 2013 |
| Pre-Proposal Conference | April 17, 2013 |
| Additional Vehicle Inspection | May 21, 2013 |
| Proposal Inquiry Deadline | May 31, 2013 |
| Closing Date for Receipt of Proposals (2:00 p.m.) | September 9, 2013 |
| Anticipated Best and Final Offer (BAFO) | November 13, 2013 |
| Anticipated Selection Date | December 9, 2013 |
| Anticipated Notice to Proceed | March, 2014 |

## B. PREPARATION OF PROPOSAL

### B.1 General

The MTA is soliciting an RFP that explains how the Proposer will meet the requirements of this procurement. Statements merely indicating that the Proposer will meet specific requirements are not acceptable. Technical descriptions should be such that the Administration is able to relate what is being offered to equipment that has been used in revenue service on other rail transit systems.

The MTA recognizes that there may be elements of the Proposal considered proprietary and confidential by the Proposer. The Proposal shall identify any specific information or design details that the Proposer considers proprietary. The Proposer shall clearly and prominently mark each and every page or sheet of such materials with "CONFIDENTIAL" and "PROPRIETARY," as it determines to be appropriate.

The MTA will disclose the information only in accordance with the Maryland Public Information Act. Under no circumstances, however, will the MTA be responsible or liable to the Proposer or any other party for the disclosure of such labeled material, for any reason whatsoever.

**B.2 Issue Date**

**April 4, 2013**

**B.3 Issuing Office**

This RFP is issued by the Office of Procurement of the Maryland Transit Administration and the sole point of contact for contractual questions. This office is the sole point of contact in the MTA for this RFP.

**B.4 Inquiries**

Inquiries and/or questions concerning this proposal shall be submitted in writing on Form 22, Section IV, Exhibit A1, and e-mailed to the Procurement Officer designated below:

**Heidi J. Tarleton**
**Office of Procurement**
**Maryland Transit Administration**
**E-Mail: htarletonprocurementofficer@mta.maryland.gov**

All inquiries and the corresponding MTA responses will be posted on the MTA website at http://www.mta.maryland.gov/solicitations. All questions and requests must be received at the e-mail address specified above no later than 4:00 p.m., local time on **May 31, 2013**.

No requests or inquiries will be considered unless delivered as specified above. The e-mail submitting questions must include the requestor's name, e-mail address, telephone and fax numbers, and the Proposer he/she represents.

**B.5 Submittal of Proposals**

Proposals shall be submitted under the following guidelines.

**B.6 Closing Date**

One (1) original bound Technical Proposal, ten (10) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m**. local

time, **September 9, 2013**, addressed to:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
**6 St. Paul, 7th Floor**
**Baltimore, MD 21202**

In addition, a separate sealed package containing one (1) original and **five (5) copies, and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format)** of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted.

## B.7 Addenda and Supplements

In the event that it becomes necessary to revise any part of this RFP, or if additional information is necessary to enable the Proposer to make an adequate interpretation of the provisions of the RFP, a supplement will be provided to firms who are identified as holders of the RFP.

## B.8 Acknowledgment of Addenda

The Proposer shall acknowledge receipt of all addenda in the cover letter of the Technical Proposal. Failure to acknowledge all addenda shall cause the rejection of the Proposal.

## B.9 Language Requirement

All language in the Proposal shall be prepared in English. All Contract documents, conferences, letters, technical information, and drawings shall be conducted or offered solely in the English language. All dimensions shall be in the U.S. inch/pound units and metric equivalent, if applicable.

## B.10 Proposal Clarity and Completeness

To be considered, the Proposer is to submit a complete response to the RFP addressing the items requested. Proposal brevity and clarity are desired. The Proposer is advised that the MTA is not obligated to expend extraordinary effort if the Proposal is unclear, difficult to assess, and/or incomplete. At the sole discretion of the MTA such Proposals may be classified as unacceptable.

## B.11 Oral Presentation

The Proposer will be required to make individual presentations or demonstrations in order to clarify their Proposals and to verify technical submissions. The MTA will not be responsible for any costs incurred by the Proposer in the preparation of oral presentations.

## B.12 Incurring Costs

The MTA is not liable for any cost incurred by the Offeror in preparation of its Proposal for this Contract.

## C. SUBMITTAL OF PRICE PROPOSALS

The Price Proposal and the Technical Proposal, and any other documents as may be specified when executed and submitted by the Offeror, will constitute his Proposal. Price Proposals not presented on the Unit Price Schedule will not be considered. The Price Proposal shall be filled out in ink or typewritten. If erasures or changes appear in the Price Proposal, each erasure or change shall be initialed and dated by the individual signing the Price Proposal.

All documents bound with or attached to the Proposal are considered a part thereof and shall not be detached or altered when the Proposal is submitted. Proposals shall be submitted in the manner specified.

The Offeror shall specify a price in U.S. dollars for each item given and shall show the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Proposal obtained by adding the amounts of the several items.

## D. PRE-PROPOSAL CONFERENCE

A conference for all Offerors will be held on **April 17, 2013** at the **MARC Martins Maintenance Facility, 2700 Eastern Blvd, Middle River, Maryland 21220**, beginning at 9**:00 a.m**. All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team.

## E. DISCUSSIONS

The Administration may enter into discussions with all Qualified Offerors. The term "Qualified Offerors" includes only those responsible Offerors who submitted proposals initially judged by the Procurement Officer to be reasonably susceptible of being selected for award. Discussions shall be led by the Offeror's Project Manager and will consist of an oral presentation by the Offeror to the Administration's Evaluation Committee, questions from and negotiations with the Committee and Procurement Officer. Offerors shall be notified of the time, date, and location of the discussions. **Submission of a proposal does not guarantee an Offeror the opportunity to be invited in for discussions.**

The Administration retains the right, at its discretion, not to hold discussions with Offerors and may award a contract on the basis of technical and price proposals as submitted if,

in the judgment of the Procurement Officer, the response to this RFP demonstrates sufficient competition so that acceptance of an initial offer without negotiation would result in a fair and reasonable price.

## F. BEST AND FINAL OFFERS (BAFO)

When it is in the best interest of the State, the Procurement Officer may permit qualified Offeror(s) to revise their initial proposals by submitting BAFO. This action is in accordance with COMAR 21.05.03.03.D.

## G. THE PROPOSALS

To be considered, Offerors shall submit a complete response to the RFP using the format provided. This proposal format is mandatory. Proposals should provide a straightforward, concise delineation of the Offeror's capability to satisfy the requirements of this RFP.

## H. SIGNATURES

Each proposal shall be signed by an officer authorized to make a binding commitment for the firm(s) making the proposals.

## I. DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

1. **DISADVANTAGED BUSINESS ENTERPRISES ARE ENCOURAGED TO RESPOND TO THIS SOLICITATION NOTICE.**

2. The Maryland Transit Administration hereby notifies all Offerors that, in regard to any Contracts entered into pursuant to this advertisement, Disadvantaged Business Enterprises will be afforded full opportunity to submit Proposals in response to this Notice, and will not be subjected to discrimination on the basis of political or religious opinion or affiliation, race, color, creed, sex, age or national origin in consideration for an award.

3. It is the goal of the Administration that Disadvantaged Business Enterprises participate in all Contracts. Each Contract will contain goals for Disadvantaged Business Enterprise participation on a contracts-to-contracts basis. A subcontracting goal of thirteen percent (9%) has been established for this procurement**.** All bidders/Offeror must submit with their proposal a fully executed copy of the Certified DBE Utilization and Fair Solicitation Affidavit (MDOT DBE FORM A) and DBE Participation Schedule (MDOT DBE FORM B). **Failure to submit the required documents with offer shall result in the Offeror's Technical Proposal as not being deemed reasonably susceptible of being selected for award.**

4. **A Offeror may count toward its DBE goal 60 percent of its expenditures for materials and supplies required under the contract and obtained from a DBE regular dealer, and 100 percent of such expenditures to a DBE manufacturer. The DBE credited supplies may not exceed 60 percent of the entire contract goal.**

5. ALL DBE FIRMS MUST BE CERTIFIED BY THE MARYLAND DEPARTMENT OF TRANSPORTATION AT THE TIME OF TECHNICAL PROPOSAL SUBMITTAL. NO OTHER CERTIFICATIONS WILL BE ACCEPTED. **This process takes an average of SIX months.** By submitting a response to this RFP, the Offeror agrees that, as a minimum, this percentage of the contracts price will be allocated to DBE's.

6. DBE Participation in work performed under this contract will be monitored by the State and must be in accordance with Exhibit E (Contract Exhibits).

7. **Questions or concerns regarding the DBE requirements of this solicitation must be raised before the receipt of technical proposals.**

8. A current directory of DBE/MBE's is available through the Maryland State Department of Transportation, Office of Minority Business Enterprise, P. O. Box 548, 7201 Corporate Center Drive, Hanover, Maryland 21076. The phone number is 410-865-1269 or 1-800-544-6056.

9. **The directory is also available at** http://www.mdot.state.md.us**. Select the Minority/Disadvantaged Business Enterprise link at the left side of the web site, half way down. The most current and up-to-date information on DBE/MBE's is available via this website.**

## J. COMPLIANCE WITH LAW

By submitting an offer in response to this RFP, the Proposer, if selected for award, agrees that it will comply with all Federal, State, and local laws applicable to its activities and obligations under the contract. By submitting an Offer in response to this RFP, the Proposer shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and employee benefits, and if selected for award, that it shall not become so in arrears during the term of the contract.

## K. ACCEPTANCE OF TERMS AND CONDITIONS

By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.

## L. CONFLICT OF INTEREST - CONFIDENTIALITY

The Proposer covenants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of services under this RFP. Without limitation, the Proposer represents to and agrees with the State that the Proposer has no conflict of interest between providing the State services hereunder and any interest the Proposer may have with respect to any other person or entity (including but not limited to any Federal or State regulatory agency) which has any interest adverse or potentially adverse to the State.

The selected Proposer agrees that any information, whether proprietary or not, made known to or discovered by it during the performance of, or in connection with, this RFP will be kept confidential and not be disclosed to any person other than the State, its designated officials, employees, and authorized agents. The Proposer agrees to immediately notify the State in writing if it is requested to disclose any information made known to or discovered by it during the performance of or in connection with this RFP.

## M. PROTESTS

Any protest relating to this solicitation or the award of a contract must be filed in accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotate Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

## N. INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's proposal in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the contract to be entered into as a result of this RFP.

## O. MEDIA ANNOUNCEMENTS

No media announcements written or oral, pertaining to this RFP or the services, study or project to which it relates shall be made without Administration approval and then only in coordination with the issuing office.

## P. USE OF "e-MARYLAND MARKETPLACE"

"E-Maryland Marketplace" is an electronic commerce system administered by the Maryland Department of General Services. This means that all such information is immediately available to subscribers to e-Maryland Marketplace. Because of the instant access afforded by e-Maryland Marketplace, it is recommended that all Bidders interested in doing business with Maryland State agencies subscribe to e-Maryland Marketplace.

**In order to receive a contracts award, a vendor must be registered on e-Maryland Marketplace.**

## B. PROPOSAL REQUIREMENTS

# B. PROPOSAL REQUIREMENTS

## B.1 GENERAL

In addition to the General Provisions, this section specifies the general requirements for the preparation and submittal of Proposals in response to this Request for Proposals (RFP).

## B.2 PREPARATION OF PROPOSAL

### B.2.1 General

The MTA is soliciting an RFP that explains how the Proposer will meet the requirements of this procurement. Statements merely indicating that the Proposer will meet specific requirements are not acceptable. Technical descriptions should be such that the MTA is able to relate what is being offered to equipment that has been used in revenue service on other rail transit systems.

The MTA recognizes that there may be elements of the Proposal considered proprietary and confidential by the Proposer. The Proposal shall identify any specific information or design details that the Proposer considers proprietary. The Proposer shall clearly and prominently mark each and every page or sheet of such materials with "CONFIDENTIAL" and "PROPRIETARY," as it determines to be appropriate.

The MTA will disclose the information only in accordance with the Maryland Public Information Act. Under no circumstances, however, will the MTA be responsible or liable to the Proposer or any other party for the disclosure of such labeled material, for any reason whatsoever.

### B.2.2 Issue Date

April 4, 2013

### B.2.3 Issuing Office

This RFP is issued by the Office of Procurement of the Maryland Transit Administration and the sole point of contact for contractual questions. This office is the sole point of contact in the MTA for this RFP.

### B.2.4 Inquiries

Inquiries concerning this proposal shall be submitted in writing to the Office of Procurement, Maryland Transit Administration, 1331 S. Monroe Street, Second Floor, Baltimore, Maryland 21230, Attention: Heidi J. Tarleton (410) 454-7895. All inquiries and the corresponding MTA response will be posted on the e-Maryland Marketplace web site. Closing date for receipt of inquiries is **May 13, 2013**.

### B.2.5 Submittal of Proposals

Proposals shall be submitted under the following guidelines.

#### B.2.5.1 Closing Date

One (1) original bound Technical Proposal, six (6) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard-copies and electronic copy must be submitted not later than **2:00 p.m.** local time, **September 9, 2013** addressed to:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
**6 St. Paul, 7th Floor**
**Baltimore, MD 21202**

In addition, a separate sealed package containing **one (1)** original and **five (5)** copies **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format**) of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as **"Technical Proposal for Contract T-8000-0399"** or **"Price Proposal for Contract T-8000-0399"** as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted.

#### B.2.5.2 Addenda and Supplements

In the event that it becomes necessary to revise any part of this RFP, or if additional information is necessary to enable the Proposer to make an adequate interpretation of the provisions of the RFP, a supplement will be provided to firms who are identified as holders of the RFP.

#### B.2.5.3 Acknowledgment of Addenda

The Proposer shall acknowledge receipt of all addenda in the cover letter of the Technical Proposal. Failure to acknowledge all addenda shall cause the rejection of the Proposal.

#### B.2.5.4 Language Requirement

All language in the Proposal shall be prepared in English. All Contract documents, conferences, letters, technical information, and drawings shall be conducted or offered solely in the English language. All dimensions shall be in the U.S. inch/pound units and metric equivalent, if applicable.

### B.2.5.5 Proposal Clarity and Completeness

To be considered, the Proposer is to submit a complete response to the RFP addressing the items requested. Proposal brevity and clarity are desired. The Proposer is advised that the MTA is not obligated to expend extraordinary effort if the Proposal is unclear, difficult to assess, and/or incomplete. At the sole discretion of the MTA such Proposals may be classified as unacceptable.

### B.2.5.6 Oral Presentation

The Proposer may be required to make individual presentations or demonstrations in order to clarify their Proposals and to verify technical submissions. The MTA will not be responsible for any costs incurred by the Proposer in the preparation of oral presentations.

### B.2.5.7 Incurring Costs

The MTA is not liable for any cost incurred by the Offeror in preparation of its Proposal for this Contract.

### B.2.5.9 Multiple Proposals

If the Offeror has more than one (1) method or more than one (1) subcontractor for meeting the objectives of the RFP, multiple Proposals may be submitted. Additional Proposals may be prepared in an abbreviated form following the same format as the primary Proposal, but containing only that information which differs in any way from the primary Proposal. Each Proposal must be bound separately and submitted in accordance with Section B.2.5.1 above. In all cases, to be considered responsive, each Proposal must clearly meet the objectives and needs of the Administration.

## B.3 ANTI-DUMPING ACT

Foreign Offerors shall represent and warrant that their prices do not violate the United States Anti-Dumping Act, U.S. Code, Title 19, Section 160 et seg., as amended. They shall agree to pay any duties assessed under the said Act and to indemnify and hold harmless the Administration from any loss or expense, including but not limited to reasonable attorney's fees that the Administration may incur from any claim, demand, or investigation of alleged violation of the said Act.

## B.4 SUBMITTAL OF PRICE PROPOSALS

The Price Proposal and the Technical Proposal, and any other documents as may be specified when executed and submitted by the Offeror, will constitute his Proposal. Price Proposals not presented on the Unit Price Schedule will not be considered. The Price Proposal shall be filled out in ink or typewritten. If erasures or changes appear in the Price Proposal, each erasure or change shall be initialed and dated by the individual signing the Price Proposal.

All documents bound with or attached to the Proposal are considered a part thereof and shall not be detached or altered when the Proposal is submitted. Proposals shall be submitted in the manner specified.

The Offeror shall specify a price in U.S. dollars for each item given and shall show the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Proposal obtained by adding the amounts of the several items.

## B.5 PROPOSAL BID BOND

A Proposal Bid Bond is **NOT REQUIRED** for this contract.

## B.6 ARREARAGES

By submitting a response to this RFP, an Offeror shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing to the State of Maryland, including the payment of taxes and employee benefits, and that it shall not become so in arrears during the term of the contract if selected for contract award.

## B.7 PRE-PROPOSAL CONFERENCE

A conference for all Offerors will be held on **April 17, 3013** at the **MARC Martins Maintenance Facility, 2700 Eastern Blvd., Middle River, Maryland 21220** beginning at **9:00 am** followed by a site inspection. The site inspection shall afford the Offerors an opportunity to inspect a representative vehicle(s). All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team.

## B.8 DISCUSSIONS

The Administration may enter into discussions with all Qualified Offerors. The term "Qualified Offerors" includes only those responsible Offerors who submitted proposals initially judged by the Procurement Officer to be reasonably susceptible of being selected for award. Discussions shall be led by the Offeror's Project Manager and will consist of an oral presentation by the Offeror to the Administration's Evaluation Committee, questions from and negotiations with the Committee and Procurement Officer. Offerors shall be notified of the time, date, and location of the discussions. **Submission of a proposal does <u>not</u> guarantee an Offeror the opportunity to be invited in for discussions.**

The Administration retains the right, at its discretion, not to hold discussions with Offerors and may award a contract on the basis of technical and price proposals as submitted if, in the judgment of the Procurement Officer, the response to this RFP demonstrates sufficient competition so that acceptance of an initial offer without negotiation would result in a fair and reasonable price.

## B.9 THE PROPOSALS

To be considered, Offerors shall submit a complete response to the RFP using the format provided. This proposal format is mandatory. Proposals should provide a straightforward, concise delineation of the Offeror's capability to satisfy the requirements of this RFP.

## B.10 SIGNATURES

Each proposal shall be signed by an officer authorized to make a binding commitment for the firm(s) making the proposals.

## B.11 MINORITY BUSINESS ENTERPRISE

1. It is the goal of MTA that Minority Business Enterprises (MBE) participate in all projects. The MTA hereby notifies all Proposers that in regard to any contract entered into pursuant to this RFP, MBEs will not be subject to discrimination on the basis of race, color, sex, or national origin in consideration for an award.

    a. An overall DBE subcontract participation of **9% of the total contract dollar amount** has been established for this procurement.

2. A fully executed "Certified DBE Utilization and Fair Solicitation Affidavit" and "DBE Participation Schedule" shall be submitted with the Technical Proposal. Failure to submit the required documents with the Offer shall result in the Proposer's Proposal as being not reasonably susceptible of being selected for award.

3. ALL DBE FIRMS PROPOSED MUST BE CERTIFIED BY MDOT hh TIME OF SUBMITTAL OF PROPOSAL. This process takes an average of six months. By submitting a response to this RFP, the Proposer agrees that, as a minimum, this percentage of the contract price will be allocated to DBEs.

4. MBE Participation in work performed under this contract will be monitored by the State and must be in accordance with **Exhibit E (Contract Exhibits)**.

5. Questions or concerns regarding the DBE requirements of this solicitation must be raised before the opening of bids or receipt of initial proposals.

6. A current directory of MBEs is available through the Maryland State Department of Transportation, Office of Minority Business Enterprise, P.O. Box 548, 7201 Corporate Center Drive, Hanover, Maryland 21076. The phone number is 410-865-1269 or 1-800-544-6056.

7. The directory is also available at http://www.mdot.state.md.us. Select the MBE Program label at the left side of the web site, half way down. The most current and up-to-date information on MBEs is available via this web site.

## B.12 PROMPT PAYMENT OF SUBCONTRACTORS

This procurement and the contract to be awarded pursuant to this solicitation are subject to the Prompt Payment Policy Directive issued by the Governor's Office of Minority Affairs (GOMA) and dated August 1, 2008. Promulgated pursuant to Sections 11-201, 13-205(a), and Title 14, Subtitle 3 of the State Finance and Procurement Article (SFP), and Code of Maryland Regulations (COMAR) 21.01.01.03 and 21.11.03.01 et seq., the Directive seeks to ensure the prompt payment of all subcontractors on non-construction procurement contracts. The successful Offeror who is awarded a contract must comply with the prompt payment requirements. Additional information is available on the GOMA website at www.mdminoritybusiness.com.

## B.13 COMPLIANCE WITH LAW

By submitting an offer in response to this RFP, the Proposer, if selected for award, agrees that it will comply with all Federal, State, and local laws applicable to its activities and obligations under the contract. By submitting an Offer in response to this RFP, the Proposer shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and employee benefits, and if selected for award, that it shall not become so in arrears during the term of the contract.

## B.14 ACCEPTANCE OF TERMS AND CONDITIONS

By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.

## B.15 CONFLICT OF INTEREST - CONFIDENTIALITY

The Proposer covenants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of services under this RFP. Without limitation, the Proposer represents to and agrees with the State that the Proposer has no conflict of interest between providing the State services hereunder and any interest the Proposer may have with respect to any other person or entity (including but not limited to any Federal or State regulatory agency) which has any interest adverse or potentially adverse to the State.

The selected Proposer agrees that any information, whether proprietary or not, made known to or discovered by it during the performance of, or in connection with, this RFP will be kept confidential and not be disclosed to any person other than the State, its designated officials, employees, and authorized agents. The Proposer agrees to immediately notify the State in writing if it is requested to disclose any information made known to or discovered by it during the performance of or in connection with this RFP.

## B.16 PROTESTS

Any protest relating to this solicitation or the award of a contract must be filed in

accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotate Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

## B.17 INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's proposal in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the contract to be entered into as a result of this RFP.

## B.18 MEDIA ANNOUNCEMENTS

No media announcements written or oral, pertaining to this RFP or the services, study or project to which it relates shall be made without Administration approval and then only in coordination with the issuing office.

## B.19 USE OF "E-MARYLAND MARKETPLACE"

"E-Maryland Marketplace" is an electronic commerce system administered by the Maryland Department of General Services. In addition to using the MTA web site (https://emaryland.buyspeed.com) and other means for transmitting the RFP and associated materials, the solicitation and minutes of the pre-proposal conference, proposer questions and MTA responses, addenda, and other solicitation related information will be provided via e-Maryland Marketplace.

## B.20 SCHEDULE OF ACTIVITIES

The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.

| ITEM | DATE |
|---|---|
| RFP Issue Date | **April 4, 2013** |
| Pre-Proposal Conference and vehicle inspection (**TBD**) | **April 17, 2013** |
| **Additional Vehicle Inspection** | **May 21, 2013** |
| Proposal Inquiry Deadline | **May 31, 2013** |
| Closing Date for Receipt of Proposals (2:00 p.m.) | **September 9, 2013** |
| Anticipated Best and Final Offer (BAFO) | **November 13, 2013** |
| Anticipated Selection Date | **December 9, 2013** |
| Anticipated Notice to Proceed | **March, 2014** |

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 4**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: June 21, 2013

Enclosed and effective this date is Addendum No.4 to the subject Contract. This Addendum reflects changes made to the solicitation as mentioned on the attached list and includes responses to Planholder's written questions in Addendum No. 4 - Attachment A. Responses to Planholder's written questions 1-16 were issued in Addendum No. 2

The proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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Acknowledgement of receipt of ADDENDUM #4 to Solicitation #T-8000-0399

Vendor Name: _____

_____ _____
Authorized Representative's Signature Date

**A list of the changes made to this solicitation follows:**

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Contract Specifications | | |
|---|---|---|
| **Item No. (Referenced #)** | **Page or Section** | **Modification** |
| One (Q #26, 27) | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Section** 4.4.1 ***MARC III Coaches Out of Service*****, paragraph 2, shall now read:**<br><br>The Contractor shall be limited to a not-to-exceed of six MARC III coaches removed from MARC possession at any one time during the Contract; and the Contractor shall plan work according to this restriction. The not-to-exceed limit of ~~two~~ MARC III coaches includes MARC III coaches that are not available for revenue service due to Contractor activities such as acceptance testing and equipment retrofits. The MTA shall not allow more than two overhauled MARC III coaches to remain unaccepted on MTA property. |
| Two (Q #36) | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Section F.4.2** ***Warranty Period- Specific Subsystems*****, shall now read:**<br>**F.4.2 Not used.**<br>~~In addition to the general warranties specified above, the Contractor warrants that the items listed in Section F.4.2.1 shall provide the indicated service in years or miles, whichever occurs first. The warranty period starts from the date of conditional acceptance of each MARC III coach by the Administration~~. |

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| Three<br>(Q #47) | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Section 1.2.3 *Overhaul Requirements Weld Inspection Plan*, paragraph 6, shall now read:**<br><br>Remove all covers of the undercar 480 VAC duct bank and wiring and ducts. Inspect and clean all cleat block connections, cable connections, and separators. ~~Recondition~~ **Overhaul** duct bank covers and reinstall. |
| Four<br>(Q #53, 54) | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Section 1.2.8 *Windows*, paragraph 1, shall now read:**<br><br>All existing passenger side window and windshield glazing, sash glass, and mounting rubber shall be removed. All glazing shall be ~~inspected and cleaned. The Contractor shall submit a criteria document for determining if the window glazing requires replacement. [CDRL 102] As part of this plan, the Contractor shall submit replacement material specifications for Administration review and approval. For estimating purposes it is expected that 25% of glazing will be replaced.~~ **renewed. All overhauled MARC III cars, including VRE style MARC III cars, shall match with identical frames, glazing and gaskets.** |
| Five<br>(Q #69) | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Section 2.4.4 *Radius Arms*, after paragraph 1, shall now read:**<br><br>Radius arm rubbers shall be replaced ~~if found worn, or damaged~~.<br><br>All cotter pins, nuts, and bolts shall be replaced.<br><br>The drilled bolt used in the attachment of the end cap to the radius rubber holder shall have a hole sufficient for the cotter pin and shall not affect the strength of the bolt.<br><br>Existing roller bearing seats of the radius arms shall be cleaned, inspected, and overhauled in accordance with the OEM recommendations ~~or shall be renewed.~~ |

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| Six<br>(Q #71, 72, 73) | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Section 2.4.8 *Electrical, Electrical Conduit, and Piping*, first 3 paragraphs, shall now read:**<br><br>**Any PTC related truck equipment including speed sensors, axle generators associated wiring and junction boxes shall be overhauled. The MTA does not expect replacement of any PTC related equipment. ~~New magnetic wheel slide speed sensor cable assemblies shall be installed.~~**<br><br>**~~New event recorder/alerter and automatic announcement system speed sensor shall be installed.~~**<br><br>**~~A new axle generator shall be installed as part of the new 9-aspect cab signal/ATC system installation work being performed by WABTEC with their PTC installation program~~**. |
| Seven<br>(Q #75) | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Section 2.4.10 *Electrical Grounding*, paragraph 1, shall now read:**<br><br>Axle end grounding contacts shall be ~~overhauled or replaced~~ **renewed**. Carbon brushes shall be ~~replaced~~ **renewed**. Spring supports shall be ~~replaced~~ **renewed**. Sealing O-ring shall be ~~replaced~~ **renewed**. |
| Eight<br>(Q #80) | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4 *Scope of Work*, Items Q and R, shall now read:**<br><br>~~**Q. Sanding Control Valves and Sanding Nozzles (Cab Control Cars)**~~<br>~~**R.**~~ **Q.** Horn Valve (Cab Control Cars) |
| Nine<br>(Q #82) | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4.3 *Truck Mounted Brake Units*, paragraph 1, shall now read:**<br><br>Tread brake units shall be overhauled per OEM specifications. Mechanical linkages shall be ~~**evaluated for wear and**~~ renewed per OEM specifications. |

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| Ten<br>(Q #84) | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Section 4.4.5 *Handbrake*, paragraph 1, shall now read:**<br><br>The handbrake system shall be overhauled per OEM procedures. All linkages, bushings, and pins shall be ~~evaluated for wear,~~ renewed ~~or replaced~~. The hand lever shall be overhauled, cleaned, and painted. |
| Eleven<br>(Q #87) | **Section VI Technical Specifications**<br><br>**Section 05 Electrical** | **Section 5.2.5 *Relays, Contactors, and Other Components*, paragraph 4, shall now read:**<br><br>~~All passenger compartment overhead and floor heating elements shall be cleaned, inspected and tested. All space heater modules (Operator, Observer and toilet compartment) shall be cleaned, inspected and tested~~. Any damaged or failed components shall be renewed. See any additional requirements as noted in TS Section 15. |
| Twelve<br>(Q #99) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.4 *Side Doors*, Item D. Gear Box, shall now read:**<br><br>**D. Gear Box.** ~~The gear box shall be removed, cleaned, and inspected. The gears shall be inspected to assure that the gears rotate freely and mesh accurately without backlash.~~ **The gear box shall be overhauled per OEM specification.** All gaskets shall be replaced. |
| Thirteen<br>(Q #101) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.4 *Side Doors*, Item E. Mechanical Lock Assembly, shall now read:**<br><br>E. **Mechanical Lock Assembly**. The mechanical door lockout assembly shall ~~be removed cleaned and inspected.~~ **comply with APTA SS-M-10 Paragraphs 2.8.1 and 2.9.** The operation of the cutout switch shall be verified. |
| Fourteen<br>(Q #14) | **Section VI Technical Specifications** | **Section 9.4 *Side Doors*, Item J. Emergency Door Release Assemblies, shall now read:**<br><br>J. **Emergency Door Release Assemblies**. The Contractor shall inspect all Emergency Door Release Assemblies for function and ease of use. All cable |

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| | **Section 09 Door and Door Control** | assemblies shall be inspected. The ~~Contractor shall test that all~~ interior and exterior emergency releases **shall** operate in accordance with **the current revision of** APTA Standard SS-C&S-012-02~~. The Administration shall be allowed to witness testing.~~ |
| Fifteen (Q #105, 106) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.4 *Side Doors*, Item M. Sensitive Edge Assembly and Switch, shall now read:**<br><br>**M. Sensitive Edge Assembly and Switch.** The Contractor shall renew the sensitive edge assembly and pressure wave switch with an OEM switch, **upgraded to the latest configuration per the OEM recommendation,** or Administration approved equal. The proper mounting and routing of the pneumatic tubing between the sensitive edge assembly and the pressure wave switch shall be verified. **Controls for the doors shall be arranged so that obstruction sensing by the panel edge complies with APTA SS-C&S-012-02.** |
| Sixteen (Q #111) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.1 *General System Description*, shall now read:**<br><br>Each MARC III car is equipped with side doors, end doors and vestibule doors. The side doors utilize existing door operators with controls at each door and in the cab. The non-cab and cab end doors are fully mechanical and are equipped with locking mechanisms. The vestibule doors are electrically powered by an overhead door operator and will have a proposed alternate design using linear ~~synchronous~~ motor technology or permanent magnet type ~~synchronous~~ motor technology and microprocessor control. |
| Seventeen (Q #111) | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Section 9.6 *Vestibule Doors*, paragraph 2, shall now read:**<br><br>The Contractor shall propose an alternate design to the existing electrically operated overhead door operator and touch switch. **[CDRL 904]** The alternate design shall utilize linear ~~synchronous~~ motor technology or permanent magnet type ~~synchronous~~ motor technology and microprocessor control. The alternate design shall maintain the OEM door panel Carbody interfaces and utilize the existing door panel design in the alternate proposal. As part of the alternate door proposal, the contractor shall propose a new vestibule door OPEN touch switch design for Administration approval. All vestibule door touch plates shall be replaced with the new design. |

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| Eighteen (Q #112, 113) | **Section VI Technical Specifications**<br><br>**Section 10 HVAC Unit and Controls** | **Section 10.3.1 *Temperature Controller*, paragraph 1, sentence 1, shall now read:**<br><br>The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with a Vapor Temperature Control Unit (part no. 2010400017) or an Administration approved equivalent microprocessor controller compatible with the existing control voltages and control logic developed by the OEM. |
| Nineteen (Q #114) | **Section VI Technical Specifications**<br><br>**Section 10 HVAC Unit and Controls** | **Section 10.3.3 *HVAC Unit*, paragraph 1, sentences 2-4, shall now read:**<br><br>The existing HVAC units were originally manufactured by Stone Service Corporation. The existing system utilizes refrigerant R-22. The existing system shall be modified and designed for use with refrigerant R-407c **or R-410a**. The contractor shall present details of any required unit modification for the refrigerant change to the Administration for review.<br><br>**Section 10.3.4 *Compressor Condenser Section*, paragraph 2, shall now read:**<br><br>The scroll compressors shall be replaced with new scroll compressors that are sized for and compatible with the R-407c **or R-410a** replacement refrigerant. The compressor isolation mounts and hardware shall be renewed. All Rotolock fittings shall have their seals renewed. The compressor crankcase heaters shall be renewed. Vibration eliminators shall be cleaned inside and out and inspected for damage. |
| | | **Section 12.1 *General System Description*, paragraph 3, shall now read:**<br><br>Cab Cars are equipped with a GPS and wireless modem ~~from ENSCO, Inc.; 5400 Port Royal Rd.; Springfield, VA; model RM-MU-4-R0DUAL. This system is available for the Contractor's use in aiding~~ **to aide** in the determination of vehicle location and to communicate data to and from the |

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| Twenty (Q #116, 118, 119, 126) | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions**<br><br>**Continued from previous page.** | wayside. ~~The contractor shall include in their scope of work any expansion of the AVL necessary to meet the Overhaul requirements.~~<br><br>**Section 12.3.4 *Automated Announcement System*, Item C. Wayside to Train Communication, paragraph 2, shall now read:**<br><br>The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the wireless data connection or~~ supply and install a separated data modem and antenna.<br><br>**Section 12.3.4 *Automated Announcement System*, Item D. Train Position, paragraph 4, shall now read:**<br><br>The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the GPS data or~~ supply and install a separated DGPS receiver and antenna. If the contractor opts to supply a separate DGPS receiver and antenna the contractor shall supply an analysis to show that the location of the antenna does not interfere with or is not affected by other existing antennas on the vehicle.<br><br>**Section 12.3.4 *Automated Announcement System*, Item J. GPS Receiver and Antenna, paragraph 1, shall now read:**<br><br>The contractor **shall** ~~may utilize the existing ENSCO system equipment as a source of the GPS data or~~ supply and install a separated DGPS receiver and antenna. Should the Contractor provide a separate DGPS receiver and antenna, the following requirements apply. |
| Twenty-one (Q #125) | **Section VI Technical Specifications**<br><br>**Section 12 Communicati ons** | **Section 12.3 *Scope of Work*, paragraph 3, shall now read:**<br><br>All trainline communication shall be compatible with existing MARC cars. The PA/IC functions shall be included ~~**in the digital audio trainlines in the cabling for the digital train network (DTN), while the conventional baseband audio trainlines shall be included**~~ in the door and communications trainline ~~system~~. The cars shall utilize analog communication for intra-car communication. All **replaced** cabling **used for data/communication** shall be shielded twisted pairs capable of digital communication transmission. |

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| Twenty-two (Q #128) | **Section VI Technical Specifications**<br><br>**Section 12 Communications** | **Section 12.3.2 *Public Address and Intercom System*, paragraph 4, shall now read:**<br><br>Each PA announcement made by a crew member shall be recorded and stored digitally in the cab car ~~and/or locomotive~~. The announcements shall be digitally recorded, vox controlled, and stored in non-volatile memory. The storage memory shall have sufficient capacity to store not less than eight (8) hours of PA announcements with a memory organized in a "first in first out" basis. The system shall permit the downloading of announcement information to PC and removable PC memory card (PCMCIA or USB), and via the wireless wayside to train link. The following shall be maintained for each PA announcement. |
| Twenty-three (Q #152) | **Section VI Technical Specifications**<br><br>**Section 16 Quality Assurance** | **Section 16.1 *General System Description*, paragraphs 1 and 2, shall now read:**<br><br>The Contractor's Quality System efforts shall be in compliance with the requirements of ~~ANSI/ASQ Q9001-1994~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision**. Where it differs from the terms of the Contract, the more stringent requirement shall take precedent. The Contractor need not be certified under ~~ANSI/ASQ Q9001-1994~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision**.<br><br>The Contractor shall establish, implement and execute a comprehensive system to assure that all aspects of the work are in conformance with the Administration's contract. The Quality System shall include the Contractor's Quality System Manual, Quality Plan, and all implementing manuals, processes, and procedures. The Quality System Manual shall state the Quality Policy, definition of responsibilities, and authority of personnel who manage and perform work affecting quality. It shall include all procedures for implementing the required ~~ANSI/ASQ Q9001-1994~~ **ANSI/ISO/ASQ Q9001-2008 or latest revision** standard. |
| Twenty-four | **Section VI Technical Specifications**<br><br>**Section 05 Electrical** | **Section 5.2.9 Trainlines (Reference Tables T 05-1 and T 05-2), paragraphs 1 through 9, shall now read:**<br><br>**5.2.9 Trainlines (Reference Tables T 05-1 and T 05-2)**<br><br>**A. <u>Locomotive Control.</u>** The two (2) BLACK MU Control receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle |

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| | **Continued from previous page.** | assemblies shall be Clement National CRA-27180-MU-BK **or approved equal**. Receptacle covers shall be marked with 1 inch white stencil lettering, "MU". New OEM wire markers shall be applied when the MU trainlines wires are re-terminated in the trainline junction boxes<br>The two (2) YELLOW MU DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-MU-Y **or approved equal**. Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY"<br>One (1) new BLACK MU trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-MU-BK **or approved equal.**<br>**B. <u>Door and Communication.</u>** The two (2) BLUE COMM receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle assemblies shall be Clement National CRA-27180-AMTK **or approved equal.** Receptacle covers shall be marked with 1 inch white stencil lettering, "COMM". New OEM wire markers shall be applied when the COMM trainlines wires are re-terminated with OEM terminals in the trainline junction boxes.<br>The two (2) WHITE COMM DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-AMTK-W **or approved equal.** Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY".<br>One (1) new BLUE COMM trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-AMTK **or approved equal.**<br>**C. <u>Head End Power.</u>** The four (4) fixed Head End Power (HEP) single ended trainline jumpers shall be renewed. The HEP jumper assemblies shall be Clement National MPA-1SR-0128 **or approved equal** and shall be colored RED.<br>The four (4) HEP receptacle housings shall be inspected, cleaned and repaired as needed. The HEP receptacles are the locking type, Clement National MRA-BH **or approved equal** and shall be colored RED.<br>The four (4) HEP receptacle assembly inserts shall be renewed. The HEP receptacle inserts shall be Clement National MRA-1-0077 **or approved equal** and shall be colored RED. |

# Addendum No. 4

## Attachment A - Responses to Planholder's Written Questions

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 4 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 17 | **Coaches Transportation** | | Since these cars will be moved via freight, the cars have to be registered in UMLER and must have AEI tags on the cars.<br>Are the MARC III cars registered in UMLER and do they have the AEI tags on? | Yes to both. |
| 18 | **Multiple Places** | | A number of specification sections require certain items to be overhauled according to OEM specifications. Is the Administration able to provide the latest car builder OEM specifications for the overhaul of items on the carbody section and the truck that have been provided by the car builder directly? | MTA has provided all available information. |
| 19 | **Section I Solicitation Information and Instructions** | **Item A.1 Schedule of Activities** | *CONTRACT DOCUMENT REQUIREMENT: Closing Date for Receipt of Proposals (2:00 p.m.) June 28, 2013.*<br><br>BIDDER'S REQUEST: Bidder respectfully requests an extension to the specified due date of ninety (90) days. We require this additional time to ensure a full comprehensive proposal is prepared, reviewed, and addresses all of the specified requirements set out by the MTA's RFP. Also the extension to the bid due date will provide the Bidder an opportunity to conclude detailed commercial and technical negotiations with its selected Subcontractors so as to ensure the Bidder is able to offer the MTA its most competitive bid. | See Addendum 3. |
| 20 | **Section I Solicitation Information and Instructions** | **Item A.1 Schedule of Activities** | *CONTRACT DOCUMENT REQUIREMENT:* Proposal Inquiry Deadline May 13, 2013 May 31, 2013<br><br>BIDDER'S REQUEST: The Bidder respectfully requests an extension to the specified Proposal Inquiry Deadline of ten (10) days. The extension to the proposal inquiry deadline will provide the Bidder the opportunity to address technical clarification needed with its selected Subcontractors so as to ensure the Bidder is able to offer the MTA its most competitive bid. | No Change. |
| 21 | **Section I Solicitation Information and Instructions** | **Item B.6 Closing Date** | After the visit held in Baltimore on May 21st and during the analysis of the RFP, a lot of questions have been raised. In order to prepare a comprehensive proposal we need 4 weeks from the day we'll receive your answers.<br>Could the Authority reconsider a new tender due day based on 4 weeks after all answers will be issued? | See Addendum 3. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 22 | **Section III Sample Contract Agreement**<br><br>**Section IV Proposal Exhibits** | **Exhibit L Experience and Reference** | Does the Exhibit L have to be included in Exhibit C under Section III. | Yes. |
| 24 | **Section IV Proposal Exhibits**<br><br>**Exhibit Z General Provisions for Purchase Contracts** | **Item 29.C GP Page 10 of 23** | Document states *"…the contractor shall promptly commence corrective work upon receipt of written notice from the MTA".*<br><br>Does this imply that we will be able to work on warranty related repairs without labor issues or charges from the MTA? | Please refer to Section F.4 Warranty of Work. |
| 25 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.4.1 MARC III Coaches Out of Service** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor shall be limited to a not-to-exceed of six MARC III coaches removed from MARC possession at any one time during the Contract; and the Contractor shall plan work according to this restriction.<br><br>BIDDER'S REQUEST: Please clarify if the cars outbound from MARC and Inbound to MARC for Acceptance Testing are considered in MARC's possession. | Cars are considered to be in the Contractor's possession from after the outbound inspection until conditional acceptance. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 26 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item 4.4.1 MARC III Coaches Out of Service** | *"The Contractor shall be limited to a not-to-exceed of six MARC III coaches removed from MARC possession at any one time during the Contract; and the Contractor shall plan work according to this restriction. The not-to-exceed limit of two MARC III coaches includes MARC III coaches that are not available for revenue service due to Contractor activities such as acceptance testing and equipment retrofits. The MTA shall not allow more than two overhauled MARC III coaches to remain unaccepted on MTA property"*<br><br>Beyond the 6 cars already out of service for the overhaul activities, could the Authority confirm that no more than 2 others unaccepted cars are allowed? This means that the Authority could have in the worst case 8 cars out of service. Is it correct? | See Addendum 4 Item 1. |
| 27 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.4.1 MARC III Coaches Out of Service** | *CONTRACT DOCUMENT REQUIREMENT:* The not-to-exceed limit of two MARC III coaches includes MARC III coaches that are not available for<br>revenue service due to Contractor activities such as acceptance testing and equipment retrofits.<br><br>BIDDER'S REQUEST: Please clarify if the not-to exceed limit of two MARC III Coaches are in addition to the six coaches removed from MARC possession. This meaning that there are up to eight (8) MARC III cars in the process of overhaul and being tested. This is required to meet the requested schedule. | See Addendum 4 Item 1. |
| 28 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.5 Completion of Work Schedule** | The addendum #2 changed the delivery for the first 3 cars to NTP + 365.<br>With this new schedule and to be consistent with 6 coaches out of service, could we consider that the complete fleet will be completed 3 months later? This means NTP + 1010 days.<br>If not, would the Authority consider increasing the car float from 6 cars to 10 cars? | Please see Special Provisions, Section C.5.1 A, B for proposing alternate car float scenarios. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 29 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.5 Completion of Work Schedule** | The suppliers for the major subsystems such as Brake, HVAC, and Communication propose a lead time for the first 3 cars beyond 12 months. Considering that the contractor needs an average of 3-4 weeks to formalize the notice to proceed to the supplier and minimum 2 months to assemble the last overhauled components and to test them, the best delivery time for the first 3 cars can be NTP + 15 Months.<br>Could the Authority confirm that a project schedule for the first 3 cars in NTP + 15 Months is acceptable?<br>If it is the case, could the authority explain how it would manage the rest of the project schedule?<br>Can the offeror consider an extension of the same number of months added for the first 3 cars or consider an increase of the car float? | Please see Special Provisions, Section C.5.1 A, B for proposing alternate car float scenarios. |
| 30 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.5 Completion of Work Schedule and Addendum 2** | As a result of the first delivery dates being changed in Addendum #2, from NTP +270 to NTP +365 days, this make the delivery of the 63rd car by NTP+920 days nearly impossible with the amount of float cars provided. In order for the MTA to minimize risk related to late delivery, could the MTA please extend the delivery of the 63rd car from NTP +920 to NTP +1060? | Please see Special Provisions, Section C.5.1 A, B for proposing alternate car float scenarios. |
| 31 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.4.5 Completion of Work Schedule**<br><br>**Addendum 2** | Can the MTA please extend the first delivery of car from NTP +365 to NTP +488? This change is needed as many of the major suppliers of new/upgraded components cannot produce their equipment to meet the current schedule. The requirement to have 3 full carsets of new/upgrade components at the current schedule is even more challenging for the suppliers. | No Change. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 32 | **Section V Special Provisions**<br><br>**Section A Summary of Work**<br><br>**Section VI Technical Specifications**<br><br>**Section 17 Management and Support Systems** | **Item A.4.5 Completion of Work Schedule**<br><br>**Item 17.10 Manuals** | *CONTRACT DOCUMENT REQUIREMENT: A-4.5 Completion of Work Schedule*<br>*3. Deliver Third (3rd) Overhauled Vehicle – Trailer w/Toilet NTP + 270 days*<br>*5. Deliver Draft Revision of Manuals for Training Purposes NTP + 240 days*<br>*6. Complete Training = NTP + 260 days*<br>*7. Deliver Diagnostic and Test Equipment and Special Tools NTP + 465 days*<br>*17.10 MANUALS*<br>*Paragraph 5; Draft change pages shall be supplied prior to delivery of the third vehicle. (CDRL 1720) Change page quality shall be equivalent to the OEM paper quality and shall be appropriately sized for the manuals in which they will be inserted.*<br><br>BIDDER'S REQUEST: 1)The schedule is not realistic: Training is required to be completed prior to the delivery of the 3rd unit, In our experience you need to have the cars to provide training. As cars are delivered they will undergo testing, prior to their availability for Training.<br>2) In our experience DTE and Special tools are needed in order to do the training<br>3) Delivery of Draft pages at NTP+240 VS TS requirement;17.10<br>a) Manual material is needed prior to developing Training Material.<br>b) in our experience in cases of Overhaul, there are still fittings and modifications carried out during the testing phase. Draft pages should be submitted after this phase. We request the schedule be changed to reflect the above noted conditions<br>1) line 6; completion of training to be aligned with Special Tools, at NTP + 465 days<br>2) line 5, Draft revision of Manuals for training purposes =NTP+330<br>3) TS 17.10 Paragraph 5; Draft revision of change pages starting at NTP+330 | No Change. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 33 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item 5.1 MTA/MARC Facilities** | *E. Access on mainline track for acceptance testing during limited day time/night time and weekend hours.*<br><br>As the amount of available time is a critical path activity for the schedule, please could more information be provided on the most likely availability hours for testing? | For bidding purposes the contractor shall estimate 8 hours per weekend. |
| 34 | **Section V Special Provisions**<br><br>**Section A Summary of Work** | **Item A.5.1 MTA/MARC Facilities** | *CONTRACT DOCUMENT REQUIREMENT:*<br>*"Space for one (1) trailer, which shall be provided by the Contractor…"*<br><br>BIDDER'S REQUEST: Is there a size limit on the trailer? Will space be provided for storage of warranty spare material? Will there be space for suppliers to add more trailers if necessary? Does this include parking, and if so, for how many vehicles? | Allowance is made for 1 standard temporary office delivered by a single tractor trailer. Space will be provided for warranty spare material. Parking is available for up to three vehicles at the Martins Facility. |
| 35 | **Section V Special Provisions**<br><br>**Section C Proposal Format, Organization, and Content** | **Item C.5.1 Price Proposal- General** | The Base Scope of Work includes the provision of six float cars. As per section C-5.1 of the Special Provisions, the MTA wishes to have the narratives detailing the cost and schedule economies for seven and eight float cars. Would it be acceptable for the MTA if the Contractor uses a quantity of seven or eight float cars for the Base Scope of Work and provide narratives detailing the cost and schedule impact for the two other options? | Please see Special Provisions, Section C.5.1 A, B for proposing alternate car float scenarios. |
| 36 | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Item F.4.2 Warranty Period – Specific Subsystems** | *CONTRACT DOCUMENT REQUIREMENTS: "…the Contractor warrants that the items listed in section F.4.2.1 shall…."*<br><br>BIDDER'S REQUEST: There is no section F.4.2.1. Please clarify. | See Addendum 4 Item 2. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 37 | **Section V Special Provisions**<br><br>**Section F Legal Requirements** | **Item F.4.3 High Failure Rate** | "In addition to the above warranty, if any single failure mode on a single component of any new, upgraded, or overhauled subsystem develops and the number of such failures reaches 10 percent of the population of an item in any single year during the warranty period"<br><br>Since the contractor doesn't know the failures of the current subsystems, we request to modify the above language as indicated below:<br><br>"In addition to the above warranty, if any single failure mode on a single component of any new subsystem develops and the number of such failures reaches 10 percent of the population of an item in any single year during the warranty period"<br><br>If the Authority will not accept the above condition then will it accept that the reliability for the overhaul components exist only for the new parts applied to that overhaul unit and any failures related to parts that are not replaced as part of the overhaul will NOT be considered in the reliability figures? | No Change. |
| 38 | **Section VI Technical Specifications**<br><br>**Section 00 System Requirements** | **Item 0.2 Physical Characteristics** | *CONTRACT DOCUMENT REQUIREMENT:* Car Numbers: Car numbers, classes, and quantities shall be as follows and shall remain with original car:<br><br>VRE Acquired Cars:<br>・Trailers Car Nos. 7826 through 7834, Qty. 9<br>・Cab Car Nos. 7855 through 7858, Qty. 4<br><br>BIDDER'S REQUEST: VRE cars are different from MARCIII cars in some systems, such as the powered trap door, alerter etc.<br>For the powered trap door system, VRE cars have. However, the TS does not describe these parts. Does the Administration permit these systems to remain as is if these parts have not been removed by the<br>Administration? | For all MARC owned VRE style cars the trap door actuators, relay panels, switch panels, sensors, and related wiring have already been removed by the MTA. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 39 | **Section VI Technical Specifications**<br><br>**Section 00 System Requirements** | **Item 0.3 Design Considerations** | *CONTRACT DOCUMENT REQUIREMENT:* Under the most restrictive combination of track conditions, curves, switches, etc., the clearance between adjacent coupled cars (except at the buffers, diaphragms, and couplers) is a minimum of 3 inches under maximum buff conditions. Car end angles are designed to provide this clearance.<br><br>BIDDER'S REQUEST: TS requires the compatibility with the Administration's existing fleet.<br>Please clarify if this requirement is to be applied for the clearance between MARC III and existing fleet, such as MARC IV. If so, information for the existing fleet is necessary. | The current car configuration is compatible with the entire fleet. |
| 40 | **Section VI Technical Specifications**<br><br>**Section 00 System Requirements** | **Item 0.6 Flammability, Smoke Emission, and Toxicity** | *CONTRACT DOCUMENT REQUIREMENT:* Compliance shall be demonstrated for all new equipment and upgraded components by meeting the applicable U.S. standards and tests and the requirements of 49CFR238.103, as specified in TS Section 18.2.<br><br>BIDDER'S REQUEST: Do we need to submit the test results even though the OEM for the truck rubber parts uses the same material? | Please see TS Section 18.12.1, first sentence. |
| 41 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2 Overhaul Requirements** | *CONTRACT DOCUMENT REQUIREMENT:* The carbody shall be cleaned, inspected, and overhauled to repair all damaged or defective areas of the structure and car shell.<br><br>BIDDER'S REQUEST: Please confirm that there are no damaged cars such as collision-damaged cars or fire-damaged cars. | MTA does not have any collision or fire damaged cars MARC III cars. |
| 42 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2 Overhaul Requirements** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor shall bid on repairing a minimum of twenty (20), 12-inch by 24-inch carbody exterior areas.<br><br>BIDDER'S REQUEST: Please clarify how compensation will be made for the extra work if the actual damaged areas exceed the bid quantities. | Please see section in Special Provisions C.5.3 |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 43 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2 Overhaul Requirements** | *CONTRACT DOCUMENT REQUIREMENT:* New apparatus, such as material or configuration changes, supplied during the overhaul shall be the same for all vehicles and shall be fully interchangeable.<br><br>BIDDER'S REQUEST: Please clarify if this requirement should be applied for all the overhauled cars including VRE cars.<br>It may not be possible because some of the designs for the VRE cars are different from the MARCIII. | MTA expects the same level of interchangeability with the overhauled MARC III cars as with the existing fleet. |
| 44 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2 Overhaul Requirements** | CONTRACT DOCUMENT REQUIREMENT: The Contractor shall bid on repairing a minimum of twenty (20), 12-inch by 24-inch carbody exterior areas.<br><br>BIDDER'S REQUEST: Please clarify whether this means 20 repairs for one car, or 20 repairs for 63 cars. | 20 repairs for 63 cars. |
| 45 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.2 Overhaul Requirements Underframe** | *CONTRACT DOCUMENT REQUIREMENT: The Contractor shall clean, repair, and overhaul all exposed areas of the underframe, including the end and center sections, draft gear, coupler pockets, and the areas around the truck bays.*<br><br>BIDDER'S REQUEST: Please clarify what level of cleaning required. | The level of cleaning shall permit the proper subsequent weld inspection. |
| 46 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.3 Overhaul Requirements Weld Inspection Plan** | Does the weld inspection plan require that all paint be removed for inspection of welds? | Yes. |
| 47 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.3 Overhaul Requirements Weld Inspection Plan** | *CONTRACT DOCUMENT REQUIREMENT: Remove all covers of the undercar 480 VAC duct bank and wiring and ducts. Inspect and clean all cleat*<br>*block connections, cable connections, and separators. Recondition duct bank covers and reinstall.*<br><br>BIDDER'S REQUEST: Please define recondition? | See Addendum 4 Item 3. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 48 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.3 Weld Inspection Plan** | *CONTRACT DOCUMENT REQUIREMENT:* End underframes are to be overhauled, primed and then given 3 coats of black enamel after inspection and repairs.<br><br>BIDDER'S REQUEST: Please confirm that this requirement is applicable only for the visible portions of the end underframes. | Confirmed. |
| 49 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.3 Weld Inspection Plan** | *CONTRACT DOCUMENT REQUIREMENT:* Replace any damaged car body thermal insulation with same density aluminum faced insulation, or<br>Administration approved equal.<br><br>BIDDER'S REQUEST: Please confirm the inspection of damaged car body thermal insulation shall be done without removing interior panels or floor panels. | Confirmed. |
| 50 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.4 Bolster Anchor Brackets** | *CONTRACT DOCUMENT REQUIREMENT:* Existing bolster anchor brackets and fasteners shall be cleaned, visually inspected, overhauled, and<br>painted.<br><br>BIDDER'S REQUEST: Please clarify if sand blasting is required or a cleaning with top coat was the intent. | Cleaning with top-coat is required. |
| 51 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.7 Overhaul Requirements Roof** | *CONTRACT DOCUMENT REQUIREMENT: All roof levels shall be cleaned, water tested, and inspected. Any damaged side and top roof sheets shall be repaired.*<br><br>BIDDER'S REQUEST: What is the specification for water test? | Please see TS section 14.4.3 Item O. |
| 52 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.7 Roof** | *CONTRACT DOCUMENT REQUIREMENT:* Water leak areas shall be repaired using a cover plate of matching sheet configuration.<br><br>BIDDER'S REQUEST: Please clarify that methods other than welding are acceptable for attaching the cover plate, such as mechanical fasteners (bolts, rivets, etc.) or adhesives. | Repair procedures shall be approved by the MTA. |

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| 53 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.8 Windows** | Per the drawings, the passenger side windows on the MTA fleet differ from those on the VRE cars (no center divider, for example), yet during the site visit it was noticed the VRE windows appear to have the divider.<br>Is this the case for all VRE cars, or were some cars converted at some point?<br>Should all cars match with identical frames, glazing and gaskets? | See Addendum 4 Item 4. |
| 54 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody and Section 13 Cab Equipment** | **Items 1.2.8 Windows & 13.2.6 Windshields** | Can the MTA confirm the work scope for the windshields and cab windows? There is a contradiction between TS 1.2.8 which calls for the glazing to be reused and TS 13.2.6 which calls for them to be renewed. | See Addendum 4 Item 4. |
| 55 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.9 End Vestibule** | *CONTRACT DOCUMENT REQUIREMENT:* Vestibule floors shall be thoroughly cleaned, inspected, and overhauled to restore original functionality and appearance.<br><br>BIDDER'S REQUEST: Please confirm that the cleaning, inspection and overhaul of the vestibule floors is only to be done for the visible portions without removing the floors. | Confirmed. |
| 56 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.10 Stepwells and Trapdoors** | *CONTRACT DOCUMENT REQUIREMENT:* As an option, the Contractor shall propose a replacement stepwell surface as an improvement to the OEM design.<br><br>BIDDER'S REQUEST: Please clarify what function of the stepwell surface to be improved. | The step tread surface. |
| 57 | **Section VI Technical Specifications**<br><br>**Section 01 Carbody** | **Item 1.2.11 Safety Appliances and Handholds** | *CONTRACT DOCUMENT REQUIREMENT:* Inspect and overhaul all interior and exterior stair handholds and verify that all safety appliances meet all current FRA Safety Appliances regulations.<br><br>BIDDER'S REQUEST: Please confirm the inspection and overhaul of handholds is to be done without removing the handholds. | Confirmed. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 58 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.2 Overhaul Requirements and 2.5 Spare Trucks** | Addendum #2 eliminated the requirement to replace all missing parts on the spare truck assemblies in § 2.8. Can this be extended to eliminate the requirement to replace all missing parts on the other assemblies in § 2.2 as well? If not, can the MTA please provide details as to the missing parts on the other truck assemblies? | No. |
| 59 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Frame** | *CONTRACT DOCUMENT REQUIRMENT:* Damaged or missing number plates shall be replaced.<br><br>BIDDER'S REQUEST: What is your expected number for replacement? | The information is not available. |
| 60 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Frame** | *CONTRACT DOCUMENT REQUIREMENT:* Spring pockets or spring suspension counter bores and mounting holes requiring repair shall be built up with weld. Reamed holes and seats shall be restored.<br><br>BIDDER'S REQUEST: What is your expected number of trucks that are over the criteria?<br>Please provide the latest inspection results for our cost estimation. | The information is not available. |
| 61 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Frame** | *CONTRACT DOCUMENT REQUIREMENT:* Frames shall be trimmed for proper alignment. Proper alignment is defined as the difference in diagonal<br>measurements being less than 1/16 inch. Tram points shall be permanently identifiable.<br>Incorrect tram shall be corrected using industry accepted methods. Tram procedure(s) shall be submitted to the Administration for review and approval before any actual work.<br><br>BIDDER'S REQUEST: What is your expected number of trucks that are over the criteria?<br>Please provide the latest inspection results for our cost estimation. | The information is not available. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 62 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Scope of Work Frame** | *CONTRACT DOCUMENT REQUIREMENT: Frames shall be abrasive blasted clean to bare metal, removing all corrosion, and then visually inspected for damage.*<br><br>BIDDER'S REQUEST: Do all frames need to be sand blasted and painted or only the stress areas? | The entire frame shall be abrasive blasted cleaned to bare metal, removing all corrosion. |
| 63 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Frame** | *CONTRACT DOCUMENT REQUIREMENT:* B. Radius Arm Caution Plate. Four red "radius arm torque value" caution plates shall be applied to each truck after all painting on the truck is completed. The location of the Caution Plate shall be in accordance with OEM.<br><br>BIDDER'S REQUEST: Please clarify whether the caution plates are to be new or repaired one. | The four red "radius arm torque value" caution plates shall be renewed. |
| 64 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.1 Frame** | *CONTRACT DOCUMENT REQUIREMENT:* Side bearing friction plates shall be conditioned for coefficient of friction as specified by OEM using OEM recommended equipment.<br><br>BIDDER'S REQUEST: Do you carry out the conditioning for coefficient of friction by OEM using OEM recommended equipment? | No change. |
| 65 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.2 Scope of Work Bolster** | *CONTRACT DOCUMENT REQUIREMENT: Existing body side bearing plates may be remachined flat removing a maximum of 0.125 inches of the original plate thickness. The stainless wear plates shall be re-welded to AWS procedures and sealed per OEM instructions.*<br><br>BIDDER'S REQUEST: Is the existing body side bearing plates the same as the sliding wear plates? | Please refer to Chapter 2.1, Pages 30- 33 of the Illustrated Parts Catalogue showing the Side Bearing Assembly. |
| 66 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.2 Bolster** | *CONTRACT DOCUMENT REQUIREMENT:* Existing body side bearing plates may be re-machined flat removing a maximum of 0.125 inches of the<br>original plate thickness. The stainless wear plates shall be re-welded to AWS procedures and sealed per OEM instructions.<br><br>BIDDER'S REQUEST: Is this body side bearing plate steel plate welded under the bolster?<br>Is this stainless wear plate welded under the body side bearing? | Please see the documentation provided on the DVD referenced in Addendum 1 Item 2. |

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| 67 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.2 Bolster** | This section requires welds to be of an "acceptable quality" after magnetic particle inspection or to be repaired. Does this requirement only have to be applied to new welds or does it include OEM welds as well? Does this include non-structural defects such as overlap and undercut in the OEM welds?" | Please see Sections 15.1, 15.17.1 and 15.17.8. |
| 68 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.3 Bolster Anchor Rods** | *CONTRACT DOCUMENT REQUIREMENT:* All bolster anchor rod rubbers are to be replaced if found worn, or damaged.<br><br>BIDDER'S REQUEST: What is your expected number for replacement?<br>Without any inspection data, we cannot estimate the cost. Please clarify. | For bidding purposes the Contractor shall plan on replacing all bolster anchor rod rubbers. |
| 69 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.4 Radius Arms** | *CONTRACT DOCUMENT REQUIREMENTS:* Radius arm rubbers shall be replaced if found worn, or damaged. Existing roller bearing seats of the radius arms shall be cleaned, inspected, and overhauled in accordance with the OEM recommendations or shall be renewed.<br><br>BIDDER'S REQUEST: What is your expected number for replacement?<br>Without any inspection data, we cannot estimate the cost. Please clarify. | See Addendum 4 Item 5. |
| 70 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.7 Suspension** | *CONTRACT DOCUMENT REQUIREMENT:* Existing air springs shall be inspected for damage and replaced in accordance with OEM procedures and criteria.<br><br>BIDDER'S REQUEST: What is your expected number for replacement? Without any inspection data, we cannot estimate the cost. Please clarify. | Please see TS 2.4.7 Item B, 1. |

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| 71 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.8 Scope of Work Electrical, Electrical Conduit, and Piping** | Section 2.4.8 mentions a new magnetic wheel slide speed sensor cable assembly is to be installed. Will the magnetic wheel slide speed sensor cable assemblies be a new design, or will we be replacing an existing system? If this is a new design, can the Administration provide any required information on specifications and interfaces needed to properly design the assembly? If this is not intended to be a new design, can the Administration verify the intended replacement is consistent with the information in the IPC? | See Addendum 4 Item 6. |
| 72 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.8 Scope of Work Electrical, Electrical Conduit, and Piping** | Section 2.4.8 mentions a new event recorder/alerter and automatic announcement system speed sensor is to be installed. Will the event recorder/alerter and automatic announcement system speed sensor be a new design, or will we be replacing an existing system? If this is a new design, can the Administration provide any required information on specifications and interfaces needed to properly design the assembly? If this is not intended to be a new design, can the Administration verify the intended replacement is consistent with the information in the IPC? | See Addendum 4 Item 6. |
| 73 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.8 Scope of Work Electrical, Electrical Conduit, and Piping** | Can the Administration verify who is expected to provide and install the new axle generator? | See Addendum 4 Item 6. |
| 74 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.8 Electrical, Electrical Conduit, and Piping** | *CONTRACT DOCUMENT REQUIREMENT:* A. Electrical Conduit. Existing conduits, junction boxes and fittings shall be removed and inspected. Any damaged parts shall be replaced with new OEM material. Terminals, cables, and connectors shall be cleaned and inspected.<br>Any damaged parts shall be replaced with new OEM material.<br><br>BIDDER'S REQUEST: What is your expected number for replacement? Without any inspection data, we cannot estimate the cost. Please clarify. | For bidding purposes the Contractor shall estimate 5% replacement. |

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| 75 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.4.10 Electrical Grounding** | *CONTRACT DOCUMENT REQUIREMENT:* Axle end grounding contacts shall be overhauled or replaced.<br><br>BIDDER'S REQUEST: What is your expected number for replacement?<br>Without any inspection data, we cannot estimate the cost. Please clarify. | See Addendum 4 Item 7. |
| 76 | **Section VI Technical Specifications**<br><br>**Section 02 Trucks and Suspension** | **Item 2.5 Spare Trucks** | During the Car Inspection on May 20, 2013, we were able to inspect the 8 spare trucks that are required to be overhauled. These trucks were stripped down with many components missing. Can the MTA please confirm the condition of each and every truck to be overhauled by the Contractor? Could the MTA confirm if it will be providing any of the other components that should be on the trucks that will require overhaul (i.e. Wheel and Axle Assembly, brake components)? | See Addendum 2 Item 9. |
| 77 | **Section VI Technical Specifications**<br><br>**Section 03 Couplers and Draft Gear** | **Item 3.2 Overhaul Requirements** | *CONTRACT DOCUMENT REQUIREMENT:* If the coupler assemblies are deemed not repairable, they will be renewed.<br><br>BIDDER'S REQUEST: Please kindly provide the Administration's estimated quantity of the renewed coupler assemblies and its latest inspection information. | The MTA does not anticipate any coupler replacement |
| 78 | **Section V1 Technical Specifications**<br><br>**Section 03 Couplers and Draft Gear** | **Item 3.2.2 New Couplers** | "New Couplers, where required, shall be fully interchangeable with those installed on the<br>Administration existing coaches."<br><br>If the coupler has to be changed, could the contractor consider this activity as variation order? If not, could the Authority define how many new couplers must be included in the proposal? | The MTA does not anticipate any coupler replacement |

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| 79 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4 Scope of Work, Item C.** | The brake supplier can perform basic leakage testing on the laminated brake pipe manifolds. However, laminates (studded) are not normally tested separately from the piping arrangement. The brake supplier notes that testing of the pipe brackets may increase the cycle time, depending upon the test procedure required. Are Contractors required to perform basic leakage testing on the laminated brake pipe manifolds? | Yes. |
| 80 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4 Scope of Work Item 5 Sanding System Removal** | In Technical Spec section 4.4.Q, the sanding control valves and the sanding nozzles are to be overhauled, but in section 4.5 the sand boxes, sanding magnet valves, sand traps, sanding nozzles and hoses are to be removed. Please confirm. | See Addendum 4 Item 8. |
| 81 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4.1 WABCO E-7 Decelostat** | *CONTRACT DOCUMENT REQUIREMENT:* The existing WABCO E-7 DECELOSTAT, wheel slip-slide detection and correction controller located in the Electric Locker shall be replaced with a KNORR MGS2 system or Administration approved equivalent.<br><br>BIDDER'S REQUEST: Has KNORR MGS2 system been tested and evaluated on MARC III cars? | No. |
| 82 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4.3 Truck Mounted Brake Units** | *CONTRACT DOCUMENT REQUIREMENT:* Tread brake units shall be overhauled per OEM specifications. Mechanical linkages shall be evaluated for wear and renewed per OEM specifications. Disc brake calipers units shall be overhauled per OEM specifications. Mechanical linkages shall be overhauled per OEM specifications.<br><br>BIDDER'S REQUEST: What is your expected number of **m**echanical linkages for replacement?<br>Without any inspection data, we cannot estimate the cost. Please clarify. | See Addendum 4 Item 9. |

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| 83 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4.3 Truck Mounted Brake Units** | "Disc brake friction rings shall be replaced with OEM friction rings or Administration approved equivalent.<br>Friction ring mounting hubs shall be visually inspected for cracks or other damage and shall be replaced if found to be damaged."<br><br>Will MTA accept 1-52182 as a replacement disc per the OEM? This is a monoblock rotor used on several AMTRAK car types (including Bi-Level Superliners) and currently in limited service on MARC cars. Alternate configurations can be quoted if necessary. | No. |
| 84 | **Section VI Technical Specifications**<br><br>**Section 04 Air Brake** | **Item 4.4.5 Handbrake** | *CONTRACT DOCUMENT REQUIREMENT:* All linkages, bushings, and pins shall be evaluated for wear, renewed or replaced.<br><br>BIDDER'S REQUEST: What is your expected number for replacement?<br>Without any inspection data, we cannot estimate the cost. Please clarify. | See Addendum 4 Item 10. |
| 85 | **Section VI Technical Specifications**<br><br>**Section 05 Electrical** | **Item 5.2.4 74 VDC Low Voltage System** | The specifications state that batteries 2 years or older are to be replaced, tested if less than that.<br><br>How many batteries are actually going to be less than 2 years old when the contract is awarded? | Please see Section 5.2.4 subsection A Paragraph 2. |
| 86 | **Section VI Technical Specifications**<br><br>**Section 05 Electrical** | **Item 5.2.4 74 VDC Low Voltage System** | Chapter 5.4 of the Maintenance Manual indicates that 80 Ah batteries are used in the Trailer Cars and 100 Ah batteries are used in the Cab Cars.<br><br>At the vehicle inspection session on May 21st, 2013, MTA personnel believed that the 100 Ah batteries were being used on both.<br><br>Please clarify which Ah battery is to be used when replacing those of the Trailer Cars. | Please follow OEM specifications. |

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| 87 | **Section VI Technical Specifications**<br><br>**Section 05 Electrical**<br><br>**Section 10 HVAC Unit and Controls** | **Item 5.2.5 Overhaul Requirements Relays, Contactors, and other Components**<br><br>**Item 10.3.6 Scope of Work Overhead Heater** | TS 5.2.5 requires the overhead heating elements to be cleaned, inspected, and tested, but TS 10.3.6 requires them to be renewed. Could the Administration please verify which is correct? | See Addendum 4 Item 11. |
| 88 | **Section VI Technical Specifications**<br><br>**Section 06 Interior Furnishings** | **Item 6.2 Overhaul Requirements** | "The vehicle interior may have been modified by running repairs during the service life of the vehicles and it is the Contractor's responsibility to obtain the complete interior specification and overhaul requirements from the OEM."<br><br>Due to the fact the proposers have only seen a few cars, could the Authority provide the proposers with the new specifications or with the description of the running modifications? | All information has been provided. |
| 89 | **Section VI Technical Specifications**<br><br>**Section 06 Interior Furnishings** | **Item 6.2.1 Materials** | This section includes the requirement, "All materials that are overhauled, replaced, repaired, or renewed shall conform to the smoke and flammability requirements of 49 CFR PART 238."<br><br>Could the Administration confirm that the current equipment meet CFR 238 requirements? | Please see TS Section 18.12.1, first sentence. |
| 90 | **Section VI Technical Specifications**<br><br>**Section 06 Interior Furnishings** | **Item 6.2.8 Floor Covering** | "Floor coverings in the upper and lower passenger levels shall be fully cleaned and overhauled to its original appearance"<br><br>Does a criterion exist to evaluate the clean level expected by the Authority? | This will be discussed during design review. |

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| 91 | **Section VI Technical Specifications**<br><br>**Section 06 Interior Furnishings** | **Item 6.2.8 Floor Covering** | This type of flooring product can only be repaired through replacement of a section. Is it the Authorities intent that repairs be made through replacement and if so what % of repair does the Authority expect? | Please see TS Section 6.2.8, 4th paragraph. The MTA does not anticipate any repair to the flooring material. |
| 92 | **Section VI Technical Specifications**<br><br>**Section 06 Interior Furnishings** | **Item 6.2.23 Seats** | Can you provide foam drawings for the armrest and seat and back? | All available drawings have been provided on the DVD referenced in Addendum 1 Item 2. |
| 93 | **Section VI Technical Specifications**<br><br>**Section 07 Toilet Room** | **Item 7.2 Overhaul Requirements** | "The Contractor shall ensure the Toilet Room meets the requirements of 36 PART 1192—Americans with Disabilities Act (ADA) Accessibility Guidelines For Transportation Vehicles, 49 CFR 37 - Transportation Services For Individuals With Disabilities (ADA), and 49 CFR 38 - Americans With Disabilities Act (ADA) Accessibility Specifications For Transportation Vehicles"<br><br>Can Authority confirm that the current Toilet meet the above requirement?<br>If not, can the Authority confirm that the contractor have to meet the above requirement only for the Option proposal and not for the basic proposal? | The Contractor shall supply a compliant toilet room that is new or overhauled. |
| 94 | **Section VI Technical Specifications**<br><br>**Section 07 Toilet Room** | **Item 7.2.2 Stainless Steel Mirror** | *CONTRACT DOCUMENT REQUIREMENT: T*he stainless steel mirror shall be cleaned and overhauled to its original finish. Any damaged mirrors shall be renewed. For estimating purposes, it is anticipated 10% of mirrors will be replaced.<br><br>BIDDER'S REQUEST: Please clarify what is the acceptance criteria for the stainless steel mirror after overhaul as the determination of mirror quality will be very subjective after overhaul. | No change. |

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| 95 | **Section VI Technical Specifications**<br><br>**Section 07 Toilet Room** | **Item 7.2.10** | *CONTRACT DOCUMENT REQUIREMENT: "Exhaust vents shall be removed and thoroughly cleaned and overhauled. The Contractor shall replace the motors and fans. The Contractor shall renew any component which cannot be overhauled. For estimating purposes, it is anticipated 5% of exhaust ventilator and ductwork will be replaced.*<br>*Refer to TS Section 10 for overhaul or ventilation ductwork."*<br><br>BIDDER'S REQUEST: We suggest that "replace the motors and fans" be replaced by "replace the motor and renew the Exhaust fan assembly".<br><br>We believe that the fan and fan housing should still be in good condition to be reused. We suggest removing the fan and housing in order to thoroughly clean and overhaul them. The fan and motor assembly would be retested and balanced as per OEM requirements before shipping. | No change. |
| 96 | **Section VI Technical Specifications**<br><br>**Section 07 Toilet Room** | **Item 7.2.11 Toilet Assembly** | "The Contractor shall ensure that the toilet operates in accordance with current Administration specifications."<br><br>Could the Authority provide the bidders with "Administration specifications"? | The Administration specifications match the OEM operational recommendations. |
| 97 | **Section VI Technical Specifications**<br><br>**Section 07 Toilet Room** | **Item 7.2.18 Door Hanger and Closure Assembly** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor shall clean and overhaul the door hanger and closure assembly in accordance with<br>OEM specifications. The Contractor shall ensure that the door slides easily in both directions over its full range of travel without binding or snagging. The maximum force required should be approximately 10 pounds-force. If defective, the mechanism shall be replaced with Remick Part No. RE 100276.<br><br>BIDDER'S REQUEST: According to our experience, the adjustment between the door closing with sagging and the door opening force are usually a trade off item. We suggest that the maximum force required should be approximately 15<br>pounds-force. | Overhaul per OEM requirements. |

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| 98 | **Section VI Technical Specifications**<br><br>**Section 08 Water and Waste Retention** | **Item 8.2 Overhaul Requirements** | Will the waste in the waste tanks be emptied by the Administration prior to shipping of the cars? Will any other waste cleaning be performed prior to shipment? | Waste tanks will be emptied prior to shipping of cars. No other cleaning shall be performed. |
| 99 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4 Side Doors**<br><br>**Item D. Gear Box** | Specification requires, "…assure that the gears rotate freely and mesh accurately without backlash."<br><br>This is incorrect because gears without backlash will bind. Gear backlash must be adjusted as defined in Chapter 9.4 of the Heavy Maintenance Manual. | See Addendum 4 Item 12. |
| 100 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4 Side Doors**<br><br>**Item D. Gear Box** | While Specification 9.3 requires, "All work shall be conducted in strict compliance with OEM requirements and recommendations," this OEM stresses that the gearbox requires special grease and overhaul procedures as per Chapter 9.4 of the Heavy Maintenance Manual and recommends HMM procedures be carefully followed. Also we recommend MTA require several quality upgrades for the gearbox over and above the overhaul procedures specified in the maintenance manual:<br>The Spirol pin connecting the Spiroid Gear to the output shaft should be replaced with OEM Pin 992966 and Retaining Ring 992966 to eliminate a potential failure mode. | Overhaul per OEM specifications. |

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| 104 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4 Side Doors**<br><br>**Item J. Emergency Door Release Assemblies** | Specification requires, "The Contractor shall inspect all Emergency Door Release Assemblies for function and ease of use. All cable assemblies shall be inspected. The Contractor shall test that all interior and exterior emergency releases operate in accordance with APTA Standard SS-C&S-012-02."<br>1 – The emergency releases were designed and manufactured in the mid 1990's before the referenced APTA SS-C&S-012-02 was released. APTA paragraph 6.2.1 requires, "The force necessary to actuate the interior emergency release mechanism shall not exceed 20 pounds" and, "The force necessary to actuate the exterior emergency release mechanism shall not exceed 30 pounds using a lever type mechanism or 50 pounds using a "T" handle type mechanism." The outside release uses a T-handle mechanism. Does MTA require the emergency release mechanisms to be re-designed if they do not comply with the subsequently issued APTA requirements? | See Addendum 4 Item 14. |
| 105 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4 Side Doors**<br><br>**Item M. Sensitive Edge Assembly and Switch** | Specification requires, "The Contractor shall renew the sensitive edge assembly and pressure wave switch with an OEM switch or Administration approved equal."<br><br>The existing sensitive edge switch (pressure wave switch) has been superseded by a similar pressure wave switch that is more resistant to dirt and contact contamination than the original. Please confirm the acceptance of an OEM-approved upgrade. | See Addendum 4 Item 15. |
| 106 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4 Side Doors**<br><br>**Item M. Sensitive Edge Assembly and Switch** | The original sensitive edge was designed per MTA-3-56-1 Paragraph 6.4. "Controls for the doors shall be arranged so that any obstruction larger than 0.5" x 4" (4" in the horizontal) can be sensed by the panel edge."<br><br>This was issued before APTA SS-C&S-012-02 was issued and the existing obstruction sensitivity may not meet the more restrictive sensitivity requirements defined in that specification. Although not cited specifically in the MTA specification, please confirm that MTA does not require the obstruction sensitivity for side doors to be redesigned to comply with APTA SS-C&S-012-02. | See Addendum 4 Item 15. |

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| 107 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4.P Crew Switch** | Specification 9.4.P requires, "The Contractor shall renew the interior and exterior crew switches. Their functionality shall be validated to OEM requirements. All exterior crew switch covers and gaskets shall be renewed."<br><br>The OEM supplied Outside Crew Switches for these cars but is unaware of any inside crew switches. Please advise if the cars have been retrofitted with inside crew switches. If not, please remove this requirement from the specification. | No Change. |
| 108 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.6 Vestibule Doors** | Specification requires, "The door hangers, upper guide, sills, lever, arms, and base shall be overhauled or renewed to restore original functionality. For estimating purposes, it is anticipated 20% of hangers, guides, and arms will be replaced."<br><br>The bidder would like to propose an alternate rail transit service proven roller-and-track style hanger design incorporating:<br>- Permanently sealed bearings surrounded by elastomer tires for quiet operation<br>- No maintenance<br>- Cams to facilitate door height and tilt adjustment on the car.<br>- Installs in the same space envelope as existing hanger<br>Please comment on the acceptability of an alternate door hanger design. | No change. |
| 109 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4.Q Outside Signal Lights** | Specification 9.4.Q requires, "The outside door indicator lights shall be replaced with LED indicators mounted in low profile housings. The indicators shall be visible in bright daylight from the end of an eight (8) car consist."<br><br>Since the existing outside indicator lights (both the red / blue at each side doorway and the white on the cab cars) operate within the dynamic car profile on the MTA system, please confirm the existing "low profile housings" are acceptable or otherwise define "low profile." Also, please confirm that MTA will accept re-using the existing outside signal light housings, understanding that the incandescent lamps need to be replaced with LEDs and the lenses and hardware renewed. | The housing may be reused. Details will be discussed during design review. |
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| 110 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.4.U Miscellaneous Equipment** | Specification 9.4.Q requires, "The Contractor shall perform functional checks on all miscellaneous door control system components and replace any broken, missing, or worn-out parts, and test them in accordance with OEM requirements."<br><br>The bidder notes that the panel sensing switch assemblies, a safety critical component of the door system (ref. safety analysis) have not been explicitly addressed in the overhaul specification and would, as a result, fall under this paragraph. The bidder recommends MTA to specifically address panel sensing switch overhaul to make sure the limit switch, bearings, spring and hardware to be renewed 100% and that the assembly be retested and adjusted as per OEM specifications. | Overhaul per OEM requirements. |
| 111 | **Section VI Technical Specifications**<br><br>**Section 09 Door and Door Control** | **Item 9.1 General System Description & Item 9.6 Vestibule Doors** | Specification 9.1 requires, "The vestibule doors are electrically powered by an overhead door operator and will have a proposed alternate design using linear synchronous motor technology or permanent magnet type synchronous motor technology and microprocessor control." Similarly, Specification 9.6 requires, "The Contractor shall propose an alternate design to the existing electrically operated overhead door operator and touch switch. [CDRL 904] The alternate design shall utilize linear synchronous motor technology or permanent magnet type synchronous motor technology and microprocessor control. "<br><br>1 – The bidder intends to quote an alternate design that uses pulse width modulation (PWM) to control the door operator motor instead of frequency controls associated with synchronous motors. This has been demonstrated to the MTA prior to the issuance of this specification and the bidder understood this to be an acceptable approach by MTA. PWM controls are a more efficient way to provide the required door motion profile and obstruction features. Please remove the word "synchronous" for the alternate design in both paragraphs. | See Addendum 4 Items 16 &17. |

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| 112 | **Section VI Technical Specification**<br><br>**Section 10 Heating, Ventilation, and Air Conditioning (HVAC) Unit and Controls** | **10.3.1 Temperature Controller** | **Section 10.3.1Temperature Controller, first sentence shall be modified to read:**<br>The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with **a Vapor Temperature Control Unit (part no. 2010400017) or an Administration approved equivalent** microprocessor controller compatible with the existing control voltages and control logic developed by the OEM.<br><br>The part number should read **201040017** instead of 2010400017. | See Addendum 4 Item 18. |
| 113 | **Section VI Technical Specifications**<br><br>**Section 10 HVAC** | **Item 10.3.1** | *CONTRACT DOCUMENT REQUIREMENT: **"Section 10.3.1 Temperature Controller, first sentence shall be modified to read:** The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with **a Vapor Temperature Control Unit (part no. 2010400017) or an Administration approved equivalent** microprocessor controller compatible with the existing control voltages and control logic developed by the OEM."*<br><br>BIDDER'S REQUEST: The part number should read 201040017 instead of 2010400017. | See Addendum 4 Item 18. |

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| 114<br><br>. | **Section VI Technical Specifications**<br><br>**Section 10 HVAC** | **Item 10.3.3 HVAC Unit** | *CONTRACT DOCUMENT REQUIREMENTS:* ***HVAC Unit Air Conditioning System. "****The existing air conditioning system is rated for operation on nominal 480 VAC, 3-phase 60 Hz power and 120 VAC supplied by the existing fleet of MARC locomotives. The existing HVAC units were originally manufactured by Stone Service Corporation. The existing system utilizes refrigerant R-22. The existing system shall be modified and designed for use with refrigerant R-407c."*<br>*"The scroll compressors shall be replaced with new scroll compressors that are sized for and compatible with the R-407c replacement refrigerant."*<br><br>BIDDER'S REQUEST: We request that "R-407c" be replaced by "R-407c or R410a".<br>R410a refrigerant compared to R-407c has the following advantages:<br>- The energy consumption is about 15% lower.<br>- The gliding temperature is lower.<br>- The cooling capacity of an R-410a unit is about 20% higher than an R-407c unit when operated in the same conditions.<br>- This upgrade has been developed by this OEM and currently in revenue service.<br>- There is less impact to the piping if upgrading to R-410a. If changing to R-407c, the size of the majority of valves has to be increased, and the evaporator inlet and outlet piping dimensions, nozzles size and circuits will need to be changed. | See Addendum 4 Item 19. |

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| 115 | **Section VI Technical Specifications**<br><br>**Section 10 HVAC** | **Item 10.3.11 Testing** | *CONTRACT DOCUMENT REQUIREMENT:* In addition to the testing requirements in TS Section 14, the Contractor shall submit an On-vehicle Climate Control Validation Test plan for approval. [CDRL 1003] In accordance with TS Section 14.3, the contractor shall submit for approval a design qualification test plan to validate that the microprocessor controller meets or exceeds the OEM interior climate control requirements and fault detection and logging requirements of this technical specification.<br><br>BIDDER'S REQUEST: The bidder considers that the "On-vehicle" Climate Control Validation Test" will not be needed because it can be verified by the HVAC system qualification test. The heat transfer of carbody will not vary after the overhaul because the material of the interior lining and thermal insulation will be designed to be the same as same as the original car. Also, the air distribution of the car will not change because the duct system and the blower motors for the HVAC are the same. The cooling capacity after replacing with R407C and additional required functions can all be verified by HVAC system qualification test. | No change to specification. |
| 116 | **Section VI Technical Specifications**<br><br>**Section 12 Communicatio ns** | **Item 12.1 General System Description** | ENSCO Wireless Modem and GPS: In order to allow the Contractor to evaluate the possibility of re-using the existing ENSCO wireless modem / GPS (RM-MU-4-R0DUAL), could the MTA provide a detailed technical description of the equipment, including the available interfaces (communication ports) that can be used? | See Addendum 4 Item 20. |
| 117 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.1 General System Description** | Existing LED Displays: Could the MTA provide interface definition documentation for the protocol actually used to communicate with the MARC III existing LED displays? This type of information is essential for the Contractor evaluation of the required scope of work. | All available information has been provided. |

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| 118 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.1 General System Description** | Could the MTA provide documentation about the actual MARC III train to wayside definition? | The MARC III cars do not have any existing train to wayside communication. |
| 119 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.1 General System Description** | Could the MTA provide documentation about the existing AVL system and interfaces? | See Addendum 4 Item 20. |
| 120 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.1 General System Description** | Could the MTA confirm the intent of re-using actual speakers? If so, the Contractor will need more technical information (specs, characteristics, OEM and part numbers, actual age) in order to be able to evaluate compatibility with the proposed new system. | All available information has been provided. |
| 121 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.2 Overhaul Requirements** | Could the MTA confirm how the ad hoc messaging is actually used on the MARC IV cars and what wayside infrastructure is used? | MARC IV cars have not been delivered yet. Currently MTA does not have ad-hoc messaging on any of its vehicles. |
| 122 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.2 Overhaul Requirements** | Could the Administration please provide any available documentation on the Axion components, system, and interface therewith? | Please contact Axion directly. |
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| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 123 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.2 Overhaul Requirements** | *CONTRACT DOCUMENT REQUIREMENTS: 3. Be fully compatible with MARC IV cars outfitted with the Axion Technologies communication system,*<br>*which will be operated in a mixed fleet environment.*<br><br>BIDDER'S REQUEST: 1. Could Bidder get TS of MARC IV before signed the contract to confirm the spec and to estimate accurately?<br>2. Could Bidder get the following in the design phase after signed the contract?<br>- the electric or radio detailed specification and ICD documents to hook up between MARC III and IV ICD includes specification of the hard wires, the timing, audio format and the network packet format for the discrete analog/digital wire, LonWorks and RS-485 ets<br>- the related to drawings of communication interface to check all of the electric or mechanic interface | Part 1: Please contact Axion directly.<br>Part 2: The MTA will provide available technical information during design review. |
| 124 | **Section VI Technical Specifications**<br><br>**Section 12 Communicatio ns** | **Item 12.3 Scope of Work** | *CONTRACT DOCUMENT REQUIREMENT:* A new communications system, complete with passenger emergency intercoms, automatic announcement system, and exterior speakers shall be provided that is compatible with the Axion MARC IV PEI and AAS.<br><br>BIDDER'S REQUEST: Please provide the Axion MARC IV communication system information, such as System Functional Description and System Diagram, so that the compatibility requirements can be examined. | Please contact Axion directly. |
| 125 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3 Scope of Work** | The Contractor's interpretation of section 12.3 is that the MTA is expecting all overhauled MARC III cars to be equipped with functional DTN trainlines including appropriate local gateways between the DTN and local car network (DCN) and data processing equipment in order to provide a complete compatibility with the MARC IV cars. Therefore, MARC III and MARC IV cars can be fully interoperable in mixed consist operation. Could the MTA please confirm that this interpretation is correct? | See Addendum 4 Item 21. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 126 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3 Scope of Work** | Could the MTA provide more information about the wayside infrastructure supporting the Paging system function? | The MARC III cars do not have any existing train to wayside communication. The MTA will provide available technical information during design review |
| 127 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3 Scope of Work** | Could the MTA clarify the meaning of the following sentence:<br>" Each cab car shall include cellular communications capabilities incorporated with the radio communications and capabilities to record all PA announcements"<br>Is the above statement defining separate functions or is it required to be all inter-related? | Yes, interrelated. |
| 128 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.2 Public Address and Intercom System**<br><br>**Item A PA Amplifier** | Please clarify what are the MTA's expectations in regards to compatibility with locomotives? The contractor has no locomotive interface and capabilities information. | See Addendum 4 Item 22 |
| 129 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.2 Public Address and Intercom System**<br><br>**Item C Exterior Speakers** | Could the MTA confirm that the actual MARC IV exterior speaker arrangement provides satisfactory performance? | MARC IV cars have not been delivered yet. |
| 130 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.2 Public Address and Intercom System**<br><br>**Item E System Response Time** | Could the MTA confirm that the actual MARC IV response time is considered satisfactory? | MARC IV cars have not been delivered yet. |
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| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 131 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.4 Automatic Announcement System**<br><br>**Item I On-board Equipment** | Could the MTA please confirm the location on the car (per car type, if applicable) of the existing Operator's control panel? | Cab cars F end. |
| 132 | **Section VI Technical Specifications**<br><br>**Section 12 Communicatio ns** | **Item 12.3.4.I Automatic Announcement System (AAS) – On Board Equipment** | *CONTRACT DOCUMENT REQUIREMENT:* 1. Destination signs - The contractor shall utilize the existing Electronic Interior and Exterior Destination Signs.<br><br>BIDDER'S REQUEST: According to page TS12-1, it appears that the original signs were replaced with the current ones. Please provide the system information for the existing signs for the interface design. | Please refer to TS Section 12. The signs have not been replaced. |
| 133 | **Section VI Technical Specifications**<br><br>**Section 12 Communicatio ns** | **Item 12.3.4.I Automatic Announcement System (AAS) – Networks** | *CONTRACT DOCUMENT REQUIREMENT:* The contractor shall propose a new train network to provide compatibility with the MARC IV cars, which may be used in a mixed consist environment.<br><br>BIDDER'S REQUEST: Please provide the network description and interface control documents for the MARC IV network. | Please contact Axion directly. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 134 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.2 Overhaul Requirements**<br><br>**Item 12.3.2, 12.3.3, 12.3.4 Scope of Work** | The Technical Specification currently requires the following functionalities in connection with the communication systems:<br>- Capacity to send ad hoc messages to specific cars (TS 12.2)<br>- Capacity to trigger PA recording based on "Vox control" (TS 12.3.2.A)<br>- Capacity to download via Wireless wayside to train link (TS 12.3.2.A)<br>- Capacity to perform exterior speaker audio level adjustments (TS 12.3.2.C)<br>- Capacity to perform automated announcements on exterior speakers (TS 12.3.2.C)<br>- Capacity to have an audible signal in the cab (TS 12.3.3.2)<br>- Capacity to perform textual paging based upon geographic location (TS 12.3.4.C)<br>- Capacity to perform wireless system database update (TS 12.3.4.N)<br><br>The Contractor understands that it is the MTA's intent to achieve complete compatibility between the MARC III and MARC IV cars with regards to the communication system. However, the Contractor would like to inform the MTA that, based on the information available to him, it would not be possible to achieve complete compatibility between the MARC III and MARC IV systems with the above listed requirements on the MARC III Cars. Behavior to new functionalities in mixed consist operation will not be consistent for all cars where new commands would not be recognized by existing MARC IV system. Indeed, to achieve compatibility between both types of cars, modifications would need to be performed on the MARC IV to also include these capabilities.<br><br>As such, the Contractor suggests modifying the TS in order to remove such requirements which would allow the MARC III and MARC IV cars to achieve compatibility. | No Change. With respect to overhauled MARC III cars and the existing MTA fleet, compatibility shall be such that the new system will not impede nor degrade the functionality of the existing communication systems. Features of the proposed MARC III system that are not available on the existing fleet, including the MARC IV system, are not expected to be installed in other vehicles. Design features in mixed consist with differing communication systems shall be made available to the maximum extent possible. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 135 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3 Scope of Work** | It is stated that "All trainline communication shall be compatible with existing MARC cars. The PA/IC functions shall be included in the digital audio trainlines in the cabling for the digital train network (DTN)."<br><br>In the above statement, does "MARC cars" refer exclusively to MARC IV cars? Please Clarify. | Please see MTA responses to questions 125, and 134. |
| 136 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.2 Public Address and Intercom System**<br><br>**Item A PA Amplifier** | Is the "Road Number" used in the "train consist including Road number for All Cars" the same as the car number (i.e. Unique number assigned to each car)? | Yes. |
| 137 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.4 Automatic Announcement System**<br><br>**Item B On-board Route and Station Information** | The station announcement algorithm is somehow different from what is implemented in MARC IV:<br><br>• MARC III overhaul page TS 12-10 (bullet 2 and 4) asks for "Next station" upon nearing the next station AND upon leaving a station.<br>• MARC III overhaul page TS-12-10 (bullet 3) asks for "This station" upon door open<br>• MARC III overhaul page TS-12-11 (bullet 5) asks for automated connection announcement (which is not supported in current MARC IV).<br>• MARC IV announces the "Next station" message upon leaving a station zone.<br>• MARC IV announces the "This station" message upon entering a station zone.<br><br>Does MTA agree that the actual MARC IV functionalities meet the MARC III overhaul project intent? | This will be addressed during design review. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 138 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.4 Automatic Announcement System**<br><br>**Item D Train Position** | It is requested that a consist operating in locomotive leading mode "the train position shall be calculated to reflect the first passenger car after the locomotive".<br><br>This is not compatible with MARC IV functionality and may cause operational discrepancies in mixed consist operation.<br><br>In MARC IV the situation is addressed simply by defining station zones in the AAS database that are sufficient to cover the longest train consist.<br><br>Does MTA agree that the actual MARC IV functionalities meet the MARC III overhaul project intent? | This will be addressed during design review. Please see MTA response to question 134. |
| 139 | **Section VI Technical Specifications**<br><br>**Section 12 Communica-tions** | **Item 12.3.4 Automatic Announcement System**<br><br>**Item G OCC User Functions** | It is stated that the OCC shall "generate a report on messages sent over the AAS".<br><br>Can MTA clarify what such a report shall contain? | Reporting capability shall be determined during design review and shall be within the capabilities of the proposed system. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
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| 140 | **Section VI Technical Specifications**<br><br>**Section 13 Cab Equipment** | **Item 13.2.2 Operator's Control Station** | *CONTRACT DOCUMENT REQUIREMENT:* Clean, Inspect, Test the PHW 9-Aspect ADU Clean, Inspect, Test, the PHW ATC and Supply 2-sensor axle generator<br><br>*BIDDER'S REQUEST:* After verifying, we think that the ATC equipment on these cars is made by Union Switch and Signal.<br><br>We can still do the work on the ADU, but we will not touch the ATC. This however will leave with an ATC that will not be PTC (I-ETMS) ready.<br><br>We believe the scope may need to be changed, as follows, depending on what your ultimate requirements are:<br><br>Replace ADU with new PHW 9_Aspect ADU<br>Replace ATC with new PTC Ready PHW ATC<br>Supply new 2-sensor axle generators.<br><br>Is this correct, or have we read the documents incorrectly? | It is anticipated that the MARC III cars will be equipped with new PTC equipment prior to overhaul, including a new ADU. |
| 141 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.2.4 Test Requirements and Facilities** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor shall perform tests to verify trainline integrity by coupling another car or locomotive at both ends. The vehicle shall be capable of receiving all signals from the lead locomotive as well as passing the signals through to the next car.<br><br>BIDDER'S REQUEST: Please clarify that this testing will be performed on the MTA's property. | Confirmed. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 142 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.3 Qualification Testing of New and Upgraded Components/ Subsystems** | *CONTRACT DOCUMENT REQUIREMENT:* All new and upgraded components/subsystems shall be subjected to design qualification testing once, if<br>successfully completed, to demonstrate conformance with the requirements included in the specification.<br><br>BIDDER'S REQUEST: Several truck parts will be changed to new OEM parts. The outline, material and characteristics are not<br>changed. Do you require any qualification testing? | Please refer to TS Section 14.3. |
| 143 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.4.2 Acceptance Tests on Administration Property** | "The Contractor shall be responsible for conducting acceptance testing (on Administration property) on each vehicle using an approved procedure. The cost of conducting<br>braking and dynamic tests on the Administration's railroad contractor's property shall be borne by the Administration, which is limited to test costs associated with test vehicle operation, vehicle movement, test train makeup, provision of functioning non-overhauled vehicles, and track time. All other testing costs shall be the responsibility of the Contractor. Qualification testing shall be successfully completed prior to beginning testing of the first vehicle."<br>Will the Administration insure a Cab Car will be available to perform Acceptance Testing on Non-Cab Cars? Trailer Cars will require a Cab Car in the Consist to perform the required Acceptance Tests. | Yes. |
| 144 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.4.3 Acceptance Tests at Contractor's Facility** | *CONTRACT DOCUMENT REQUIREMENT:* Trucks and Suspension. The completed truck system shall be checked for proper equipment interface and clearance, tram, leveling, turning radius, and verify all electrical, mechanical and pneumatic connections.<br><br>BIDDER'S REQUEST: If the truck is completely the same as the original truck including the sub-parts level, do we need to carry out the acceptance test as required? | Yes. |
| 145 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.4.3 Acceptance Tests at Contractor's Facility** | Can the Administration please confirm whether all of the listed tests in this section must be performed prior to the cars being shipped from the MTA's facility? | Confirmed. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 146 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.4.3 Noise and Vibration Tests, Item A3** | Section 14.4.3.A3 identifies "In-Vehicle Noise Test Procedure" "Contractor shall measure the sound levels inside the vehicle …. moving at speeds up to 125 mph."<br><br>Is the Administration anticipating testing the overhauled MARC III cars at speeds up to 125 mph on Amtrak's NEC Corridor with the existing fleet of locomotives? | Yes. |
| 147 | **Section VI Technical Specifications**<br><br>**Section 14 Testing** | **Item 14.4.3.1 FRA and APTA Inspections** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor shall complete the various FRA and APTA-required tests and inspections, as specified<br>elsewhere in the specification, for the respective subsystems.<br>BIDDER'S REQUEST: This requirement is not clear for each item. Please specify the FRA/APTA requirements for each item. | Where applicable, APTA/FRA requirements are called out in individual sections. |
| 148 | **Section VI Technical Specifications**<br><br>**Section 15 Materials and Workmanship** | **Item 15.3.1 Fasteners – General** | *CONTRACT DOCUMENT REQUIREMENT:* 15.3.1 To the maximum extent possible, the Contractor shall procure and deliver fasteners made in the<br>United States for use in the assembly and/or overhaul process. At a minimum, fasteners made in the Unites States shall be used for all safety-related application, including but not limited to, those applied to trucks, bolsters, carbody-to-truck interface, brake equipment, and couplers. Also, all structural bolts used for undercar and overhead mounted equipment shall be made in the United States. The steel shall be of high<br>quality and for use in general and critical applications. At a minimum, Grade 5 bolts, nuts, flat and lock washers shall be utilized in all critical applications, including but not limited to underframe equipment, mounts, and trucks.<br><br>BIDDER'S REQUEST: Please confirm that this requirement only applies to the renewed or replaced portion, except when used in the "as is" condition. | Confirmed. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 149 | **Section VI Technical Specifications**<br><br>**Section 15 Materials, Workmanship, and Standards** | **Item 15.8.6 Truck Parts** | *CONTRACT DOCUMENT REQUIREMENT:* Truck bumpers and snubbers shall be made of natural rubber or approved equivalent.<br><br>BIDDER'S REQUEST: If the truck is completely the same as the original truck including the sub-parts level, do we need to carry out the test as required?<br>1. If so, what is your request for 49 CFR 238. Please clarify.<br>2. As natural rubber is used, ASTM C1166, E662 cannot be met. Can you accept the deviation? | Please refer to TS Section 15.1. |
| 150 | **Section VI Technical Specifications**<br><br>**Section 15 Materials and Workmanship** | **Item 15.16.1 Wiring - Application and Installation** | *CONTRACT DOCUMENT REQUIREMENT:* Ten percent spare wires shall be provided in all wire bundles, conduits and ducts.<br><br>BIDDER'S REQUEST: Please inform if the Administration has already used the original spare wires for some modifications. | Please see TS 15.1, first paragraph. |
| 151 | **Section VI Technical Specifications**<br><br>**Section 15 Materials and Workmanship** | **Item 15.16.6 Wiring - Terminals** | *CONTRACT DOCUMENT REQUIREMENT:* Terminals, terminal blocks and connections used throughout the vehicle shall be the mechanical<br>solderless type, made by an approved U.S. manufacturer with a comprehensive line of terminal blocks, accessories and application tools available.<br><br>BIDDER'S REQUEST: Please confirm that this requirement only applies to the renewed or modified sections, except when used in the "as is" condition. | Confirmed. Please refer to Section 15.1. |
| 152 | **Section VI Technical Specifications**<br><br>**Section 16 Quality Assurance** | **Item 16.1 General System Description** | *CONTRACT DOCUMENT REQUIREMENT:* The Contractor's Quality System efforts shall be in compliance with the requirements of ANSI/ASQ Q9001- 1994. Where it differs from the terms of the Contract, the more stringent requirement shall take precedent. The Contractor need not be certified under ANSI/ASQ Q9001-1994.<br><br>BIDDER'S REQUEST: Please clarify if ANSI/ISO/ASQ Q9001-2008 will be applied instead of ANSI/ASQ Q9001-1994 since<br>ANSI/ASQ Q9001-1994 is the old version. | See Addendum 4 Item 23. |

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | MTA RESPONSE |
|---|---|---|---|---|
| 153 | **Section VI Technical Specifications**<br><br>**Section 16 Quality Assurance** | **Item 16.7.1 First Article Inspections** | "First Article Inspections (FAI) shall be required for selected overhauled equipment, and all new and upgraded systems, assemblies, and subassemblies, which are furnished by the Contractor and subcontractors."<br><br>With regards to overhauled equipment, what is the criterion for FAI selection?<br>Are the FAI units of overhauled equipment required to be preserved for the length of the contract, or are contractors only required to maintain photographs of the FAI units? | Contractors are only required to maintain photographs of the FAI units. |
| 154 | **Section VI Technical Specifications**<br><br>**Section 17 Management and Support Systems** | **Item 17.2.3.2 Progress Schedule**<br><br>**Item 17.4.2 Design Reviews** | Could the MTA please provide a detailed list of the systems or components that will be subject to the design review process of CDR, PDR, & FDR? | Please refer to TS section 17.4.2. |
| 155 | **Section VI Technical Specifications**<br><br>**Section 17 Management and Support Systems** | **Item 17.10 Manuals** | *CONTRACT DOCUMENT REQUIREMENT: Upon request from the Contractor, the Administration shall provide one (1) complete set of Vehicle Maintenance Manuals and Parts Catalogs. At the end of the Contract, the Contractor shall return the complete set of Maintenance Manuals and Parts Catalogs to the Administration. (CDRL 1718)*<br><br>BIDDER'S REQUEST: Will the authority provide editable electronic copies of the Maintenance Manuals and Parts Catalogs that are fully updated and reflect the current car configuration? | There is no editable electronic copy. All available OEM information has been provided. |

# A. SUMMARY OF WORK

# A. SUMMARY OF WORK

## A. GENERAL

The work shall be performed in accordance with the following documents:

A. The General Provisions

B. The Special Provisions

C. The Technical Specifications

D. Any forms, exhibits, and appendices included in the RFP

E. The Contractor's Proposal, including negotiated changes.

These documents (except Item E, the Contractor's Proposal) are contained in the Contract Specifications Book for the MARC III Coaches Overhaul issued by the Maryland Transit Administration (MTA) of the State of Maryland Department of Transportation.

Should the Proposer choose to take exceptions to the Contractual Documents, General Provisions, or Special Provisions, they should be submitted with the Technical Proposal in the same format as specified in Section C.2.

## A.2 BID/PROPOSAL EQUIVALENCE

All occurrences of the words "Bid" or "Bids" in the Contract Documents are synonymous with the words "Proposal" or "Proposals," respectively. All occurrences of the words "Bidder" or "Bidders" in the Contract Documents are synonymous with the words "Proposer" or "Proposers," respectively. All occurrences of the word "Offeror" are synonymous with the word "Proposer."

## A.3 DESCRIPTION OF THE WORK

### A.3.1 Background

The MTA procured 63 Kawasaki bi-level commuter coaches in 1999. The cars have been running in MARC Penn Line service on the North East Corridor at speeds up to 125 mph and on MARC's Brunswick and Camden lines.

This document is a Request for Proposal (RFP) and represents the first step in a competitive sealed proposal procurement conducted by the MTA. At the conclusion of the procurement process, the MTA's goal is to select a qualified Contractor that will commence the MARC III Coaches Overhaul Program in accordance with the executed contract.

### A.3.2 Contract Structure

The RFP for T-8000-0399 provides for the minor overhaul of up to sixty three (63) MARC III railcars.

### A.3.3 Base Scope of Work

The Contractor shall perform all work detailed in this RFP, unless otherwise specified. The scope of work to be performed includes furnishing all materials, tools, equipment, transportation, supervision and performing all labor and services necessary and incidental to pick-up and delivery, overhauling, and testing the MARC III coaches in accordance with Contract requirements. The Contractor's work includes, but is not limited to, the following:

A. Performing a complete overhaul of specified systems, subsystems, and components including engineering interface with new equipment and replacement of obsolete components. Unless otherwise noted, this shall include the provision of all renewal or replacement components, consumables, disposables, and standard hardware by the Contractor, as necessary to complete the overhaul.

B. Performing detail design for new and upgraded equipment, engineering, manufacturing, and testing of MARC III coaches.

C. Validating that the overhauled MARC III coaches are able to operate in normal revenue service containing overhauled and non-overhauled MARC III coaches, and to be compatible in all respects with existing non-overhauled vehicles in the MARC fleet, unless noted otherwise.

D. Transporting the MARC III coach to the Contractor's facility and returning them to the Administration's property.

E. Providing technical data, software, samples, and mock-ups for new and upgraded items, as required.

F. Performing qualification and acceptance testing.

G. Providing training programs to the MARC operations and maintenance staff in the usage and maintenance of all new and upgraded systems.

H. Executing the preparation and configuration control of as-built drawings, material and process specifications, and all other engineering, design and manufacturing information required to present the final as-built design of the work as developed and approved. Performing MARC III coach configuration verification as specified.

I. Updating maintenance and operational manuals and delivering completed inserts for manuals, parts lists, tool lists, and special tools lists, in the numbers specified.

J. Providing special tools and diagnostic test equipment for new and upgraded

systems.

K. Delivering spare parts as specified.

L. Administering warranty and reliability programs.

M. Supporting the MTA's Safety and Security Certification Program.

## A.4 TIME OF COMPLETION AND DELIVERY

This section details the dates for delivery of MARC III coaches, spare parts, manuals, and training. Notice to Proceed (NTP) will be issued up to, but not later than, 180 days following the closing date for proposals, or after receipt of Best and Final Offers (BAFO), whichever is later. NTP will be issued after receiving approval of the Contract by the Maryland Board of Public Works (BPW).

### A.4.1 Delivery of Contract Deliverables Requirements List (CDRL)

The RFP delineates various deliverables, and documents that are required to be submitted by the Contractor after NTP for the MTA's review and approval. The documents include plans, programs, forms, schedules, manuals, reports, certificates, drawings, and other required data in accordance with the Contract Deliverables Requirements List (CDRL) of each technical specification section.

The RFP also delineates various documents that are required to be submitted with the Contractor's proposal.

### A.4.2 Spare Parts

The Contractor shall ensure that an adequate supply of spare parts for new and upgraded equipment are available to keep the delivered MARC III coaches operational and in service without any outage of vehicles during acceptance, pre-revenue testing, or revenue service throughout the warranty period. Shipment of Mandatory and Recommended Spare Parts will be coordinated with the Administration's approval to ensure sufficient quantities of units to maintain all accepted vehicles in revenue service; no vehicle will remain out of service for more than 72 hours due to lack of mandatory spare parts and shall be subject to the provisions of Section F.4.4. If a vehicle is out of service in excess of 72 hours due to lack of mandatory spare parts, an equal amount of time [rounded up to 24-hour periods (1day)] will be added on to the warranty period of that vehicle(s).

#### *A.4.2.1 Replacement Parts*

In addition, the Contractor shall ensure that replacement spare parts are available, and assist the MTA in obtaining such parts, for five (5) years after NTP in order to support continued revenue service.

### A.4.3 Delivery of MARC III Coaches and Other Deliverables

Upon completion of a pre-delivery inspection at the Contractor's facility by the MTA and approval by the MTA for shipment, each MARC III coach shall be shipped directly to the MTA's Martins yard facility on a designated delivery track. The Contractor is responsible for all expenses associated with shipment and delivery of all vehicles. The contact information and address of the delivery track location is:

MTA Martin Yard
ATTN: Rex Springston, MARC Train Service; 410-454-7297
2700 Eastern Blvd.
Middle River, MD 21220

The Contractor shall deliver all other contract deliverables such as, but not limited to, project documentation, spare parts, salvage material, manuals, drawings, and special tools to an MTA designated location that may include the MARC office or MARC maintenance shop(s) that are located in the MARC train service operating territory.

Delivery of MARC III coaches shall occur when (1) the vehicle has been received on the designated delivery track; (2) all equipment removed for shipment has been reinstalled and reassembled by the Contractor; (3) the Contractor has completed to the MTA's complete satisfaction all adjustments and preparations required by the MTA and its operating railroad in order to run the MARC III coach in revenue service; (4) the vehicle is certified by the Contractor as being in compliance with the Contract's specifications; and (5) the vehicle is, in the MTA's sole discretion, ready for acceptance testing in accordance with the Technical Specifications.

The vehicles and other deliverables shall be delivered in accordance with the completion of work schedule in Special Provisions Section A.4.5. All days listed are in Calendar Days commencing with the effective date stated in the Notice to Proceed (NTP), or in absolute calendar dates, as appropriate.

### A.4.4 Release of MARC III Coaches to Contractor

The Contractor shall provide written notice of intent to access a MARC III coach, and the notice shall be received by the MTA 72 hours in advance of the Contractor's planned access.

Release of the first six MARC III coaches can, at the Contractor's request, occur at the earliest of NTP plus 10 days. Written notice of intent to access shall be received by MARC 72 hours in advance. Subsequent releases shall occur within 72 hours of receipt of a written request from the Contractor.

#### *A.4.4.1 MARC III Coaches Out of Service*

The Contractor's schedule should consider the requirements of this section as a constraint.

The Contractor shall be limited to a not-to-exceed of six MARC III coaches removed from MARC possession at any one time during the Contract; and the Contractor shall plan work according to this restriction. The not-to-exceed limit of MARC III coaches includes MARC III coaches that are not available for revenue service due to Contractor activities such as acceptance testing and equipment retrofits. The MTA shall not allow more than two overhauled MARC III coaches to remain unaccepted on MTA property.

### A.4.5 Completion of Work Schedule

| ITEM OF WORK | REQUIREMENT |
|---|---|
| 1. Deliver First (1st) Overhauled Vehicle – Trailer car | NTP + **270** days |
| 2. Deliver Second (2rd) Overhauled Vehicle – Cab car | NTP + **270** days |
| 3. Deliver Third (3rd) Overhauled Vehicle – Trailer w/Toilet | NTP + **270** days |
| 4. Deliver Fourth (4th) through Sixty-third (63rd) Overhauled Vehicle | Access + **120** days<br>or<br>NTP + **920** days<br>whichever occurs first |
| 5. Deliver Draft Revision of Manuals for Training Purposes | NTP + **240** days |
| 6. Complete Training | NTP + **260** days |
| 7. Deliver Diagnostic and Test Equipment and Special Tools | NTP + **465** days |
| 8. Deliver Mandatory Spare Parts | NTP + **465** days |
| 9. Delivery Recommended Spare Parts | NTP + **850** days |
| 10. Deliver Final Revision of Manuals | NTP + **920** days |
| 11. Deliver As-Built Drawings and All Deliverables (Including Conformed Specification | NTP + **920** days |

## A.5 MTA-FURNISHED FACILITIES AND EQUIPMENT

MTA/MARC will make available to the Contractor certain facilities and equipment at a site for support of acceptance testing and warranty. Specifically, the MTA/MARC will provide the following.

### A.5.1 MTA/MARC Facilities

MTA/MARC will provide the following facilities:

A. Access to one Yard track to unload, inspect, test, and prepare vehicles for delivery completion

B. Facilities for training, as required

C. Space for one (1) trailer, which shall be provided by the Contractor, and the Contractor shall be responsible for all costs associated with utilities

D. Shop space

E. Access on mainline track for acceptance testing during limited day time/night time and weekend hours.

## A.6 COOPERATION WITH OTHER CONTRACTORS AND INTERFACES

The MTA may at any time perform, or cause to be performed by other Contractors, work related to the Work under this Contract.

### A.6.1 Cooperation

The Contractor shall cooperate with such other contractors and shall conduct the operations in such a manner as not to cause any unnecessary delay or hindrance to the other contractor's work. The Contractor shall adjust and coordinate the work with theirs so as to permit proper and timely completion of all work.

### A.6.2 Interfaces

When any contractor or subcontractor performing work under or pursuant to another MTA contract is employed on work that interfaces with the work under this Contract, the Contractor, at their expense, shall provide to the MTA all necessary drawings, dimensions, data, software code, and other information, pertaining to new and upgraded equipment, necessary to ensure the complete, integrated, and proper design, manufacture, installation, and operation of all interfacing and connecting parts or systems.

The exchange of information will be coordinated by the MTA and the Contractor and copies of all the Contractor's data, drawings and correspondence relating to the above for interchange among contractors shall be furnished in sufficient quantity as requested by the MTA.

### A.6.3 Joint Use of Facilities

When the Contractor and any other contractors are employed on related work at the MTA's facilities, or are using the same storage areas or access routes, the Contractor shall be responsible for any damage or loss caused to the other by its action.

## A.7 INTENT OF CONTRACT

The intent of the Contract is to have all work being procured complete in every detail indicated. Unless otherwise specified, the Contractor shall furnish all labor, supervision,

material, tools, equipment, and incidentals necessary to complete the work in conformance with the Contract requirements.

## A.8 ABBREVIATIONS AND DEFINITIONS

Whenever in the Specifications or other Contract documents the following abbreviations and terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as specified herein. (**See also Article 1 of the General Provisions.)** These abbreviations and definitions are also applicable to the Technical Specification.

### A.8.1 Abbreviations

| | |
|---|---|
| AAR | Association of American Railroads |
| ADA | Americans with Disabilities Act |
| AGMA | American Gear Manufacturers Association |
| AIEE | American Institute of Electrical Engineers |
| AISI | American Iron and Steel Institute |
| ANSI | American National Standards Institute |
| APTA | American Public Transit Association |
| AQL | Acceptable Quality Level |
| AREA | American Railway Engineering Association |
| ASCE | American Society of Civil Engineers |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society of Testing and Materials |
| AWG | American wire gauge |
| AW0 | Empty vehicle weight |
| AW1 | Empty vehicle weight plus passenger seated load |
| AW2 | Empty vehicle weight plus passenger seated and normal rated standing load |

| | |
|---|---|
| AW3 | Empty vehicle weight plus passenger seated and full rated standing load |
| AWS | American Welding Society |
| CDRL | Contract Data Requirements List |
| cfm | Cubic feet per minute |
| CFR | Code of Federal Regulations |
| COT&S | Clean, Oil, Test, and Stencil |
| CPM | Critical Path Method |
| dB | Decibel |
| DB | Dry Bulb |
| DBE | Disadvantaged Business Enterprise |
| DOT | United States Department of Transportation |
| DTE | Diagnostic and Test Equipment |
| EEI | Edison Electric Institute |
| EMI | Electromagnetic interference |
| FAI | First Article Inspection |
| FCC | Federal Communications Commission |
| FOB | Freight-on-Board |
| FRA | Federal Railroad Administration |
| FS | Federal specification (and standard) |
| FTA | Federal Transit Administration, United States Department of Transportation |
| HEP | Head End Power |
| HVAC | Heating, Ventilation and Air Conditioning |
| Hz | Hertz |

| | |
|---|---|
| ICEA | Insulated Cable Engineers Association |
| IEEE | Institute of Electrical and Electronic Engineers |
| IES | Illuminating Engineering Society |
| IPCEA | Insulated Power Cable Engineers Association |
| IPS | Iron Pipe Size |
| ISO | International Standards Organization |
| JEDEC | Joint Electronic Device Engineering Council |
| JIS | Japanese Industrial Standard |
| LAHT | Low Alloy High Tensile Strength (steel) |
| LCD | Liquid Crystal Display |
| LED | Light Emitting Diode |
| LLRU | Lowest level replaceable unit |
| MDOT | Maryland Department of Transportation |
| MPH | Miles per Hour |
| MIL | Military Specification (and standard) |
| MTA | Maryland Transit Administration |
| MTBF | Mean Time Between Failures |
| NBS | National Bureau of Standards |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturers Association |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NOA | Notice of Award |

| | |
|---|---|
| NTP | Notice to Proceed |
| NTSB | National Transportation Safety Board |
| OCC | Operations Control Center |
| OEM | Original Equipment Manufacturer |
| OSHA | Occupational Safety and Health Administration, United States Department of Labor; Occupational Safety and Health Act |
| PA | Public address |
| PTFE | Polytetrafluoroethylene |
| PM | Preventive Maintenance |
| QA | Quality Assurance |
| QC | Quality Control |
| RFP | Request for Proposal |
| RMS | Root-mean-square |
| ROW | Right-of-Way |
| RTR | Ready to Run |
| SAE | Society of Automotive Engineers |
| SOW | Scope of Work |
| TBD | To Be Determined |
| TC | Train Control |
| TIR | Total Indicated Runout |
| TO | Train Operation |
| TOR | Top of (Running) Rail |
| TSC | Transportation Systems Center (DOT) |
| UHF | Ultra High Frequency |

| | |
|---|---|
| UL | Underwriters' Laboratories, Inc. |
| VDC | Volts Direct Current |
| VHF | Very High Frequency |
| VSWR | Voltage Standing Wave Ratio |
| WB | Wet Bulb |

**A.8.2 <u>Definitions</u>**

ACCEPTANCE – The act of a formal written acceptance by MTA that work, or legal obligations, or a specific portion thereof, under the Contract has been satisfactorily completed.

ACCESSIBLE – A car, car area or car feature that is ADA-compliant per 49 CFR 37 and 38.

ADDENDUM – A written interpretation, revision, supplement, or addition to any of the Contract documents.

ADHESION, PERCENT – During rolling contact, the maximum value of the ratio between the longitudinal tangential force and the normal force at the wheel-rail interface.

ADMINISTRATION – The Maryland Transit Administration of the State of Maryland Department of Transportation, including its duly authorized representative, the Procurement Officer and/or the Project Manager.

ADMINISTRATION-FURNISHED EQUIPMENT (AFE) – Equipment furnished by the Administration to the Contractor for installation in or on the vehicle.

ADVANCE POSSESSION – Prior to final acceptance of a vehicle, MTA, by written notice to the Contractor, may take possession and use of a vehicle or any other item of Work if, in its sole discretion, MTA determines that its possession and use has become essential in meeting revenue services operations. Upon receipt of such notice, the Contractor will be relieved of his responsibilities for maintenance and risk of loss, except those that result from the Contractor's own operations and negligence. The Contractor will remain responsible for completion of any item or correction of any defect in accordance with the Contract requirements and will still be responsible for timely performance. If a major defect (one which is not correctable within 72 hours or in the judgment of the MTA prevents the safe and reliable operation of the vehicle in service) is found during the initial thirty (30) calendar days the vehicle is available for revenue service after acceptance or advance possession, that 30-day period will be extended by as many days as required to correct the major defect to the satisfaction of the MTA and the date for

submission of the Contractor's invoice under Section H.4.2.A will be extended for the same number of days.

ALIGNMENT, HORIZONTAL – The horizontal location of a track as described by curves and tangents.

AMTRAK – National Railroad Passenger Corporation.

APPROVED/APPROVAL – Approved by MTA unless otherwise stated.

APPROVED EQUAL OR EQUIVALENT – An item, material, or method offered as a substitute for that designated herein, for which approval in writing has been obtained from MTA. The burden of proof that a substitute is, in fact, equal, shall rest with the Contractor.

AUXILIARY EQUIPMENT – Any mechanism or structure, other than the vehicle body, that performs a function at some time during the operation of the vehicle – e.g., heating and cooling subsystem, pumps, vehicle door mechanism, air compressor or hydraulic power unit, vehicle lighting.

AWARD – The decision by MTA to execute a contract to the selected Offeror after all necessary approvals have been obtained.

BID – The technical and management information and prices in response to the Invitation for Bids submitted in the prescribed format and on the prescribed forms.

BID BOND – The security, in the form approved by MTA, executed by the Bidder and Bidder's Surety as a guaranty that the Bidder will enter into Contracts with MTA, if awarded.

BIDDER – Any person or persons, firm, partnership, corporation, or combination thereof, submitting a bid for the procurement contemplated, acting directly or through a duly authorized representative.

BID ITEM – An item of work specifically described and for which a price, either unit or lump sum, is provided. It includes the performance of all Work and the furnishing of all labor, equipment, and materials described in the Contracts Document.

BRAKING, EMERGENCY – An irretrievable braking effort to fully stop a vehicle at a higher retardation rate than is obtained with a full service brake application.

BRAKING, FULL SERVICE –The normal maximum braking effort employed to stop a vehicle in the absence of an emergency stop signal.

CAB CAR – A car having a control station at one end, for the use in controlling a locomotive at the opposite end of the train.

CARSET – The quantity of equipment/components that is required for equipping one MARC III coach.

CHANGE ORDER – A written order, signed by MTA, directing changes in the Contract, within the changes clause of the Contract and establishing the basis of payment and time adjustments for the work affected by the changes.

CHECKED REDUNDANT – Equipment configurations that are generally implemented in complex hardware or complex hardware/software combinations (processors) that cannot be exhaustively analyzed by treatment of combination. Checked redundancy implies two, or more, independent parallel control units processing common input information. The results are subjected to a hardware voter or a voting processor to ensure that agreement exists between the parallel control units. The voting hardware or processor is required to be fail-safe. Any disagreement must cause the equipment to revert to a safe state that is self annunciation. In addition, the frequency of checking the parallel control units must be high enough to reduce the probability of multiple independent failures in the parallel control units during the interval between checks to an acceptably low in parallel control units due to common causes ("common mode failures") are not permitted.

CONDITIONAL ACCEPTANCE – Acceptance of an individual vehicle or other contract-related work by the Administration, subject to certain conditions and obligations that the Contractor is responsible for. If a major defect (one which is not correctable within 72 hours or in the judgment of the MTA prevents the safe and reliable operation of the vehicle in service) is found during the initial thirty (30) calendar days the vehicle is available for revenue service after acceptance or advance possession, that 30-day period will be extended by as many days as required to correct the major defect to the satisfaction of the MTA and the date for submission of the Contractor's invoice under Section H.4.2.A will be extended for the same number of days. (Also see Advance Possession.)

CONFORMED CONTRACT DOCUMENTS – The Contract Specifications Book revised to incorporate all changes made during the Bid period by Addenda and to incorporate information included in the Offer accepted by MTA.

CONSIST – The quantity and specific identity of vehicles that make up a train.

CONSOLE – The control panel located in the cab directly in front of the operator's seat.

CONTRACTS – The written agreements executed by MTA and the Contractor, covering the performance of the Work and furnishing of labor, materials, equipment, and tools, including work incidental to the procurement.

CONTRACT DATA REQUIREMENTS LIST (CDRL) – A matrix listing data, such as drawings, catalogs, reports, notices, and samples, required to be submitted by the Contractor. Wherever (CDRL) is seen throughout the specifications, refer to Section (i) of the Technical Specification for information.

CONTRACT SPECIFICATIONS BOOK – A document issued by MTA that includes the Invitation for Bids, Bid Forms, General Provisions, Special Provisions, Technical Specification, and other forms and exhibits.

CONTRACT TIME or COMPLETION DATE – The number of days set forth in the Specifications indicating the time allowed for completion of the work contemplated in the Contract. In case a calendar date of completion is specified in lieu of the number of days, such work shall be completed by that date.

CONTRACTOR –The person or persons, firm, partnership, corporation, or any combination thereof, who, as an independent Contractor, has entered into a Contract with MTA, agrees to furnish goods/services for a certain price.

CONTRACTOR'S QUESTIONNAIRE/PRE-AWARD EVALUATION DATA – The form upon which the Contractor shall furnish the information as to his ability to perform the Work, his experience in similar work, and his financial condition related to his ability to finance the Work, as well as certain technical information.

CORRECTIVE MAINTENANCE – Those actions performed, as a result of a failure, to restore an item to OEM-specified operating condition.

COT&S – Clean, Oil, Test & Stencil

COUPLER – A device for mechanically coupling vehicles together.

CSX – CSX Transportation, the legal successor to the B&O Railroad.

DAYS – Unless otherwise designated, means Calendar Days.

DRAFT GEAR – The energy-absorbing mechanism that attaches the coupler to the anchorage.

DWELL – The period of time measured from the instant a train stops at a station until the instant it resumes moving.

EXISTING MARC III COACH – As-built MARC III coach configuration prior to minor overhaul (a non-overhauled MARC III coach).

FAIL-SAFE – Equipment configurations that are implemented in hardware where each component has a known set of predictable failure modes that may be individually analyzed for their effect on equipment performance and function. Any failure or set of failures resulting from a single causative event must cause the equipment to revert to a state that is known to be safe with visual or audible warning devices displayed.

FAILURE – The inability of a system, subsystem, assembly, or component to perform its required function.

FAILURE RATE ($\lambda$)– The reciprocal of Mean Time Between Failures (MTBF).

FINAL ACCEPTANCE (Contract Work) – Upon due notice from the Contractor of completion of the Work except for warranty requirements, MTA will make an inspection. If at such inspection all Work provided for, and contemplated by, the Contract is found completed, such inspection shall constitute the final inspection and MTA will make the Final Acceptance as of that date and the Contractor will be notified of such acceptance in writing. After Final Acceptance, MTA will assume responsibility for materials and equipment, except where otherwise provided by the warranty.

FINAL ACCEPTANCE (Individual Vehicles) - Upon delivery and satisfactory completion of Acceptance Testing of each vehicle, the Contractor may present the vehicle to MTA for acceptance. If MTA finds upon inspection that the vehicle has been satisfactorily completed in compliance with the Contract, it may accept that vehicle as being completed.

GAUGE, TRACK – The distance between the inside face of rails, usually measured 5/8-inch below the top of the centerline of heads of running rails and at a right angle thereto.

GENERAL TERMS – Whenever the words "acceptable," "approved," "submitted," "designated," "established," "permitted," "required," "satisfactory," or "unsuitable" "unacceptable," "unsatisfactory," or "unsuitable" are used they shall be understood to imply "by the Administration" or "to the Administration" unless the context clearly indicates a different meaning. Whenever the verbs "submit," "designate," "notify," "bear," "use," "furnish," "install," "comply," and other like verbs are used, without being preceded by a subject, it shall be understood that the subject is the responsibility of the Contractor unless the context clearly indicates a different meaning.

HEADWAY – The time separation between two trains, both traveling in the same direction on the same track. It is measured from the time the front end of the leading train passes a given reference point to the time the front end of the train immediately following passes the same reference point.

HIDDEN DAMAGE – Structural Damage that is obscured by equipment, appurtenances, or accumulated debris, and affects the integrity and/or function of the structure. Cosmetic defects and dents shall not be considered as Hidden Damage. Structural Damage shall be considered as Hidden Damage only after completion of inspection and joint disposition by the MTA and the Contractor.

HIGH VOLTAGE – See PRIMARY POWER.

INDICATED – As described in the specifications, as-built drawings or as required by the other Contract documents.

INTERFACE – The point at which one system component or subsystem comes into physical or functional contact with another.

INTERLOCK – A condition whereby one function is dependent on the operation of another function.

JERK – The rate of change of acceleration or deceleration, normally measured in miles per hour per second per second.

L-10 LIFE – Rating life of anti-friction bearings, specified in millions of revolutions, during which 10 percent of the bearings in a bearing population will have failed. Conversely, the bearing life which 90 percent of the bearings in a population will achieve.

LATENT DEFECT – A defect that exists at the time of acceptance but cannot be discovered by a reasonable inspection.

LEAD CAR – In the direction of travel, the forward- most vehicle of the consist.

LOW VOLTAGE – The voltage used for auxiliary systems on the vehicle, is the nominal 72 VDC.

MEAN TIME BETWEEN FAILURES (MTBF) – The MTBF of an item is the ratio of the total operating time, *t*, accumulated by the total population of identical items to the total number of relevant failure, *F*, occurring within the population of identical items during time *t*. It is expressed quantitatively by the following equation:

$$\text{MTBF} = \frac{t}{F(t)}$$

NON-OVERHAULED MARC III COACH – As-built MARC III coach configuration prior to minor overhaul.

NON-RELEVANT FAILURE –

a. A failure caused by malfunctions of other equipment.
b. A failure caused by human error, except resulting from incorrect documentation.
c. A failure caused by accidents not associated with the normal operation of the item, such as collision, or striking a foreign object on the right-of-way.
d. A failure caused by operating the item outside of design or environmental limits.

NOTICE OF AWARD – A written notice to the Contractor of being the apparent awardee.

NOTICE TO PROCEED – A written notice to the Contractor of the date on or before which he shall begin the prosecution of the Work to be done under the Contract.

OFFEROR – See BIDDER.

OPERATOR (TRAIN ENGINEER) – Individual on board who is responsible for train operation in manual modes and overseeing train operation in any automatic mode.

OVERHAUL – Shall mean the restoration of items to an "as new" condition, or reconditioned functionally, as the case may be, per specification requirements. Overhaul shall include the complete disassembly of a subsystem, assembly or subassembly into its component parts and/or subassemblies. Overhaul shall include the cleaning, inspection, testing, adjustment, and lubrication; overhaul shall also include the repair or renewal of failed and/or worn component parts and/or subassemblies, with procedures and parts recommended by the OEM, and their reassembly into complete and functional assemblies. Component parts and/or subassemblies that cannot be repaired must be replaced with a new OEM part (unless otherwise noted). Component parts and/or subassemblies that can be repaired shall be repaired in accordance with procedures recommended by the OEM with no less than 30% of the original wear limit maintained, unless otherwise noted in the Specifications.

OVERHAUL PLAN - A system specific plan that details the work processes, procedures, and manufacturing work instructions required to complete the overhaul work for the particular system. This plan shall also identify and include the subcontractors/vendors information.

PARTIAL ACCEPTANCE – If at any time during the performance of the Work the Contractor completes a discrete portion of the Work, except vehicles, and makes delivery thereof, he may ask MTA to make a final inspection of that portion. If MTA finds upon inspection that the portion has been satisfactorily completed in compliance with the Contract, it may accept that portion as being completed and the Contractor may be relieved of further responsibility for that portion. Such Partial Acceptance shall in no way void or alter any of the terms of the Contract.

PERFORMANCE – The measure of output or results obtained by a component, system, person, team, and so forth, as specified.

PERFORMANCE GUARANTEE – The security, in the form approved by MTA, executed by the Contractor and his Surety, and paid for by the Contractor, guaranteeing complete performance of the Contract, and protecting MTA from loss due to the Contractor's inability to complete the Contract as agreed.

PROCUREMENT OFFICER – Any person authorized by a State agency in accordance with law or regulations to formulate, enter into, or administer contracts or make written determinations and findings with respect to them. The term also includes an authorized representative acting within the limits of authority.

PROJECT MANAGER – The Procurement Officer of the MTA or his/her designate.

PROPERTY – A railroad or transit agency.

PROPOSER – See BIDDER.

RAILROAD – The term "railroad" or "railroads" refers to any common carrier with whom the MTA has a contract, or other arrangement, providing the operation of its trains, or the maintenance of its equipment (presently Amtrak and CSX Transportation).

RELAY, VITAL – A relay whose function is necessary for the safe operation of the train and whose mode of failure is in the safe condition. Such relays must be approved by the AAR Committee E, Mainline Block Signals.

RELEVANT FAILURE –

a. A fault in the item while operating within its design and environmental specification limits.
b. Improper operation, maintenance, or testing of the item as a result of contractor-supplied documentation.

RELIABILITY – The probability of performing a specified function, without failure and within design parameters, for the period of time intended under actual operating conditions.

RENEW – Provide a new component or material that is identical to the existing component or material.

REPLACE – Provide an OEM-approved or Administration-approved substitute for an existing component or material.

REQUIREMENTS – The criteria that must be met in designing the vehicle.

REVENUE SERVICE – Service on established routes for use by the public, as distinct from pre-acceptance testing.

ROLL, BODY – The number of degrees in an arc, having its base at top-of-rail height and at the centerline of the track, swept by a point in the center of the roof as the vehicle sways from side to side during normal running at any speed on level tangent track.

SERVICE FAILURE - Any relevant failure occurring during revenue service operations, simulated revenue operations, or during equipment status checkouts to determine availability for revenue service, which results in one of the following:

a. Unavailability of a vehicle to start revenue service after successful completion of pre-departure checkout.
b. Removal of a vehicle from revenue service.
c. A schedule delay.

SERVICE PROVEN – The equipment shall offer a demonstrated history of satisfactory performance under duty cycle and equipment conditions similar to those encountered in the Administration's operations.

SINGLE FAILURE MODE – A single failure that inhibits the ability of a system, subsystem or component to perform its required function.

SLIDE, WHEEL – The condition is which the equivalent linear velocity of the wheel is less than the linear velocity of the vehicle.

SPECIFICATIONS – The directions, provisions, and requirements contained or referred to herein, together with all written agreements made, or to be made, that pertain to the product or process of performing the Work, or the quantities of Work and materials, to be provided under the Contract.

SPIN, WHEEL – The condition in which the equivalent linear velocity of the wheel is greater than the linear velocity of the vehicle.

STANDARD TRAIN – For performance test purposes, a specific consist size, configuration, and load.

SUBCONTRACTOR – Any individual, partnership, firm, or corporation who undertakes performance on the Contract, the partial or total design, manufacture, furnishing any material, or performance of any items of work required for the performance of the Prime Contract. As used herein, the terms subcontractor and subsupplier are synonymous.

SUBSYSTEM – A system that comprises functional elements interconnected within a system to perform a specific function.

SUPERELEVATION – On a curve, the vertical distance, measured in inches, that the outer rail is above the inner rail.

SURETY – The corporate body, licensed to issue bonds in the State of Maryland, bound with and for the Contractor for the full and complete performance of the Contract and for the payment for all debts pertaining to the Work. When applied to the Bid Bond, it refers to the corporate body acting as a guarantor that the Bidder will enter into a Contract with MTA.

TECHNICAL SPECIFICATION – The specifications, provisions, and requirements that detail the work and the materials, products (including the methods of manufacture, construction, assembly, and testing), and other requirements relative thereto.

TIME, REACTION – Time from the initiation of a step change of control signal to the first attainment of the new steady-state value of the controlled variable, within the designed accuracy.

TIME, RECOVERY – The time required for a system or condition to return to its original state (or some stated percentage of its original value) after being disrupted or de-stabilized.

TRAINLINE – The means of sending a signal or electrical power to all vehicles in a consist via a continuous electrical or fluid circuit connected through appropriate coupling devices.

TRAM – A condition of ideal truck geometry in which the axles are perfectly parallel and the wheels are longitudinally in perfect alignment. The centers of the journal bearings represent the corners of a perfect rectangle.

UPGRADE – Replacement of an existing component (or system) with a new component (or system) that has an improved design configuration and/or performance characteristics.

VEHICLE ( MARC III COACH)– A MARC III coach whose configuration and performance are described by this specification.

VITAL – A function or a unit which is critical to overall system safety.

WARP, TRACK – The vertical distance between the plane of any three of four rail head contact points (two on each rail) forming a rectangle, and the remaining point.

WEIGHTS, ACTUAL – The measured weights of finished vehicles ready to run.

ZERO SPEED – Vehicle velocity of less than 2 mph for more than 1 second.

# F. LEGAL REQUIREMENTS

# F. LEGAL REQUIREMENTS

## F.1 GENERAL

This section specifies the legal requirements applicable to the Work of this Contract, including liability, patents and copyrights, and warranty requirements.

## F.2 LAWS TO BE OBSERVED

The Contractor shall keep fully informed of all Federal, State, and local laws, ordinances, and regulations of all authorities that in any manner affect those engaged or employed on the Work or in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees. The Contractor shall protect and indemnify the Administration and its representatives against any claim or liability arising from or based on the violation of any law, ordinance, regulation, order, or decree, whether by itself, its employees, or its subcontractors. Particular note should be made of all contractual requirements and General Conditions of this contract. The provisions of this Contract will be governed by the law of the State of Maryland in accordance with COMAR regulations and Section 41, General Conditions.

### F.2.1 Discrepancies

If any discrepancy or inconsistency is discovered in the Contract Documents in relation to any such requirements of law, the Contractor shall immediately report the facts to the Administration in writing.

### F.2.2 ADA Compliance

The Proposer shall include a Certification of Compliance with the Americans With Disabilities Act (see Special Provisions Section C.5.4) with the Price Proposal that the Proposer's Technical Proposal complies with the requirements of the Americans With Disabilities Act.

### F.2.3 Hazardous Materials

Potential Proposers should note that asbestos may be present in the structure of the vehicle(s) to be overhauled. It is the Contractor's responsibility to lawfully remove, dispose, and/or perform asbestos abatement, as needed to accomplish the overhaul work. If any asbestos is found in the vehicle(s), the Contractor shall submit test data and other pertinent information indicating the location of asbestos. If any asbestos is found in the vehicle(s), asbestos abatement shall be addressed on a case-by-case basis and subject to the requirements of Special Provisions Section C.5.3, Miscellaneous Work Allowance.

Potential Proposers should note that hazardous materials may be present in the vehicle(s) to be overhauled. It is the Contractor's responsibility to lawfully remove and dispose of all hazardous materials, as needed to accomplish the overhaul work; and the work is considered to be part of its Price Proposal. The Administration will not accept change orders for removal and disposal of any hazardous material from the as-built vehicle(s).

All new material supplied by the Contractor that has MSDS shall be submitted as part of

the documentation.

## F.3 PATENTED AND COPYRIGHTED DEVICES, MATERIALS, AND PROCESSES

If the Contractor is required or desires to use any design, device, material, or process either patent or copyrighted, it shall provide for such use by written permission of the patent or copyright owner and a copy of such permission shall be provided to the Administration. Said written permission shall be supplied to the Administration prior to use of said covered materials. The Contractor and the Surety(ies) shall defend, indemnify and save harmless the Administration, the State, any affected third party, and any political subdivision from any and all claims of infringement by reason of the use of any such patented design, device, material, or process, or any trademark or copyright, and shall indemnify the Administration and the State for any and all costs, expenses, claims, and damages that it may be obliged to pay, by reason of any infringement, at any time during the prosecution or following completion of the Work.

If the use of any such design, device, material, or process is held to constitute an infringement and its further use is enjoined, the Contractor shall, at its own expense and at its option, either procure for the Administration the right to continue using it, or replace or modify same to eliminate the infringement.

### F.3.1 Notice of Impending Claim

The Contractor shall report to the Administration, promptly and in reasonable written detail, any impending claim or suit for patent or copyright infringement based on the performance of this Contract of which the Contractor has knowledge, and shall require its subcontractors to notify it of any such claim or suit.

### F.3.2 Access to Contractor Information

In the event of any claim or suit against the Administration because of any alleged patent or copyright infringement arising out of the performance of this Contract or out of the use of any supplies furnished under this Contract, the Contractor shall furnish to the Administration, when requested by the Administration, all evidence and information pertaining to such suit or claim including all evidence and information in the possession of the Contractor. This notice and assistance requirement shall be included in all subcontracts. In its subcontracts, the Contractor shall require its subcontractors to provide all evidence, information, and assistance necessary to defend such suit or claim.

### F.3.3 Agreement to Settle Claim

The Contractor may either defend or settle any claim or suit alleging patent or copyright infringement arising out of the performance of this Contract. The Contractor shall have no responsibility for any compromise or settlement made by the Administration without Contractor's prior written consent. The parties agree to cooperate with one another in the defense of any such claim and suit.

## F.4 WARRANTY OF WORK

This section supersedes Article 29, "Warranty of Work," as set forth in the General Provisions.

### F.4.1 General Warranty

The Contractor warrants that the title conveyed under the terms of this Contract shall be good and its transfer rightful and that all goods, supplies, systems, and equipment shall be delivered free from all security interests or other liens or encumbrances whatsoever. The Contractor also hereby agrees to warrant and defend the title against all persons claiming the whole or any part thereof.

The Contractor warrants that all goods, supplies, systems, equipment, design, and all work covered by this Contract, including subcontractors and suppliers (except Administration-furnished equipment), shall be satisfactory for their intended purpose, shall conform to, and perform as called for in, the Contract requirements and specifications, and shall be free from all defects and faulty materials and workmanship. Any goods, supplies, systems, equipment, design, and Work found to be defective within the warranty period shall be repaired, remedied, or replaced by the Contractor, free of all charges including transportation. Any latent defects discovered, including but not limited to goods, supplies, systems, equipment, design, and work shall be repaired, remedied, or replaced by the Contractor free of all charges, including transportation.

#### F.4.1.1 Warranty Period

The Contractor shall guarantee all replacement parts and systems of the MARC III coaches, as well as repaired parts, for a period of two (2) years for new and upgraded parts, and for a period of one (1) year for overhauled parts, from the date of conditional acceptance of each car. The guarantee on parts replaced or repaired under warranty shall extend from the time of replacement or repair. If a subsystem or component of a car has not been accepted when the car is placed into revenue service, the warranty on that subsystem or component shall extend two (2) years for new and upgraded items and one (1) year for overhauled items, after the subsystem or component has been accepted. If car is out of service in excess of 72 hours due to lack of spare parts, an equal amount of time rounded up to 24-hour periods (1 day) will be added onto the warranty period of that car.

#### F.4.1.2 Spare Parts

The warranty for both mandatory and recommended spare parts, hereinabove excepted in Section F.4.1.1, shall extend two (2) years from the placement of each spare part into service. The warranty period shall not exceed two (2) years after final acceptance of the 63rd overhauled MARC III coach.

#### F.4.1.3 Engineering Support

The Contractor shall, at its own expense, have a competent engineering staff available on request to assist the Administration's staff in the resolution of engineering or design problems within the scope of the specifications that may arise during the first two (2) years after the final acceptance of the last MARC III coach. The Contractor's engineering representatives shall be

available to assess problems on-site within 48 hours of notification during the Contract period if required by the Administration. Engineering support shall be made available to support the overhauled MARC III coaches during the remainder of their life span on terms mutually agreed upon by the Contractor and the Administration, with any applicable labor rate charges being no more than the Contractor's most favored customer.

#### F.4.1.4 Safety Defects

Any safety related defect identified by the Administration or the Contractor, which affects any products or services provided under the contract, shall be repaired by the Contractor using its own resources, work force, tools, equipment, and parts for a two (2) year period from the date of final acceptance of the last MARC III coach. Repairs shall be carried out in accordance with the requirements of Section F.4.4. This provision is in addition to any statutory rights available to the Administration.

### F.4.2 Warranty Period – Specific Subsystems –NOT USED

### F.4.3 High Failure Rate

In addition to the above warranty, if any single failure mode on a single component of any new, upgraded, or overhauled subsystem develops and the number of such failures reaches 10 percent of the population of an item in any single year during the warranty period, the Contractor shall provide, at the Administration's option, full approved repairs, adjustments, or redesign and replacement, at no cost to the Administration. Such correction shall be to the Administration's satisfaction and shall include correction to all cars, including cars for which the warranty period has expired.

"Single year" is defined for the purpose of this section as a 12-month period starting at commencement of placing the first MARC III coach into revenue service until the warranty period expires. The failure rate shall be computed by using relevant failures as defined in Section A.8.2 of the Special Provisions, which shall be counted for the purposes of determining this statistic.

### F.4.4 Corrective Work Requirements

The Administration will give the Contractor a written notice of observed defects or failures with reasonable promptness, but in any event not later than 30 days after observing the defect or failure. Unless otherwise directed in this notice, the Contractor shall commence corrective work at the time specified by the Administration, but in no event later than 2 working days after notification by the Administration of the defect or failure. The Contractor shall diligently pursue such corrective work to completion.

Replacement parts and repairs provided pursuant to corrective work hereunder shall be subject to prior approval of the Administration and shall be tendered and performed in the same manner and extent as items originally delivered.

To prevent delays and disruption to Administration's operations, the Administration shall have the right, when practical and feasible, in its opinion, to the continued use of any such goods, equipment, systems, and Work deemed defective or unsatisfactory, until they can be

taken out of service pursuant to the corrective work hereby undertaken by the Contractor. In addition, the following provisions shall be applicable to this Contract:

A. If a defect or failure, in the opinion of the Administration, constitutes an emergency that will jeopardize or impair the operations and schedules of revenue service, the Administration shall provide the Contractor both verbal and written notice thereof and the Contractor shall commence corrective work within 24 hours after receiving verbal notice. Nothing herein shall be construed as preventing MTA's forces or the Contracting Railroad (Amtrak or their successor) from immediately commencing corrective work, with labor cost at the expense of the Contractor, provided that all such corrective work is performed in accordance with the Operations and Maintenance Manuals furnished by the Contractor.

   The Contractor shall reimburse the Administration or make replacement (at the option of the Administration) for any spare parts or materials required by the Administration to perform any corrective work with which it must proceed. Such corrective work by the Administration's forces shall not be construed to invalidate Contractor's warranties and other provisions contained in this Section.

B. Under such emergency conditions, the Contractor, with approval of the Administration, may utilize spare parts from the Administration's spare parts inventory, provided that the Contractor agrees to replace each spare part used under terms and within the time period to be prescribed by the Administration.

C. The warranty provisions described in Special Provisions Section F.4.1.2 shall be applicable to each spare part replaced by the Contractor for parts used pursuant to Special Provisions Section F.4.4(B).

D. During the delivery period and the general warranty period, the Contractor shall maintain qualified representatives at the Administration's site to be available for corrective work performed during delivery and for a period of one year after final acceptance of the last vehicle. The Contractor shall maintain sufficient resources to support the remaining warranty.

### F.4.5 <u>Reliability Requirements for Overhauled MARC III Coaches</u>

The overhauled MARC III coaches shall meet the reliability program requirements specified in the Technical Specifications. The Contractor shall expand the reliability program as needed to take into account all overhauled, new, and upgraded equipment provided in the major vehicle subsystems as defined.

Under all conditions, the Contractor shall be responsible for the design, manufacture and installation (including retrofit of the entire fleet) of all changes into all overhauled MARC III coaches. In addition, such changes and corrections will be incorporated in any undelivered cars prior to delivery. The Administration reserves the right to retrofit any or all changes on accepted cars using Administration personnel with compensation from the Contractor for the expenses based on reasonable maintenance times and prevailing hourly rates.

### F.4.6 Costs

In addition to all other warranties, expressed or implied, the Contractor, at his sole expense, hereby agrees to bear all costs of corrective work, which shall include, but not be limited to, troubleshooting, removal, necessary disassembly, transportation, reassembly, repair, or replacement of the defective goods, supplies, systems, equipment, and Work; as well as necessary disassembly, reassembly, and repair of all adjacent facilities and structures of the Administration and its construction contractors damaged as a result of the malfunction of the herein warranted goods, supplies, systems, equipment, and Work, including the expense of restoring the aforesaid facilities and structures and the cost of providing ingress and egress to these facilities and structures to accommodate corrective work.

### F.4.7 Failure to Perform Corrective Work

If the Contractor is unable or fails within the time prescribed to commence and diligently pursue and complete the corrective work, the Administration is by this provision authorized by the Contractor, at the option of the Administration and upon written notice to the Contractor and the Surety(ies), to contract with another or use their own forces to perform the warranty work. The Contractor hereby agrees to reimburse the Administration for all costs and expenses in connection with such corrective work, including, but not limited to, reasonable attorney's fees.

### F.4.8 Timeliness

It is understood and agreed that time is of the essence with respect to all corrective work to be undertaken pursuant to the warranty herein contained, expressed or implied.

### F.4.9 Performance Bond

The Contractor's Performance Bond shall continue in full force and effect during the period of the warranties herein specified; however, after Final Acceptance of the last MARC III coaches, a new Bond equal to twenty-five **(25)** percent of the contract value will be acceptable.

### F.4.10 Other Legal Rights

The rights and remedies of the Administration under this Section are not intended to be exclusive and shall not preclude the exercise of any other rights or remedies provided for in this Contract, or by law or otherwise.

## F.5 RISK OF LOSS

Risk of loss will pass to the Contractor upon release of the MARC III coaches to the Contractor. Risk of loss will pass to the Administration upon delivery of each overhauled vehicle, as defined in Special Provisions Section A.4.3, except that loss or damage to equipment resulting from acts of the Contractor shall be the responsibility of the Contractor.

## F.6 NOTICE TO THE ADMINISTRATION OF LABOR DISPUTES

Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this Contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Administration.

The Contractor shall insert the substance of this section in any subcontract hereunder. Each subcontract shall provide that if its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately provide the subcontractor, on the next higher tier, or the Prime Contractor, as the case may be, with all relevant information regarding the dispute.

## F.7 INSURANCE – LIABILITY AT ADMINISTRATION INSTALLATIONS

Throughout the entire period during which Work is performed under this Contract at Administration installations, the Contractor shall, at his expense, procure and maintain insurance covering liabilities that could result from such Work. The minimum insurance required by these provisions is described in sections F.7.1, F.7.2, and F.7.3.

### F.7.1 Worker's Compensation

Insurance shall be sufficient to cover all claims payable under statutory requirements for Worker's Compensation. Self-insurance will be permitted if the Contractor can demonstrate to the Administration that all applicable approvals, regulations, and laws have been complied with.

Worker's Compensation Insurance (see Section IV-Proposal Exhibits; Exhibit K, Item D-Workers Compensation Insurance)

All States Endorsement

### F.7.2 General Liability, Including Product Liability

General liability, including product and contractual liability, shall have a combine single limit of $10 million with product liability extending to 5 years after acceptance of the last coach. In lieu of a 5-year policy, such coverage may be an annual insurance policy renewable annually for 5 years. If coverage is not available, the Contractor shall warrant the $5 million combined single limit of liability for 5 years after acceptance of the last coach.

See Section IV-Proposal Exhibits; Exhibit K, Item D–Commercial General and Umbrella Liability Insurance.

### F.7.3 Automobile Liability

See Section IV-Proposal Exhibits; Exhibit K, Item D–Automobile and Umbrella Liability Insurance.

### F.7.4 Certificate of Insurance

At all times during the period specified above, the Contractor shall maintain with the Administration a current Certificate of Insurance showing the minimum insurance as required in Section F.7.1, F.7.2, and F.7.3 and provide 30 days written notice to the Administration by the insurance company prior to cancellation or material change in the policy coverage. The Contractor shall submit the Certificate of Insurance to the Administration at least 30 days before the planned performance of any work at the installation site.

### F.7.5 Subcontractor Insurance

The Contractor shall require subcontractors at any tier who will perform work at an Administration installation to procure and maintain the insurance as specified in section F.7.1 and F.7.3 during the entire period of their performance at the Administration installation site. The Contractor shall furnish, or assure that there has been furnished to the Administration, a current Certificate of Insurance meeting the requirements of Section F.7.4 for each such subcontractor 5 days before the entry of subcontractor's personnel on the Administration's installation site. The Contractor shall ensure that each subcontractor is adequately covered under the provisions of F.7.2 by the Contractor's policy or by the subcontractor's own insurance.

### F.7.6 Insurance Companies

In every instance, insurance shall be written and maintained with companies acceptable to the Administration and authorized to do business in the State of Maryland.

## F.8 RIGHTS IN TECHNICAL DATA

Technical data means any and all information of a scientific or technical nature, regardless of form or characteristics, to be furnished by the Contractor pursuant to this Contract. It includes, but is not limited to, development or engineering work plus the information used to define a design or process or to procure, produce, support, maintain, or operate the goods, supplies, systems, and equipment furnished hereunder. Examples of technical data include research and engineering data, proprietary software, production drawings, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information.

The Administration, its employees and consultants, shall have the unlimited right to use, duplicate and disclose, in whole or in part and without charge, all technical data, in any manner and for any purpose when, in the opinion of the Administration, such use is required by the Administration in the installation, operation, modification, maintenance, repair, replacement, overhaul, or training involved with the MARC III coach and its system, subsystem, equipment, or LLRU.

The Contractor hereby sells, assigns, conveys and grants to the Administration and its subsidiaries and affiliates, and any successor entities thereto, all of the Contractor's rights, title and interest in any software specifically developed under the Contract, and/or a previous version of the software that was modified or configured by the Contractor in connection with

the Contract, and provided hereunder, in all forms of expression whatsoever, including but not limited to:

A. Source and object code
B. Flow charts, block diagrams, and all related documentation
C. All copyrights, trade secrets, inventions (whether or not patentable)
D. Proprietary rights and intellectual property contained therein.

If the Contractor delegates the development of any of the software, licensed or otherwise, to any subcontractor, supplier or vendor, then the Contractor shall obtain from them, for the benefit of the Administration, a transfer of all rights in accordance with the terms of the Contract. The Contractor shall provide the Administration with documentation satisfactory to the Administration confirming the Contractor has acquired on the Administration's behalf all such rights. One time fee for licensing software shall apply to all new and upgraded vehicle equipment without additional charges.

All software, licensed or otherwise, provided by the Contractor in connection herewith and the ideas, processes, and methods therein contained shall be the property of the Administration, free from any claim or retention of rights thereto on the part of the Contractor, or Contractor's employees, Contractor's subcontractors or any third parties. The Contractor hereby warrants and represents that it possesses all right to and interests in the software and all portions thereof, or otherwise has the right to grant to the Administration the rights provided for in this Contract, without violating any rights of any third party, and there are currently no actual or threatened suits by any such third parties based on an alleged violation of such rights.

With respect to software that is provided to the Administration pursuant to this Contract, but was not specifically developed by the Contractor in connection with the Contract; the Contractor hereby grants to the Administration and its subsidiaries and affiliates, and any successor entities thereto ("Licensees") a perpetual, non-exclusive irrevocable license to use, reproduce, modify and maintain the licensed software, in any form whatsoever, including but not limited to source and object code, for any purpose whatsoever, except as may be set forth herein. As used above, "irrevocable" shall include, but not be limited to, the right of the Administration to continue using the licensed software irrespective of any breach or default pursuant to the terms hereof.

The Licensees may use the licensed software on any and all equipment configurations of whatever make, manufacturer and/or model, owned, controlled or contracted for by the Licensees, or any entities controlling, controlled by, under common control with the Licensees, or which may assume the responsibilities of the Licensees. Irrespective of the number of equipment configuration(s) upon which the licensed software is used, the licensees shall pay no additional license fee, in addition to the right to reproduce the licensed software, as it deems necessary and, subject to the limitations specified herein, to provide the licensed software, including the source and object code forms thereof and the documentation therefore, to any other person(s) or entity(ies) for their use in connection with providing goods and/or services to the Licensees.

Licensees shall not sell, distribute or otherwise disclose the licensed software to any third parties, provided that they shall have the right to sell, distribute or otherwise disclose the licensed software to its agents, contractors, vendors, and consultants for any purpose relating to the operation, evaluation, modification, and/or maintenance of the licensed software, or any equipment or systems related thereto.

Upon approval of the Administration, standard commercially available software packages may be embedded in the software, provided that the Contractor shall obtain for the Administration all licenses as necessary to use such embedded software in perpetuity without additional fee or cost. Except as specifically restricted in the applicable third-party license agreement, all terms of the Contract shall apply to the embedded software package. The Contractor shall identify and provide complete documentation for any embedded software packages. The Administration shall receive full rights to any modifications made by the Contractor to embedded commercial software.

The Administration expects to be able to maintain all software developed for the overhauled vehicles, including vehicle-related software. Therefore, documentation must be complete and accurate including all source code.

If the Contractor does not provide all documentation on commercial software packages and proprietary software packages, the Contractor shall provide a method whereby the Administration receives at no additional charge all modifications, updates, and query service from the Contractor and/or the original vendor.

## F.9 AUDIT AND INSPECTION OF RECORDS

The Contractor shall permit the authorized representatives of the Administration, the U.S. Department of Transportation, and the Comptroller General of the United States to inspect and audit all data and records of the Contractor relating to his performance under this Contract for a period of up to 3 years following completion of this Contract.

## F.10 INDEMNITY

In lieu of General Provision 13, General Indemnity, the Contractor shall indemnify and save harmless the Administration, and its officers, agents and employees, from any and all claims, demands, suits, loss, damage, injury and liability, including costs and expenses incurred in connection therewith, resulting from, arising out of, or in any way connected with the performance of the Contract, including delivery and any loading of supplies and equipment.

Such indemnification shall not be construed to include damages or injuries arising or occurring from the sole negligent acts of the Administration, its officers, agents and employees.

# SECTION 01
# CARBODY

# SECTION 01
# CARBODY


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# SECTION 01
# CARBODY

## 1.1 GENERAL SYSTEM DESCRIPTION

The carbody shell is a three level semi-monocoque structure in which the longitudinal members, vertical and transverse framing members, as well as the skin sheeting, consist of low carbon content stainless steel.

## 1.2 OVERHAUL REQUIREMENTS

The carbody shall be cleaned, inspected, and overhauled to repair all damaged or defective areas of the structure and car shell. At a minimum the Contractor shall submit a Carbody Overall Overhaul Plan that includes cleaning, inspection, and overhaul procedures for all areas of the carbody structure and car shell identified in this section for Administration approval prior to start of work **[CDRL 101].**

The exterior of the carbody shall be thoroughly inspected for cracks, deformations, and corrosion. Defects discovered shall be brought to the attention of the Administration and repaired in accordance with the approved procedures. The Contractor shall bid on repairing a minimum of twenty (20), 12-inch by 24-inch carbody exterior areas. The number of 12-inch by 24-inch areas will be determined at the outbound inspection for each car.

It is the Contractor's responsibility to survey each car and itemize the defect locations and repairs required.

Replacement of body parts or underfloor equipment shall preserve all external clearance requirements and clearance requirements between the trucks and car body or underfloor equipment.

New apparatus, such as material or configuration changes, supplied during the overhaul shall be the same for all vehicles and shall be fully interchangeable.

### 1.2.1 Sides and Ends

End frames and side frames are composed primarily of framing members and skin sheet of low carbon content stainless steel.

Sides and ends shall be inspected, cleaned, and overhauled with all decals removed and renewed with new decals.

The Contractor shall clean, repair, and overhaul the car body side and end sheets, including covering small superfluous mounting holes**.**

### 1.2.2 Underframe

The underframe primary members at the mid floor level at the car ends consist of HSLA structural steel for the end sills, draft pockets, and body bolsters. Underframe members and skin sheet in the center and transition areas consist of low carbon content stainless steel.

The Contractor shall clean, repair, and overhaul all exposed areas of the underframe, including the end and center sections, draft gear, coupler pockets, and the areas around the truck bays.

All critical welds, where readily accessible: end underframe to sideframes, draft pockets, body bolsters, end sills, end plates, underframe transitions, anti-telescoping plates, collision posts, and corner posts shall be inspected, documented, and repaired if required.

### 1.2.3 Weld Inspection Plan

In the Carbody Overall Overhaul Plan, the Contractor shall submit a plan for the weld inspections of critical areas to include locations, type of inspections, and criteria and weld repairs.

All end underframe carbody and equipment connections (welded or bolted) shall be inspected for cracks, corrosion, or material deterioration and repaired. In the Carbody Overall Overhaul Plan, the Contractor shall submit a plan for inspection of connections, including criteria for renewal.

All areas of the buffer wings and stairwell support members showing evidence of corrosion shall be cleaned and repaired. Buffer wear plates and their fasteners shall be renewed with new wear plates and fasteners per OEM requirements. Buffer stems shall be disassembled, cleaned, inspected, and springs renewed.

Visible portions of end underframe crossmembers and floor beams are to be cleaned, inspected for damage, cracks, loss of section to corrosion, and repaired. End underframes are to be overhauled, primed and then given 3 coats of black enamel after inspection and repairs.

Strip and inspect the center underframe for any cracks or openings in the corrugated sheet. Overhaul by repairing cracks in members or welds or by overlaying of corrugated sheet and repaint with approved undercoating material. In the Carbody Overall Overhaul Plan, the Contractor shall submit repair procedures for each configuration and material review and approval before start of repairs.

Remove all covers of the undercar 480 VAC duct bank and wiring and ducts. Inspect and clean all cleat block connections, cable connections, and separators. Overhaul duct bank covers and reinstall.

Inspect and overhaul existing jacking pads as needed. Any failed welds shall be identified and repaired.

In the Carbody Overall Overhaul Plan, the Contractor shall submit a repair procedure for jacking pad welds to the Administration for review and approval.

Replace any damaged car body thermal insulation with same density aluminum faced insulation, or Administration approved equal.

### 1.2.4 Bolster Anchor Brackets

Existing bolster anchor brackets and fasteners shall be cleaned, visually inspected, overhauled, and painted.

Suspected cracks or separation shall be examined by dye penetrant inspection. If crack or separation is confirmed, the bracket shall be renewed.

If the structural integrity of the bolster anchor bracket is compromised by loose fasteners, evidence of two halves slipping or by damage to existing welding, it shall be renewed.

### 1.2.5 Undercar Boxes

All undercar boxes shall be cleaned, inspected, and repaired if dented, pierced, or deformed. Undercar box seals and gaskets shall be renewed for water tightness.

New cotter keys shall be applied to drain holes.

Mounting brackets shall be inspected overhauled, repaired as needed, and new mounting fasteners applied to OEM specified torque values.

End of car trainline junction boxes shall be inspected overhauled, and repaired as needed. Seals and gaskets shall be renewed for water tightness.

### 1.2.6 Collision Posts and Corner Posts

The accessible portions of collision posts, corner posts, and adjacent structure at each end of the car shall be cleaned and inspected for corrosion, cracks, and weld separation on every car.

Drain holes shall be cleaned; hoses, and/or fittings shall be renewed.

### 1.2.7 Roof

All roof levels shall be cleaned, water tested, and inspected. Any damaged side and top roof sheets shall be repaired.

A minimum of four upper level ceiling panels and six light fixtures shall be removed to view interior roof insulation during the water test.

Water leak areas shall be repaired using a cover plate of matching sheet configuration. In the Carbody Overall Overhaul Plan, the Contractor shall submit repair procedures for each configuration and material prior to start of repairs.

Overhaul low roof HVAC mounting feet, air intake, HVAC shrouds, latches, hinges, spall shields, and renew the seals.

Clean, inspect and re-seal existing low to high transition seams.

### 1.2.8 Windows

All existing passenger side window and windshield glazing, sash glass, and mounting rubber shall be removed. All glazing shall be renewed. All overhauled MARC III cars, including VRE style MARC III cars, shall match with identical frames, glazing and gaskets.

All mounting rubber and strip fillers shall be renewed.

All passenger side window openings shall be provided with emergency units on each side of all levels of the car. Not all of the passenger side windows are emergency units. Those that are emergency units shall remain emergency units and be overhauled per the rest of the section.

Emergency window units shall utilize two handles per unit, with a handle to remove the removable glazing rubber, and a handle to remove the window glass for emergency evacuation purpose.

The window glass removal handle shall be located behind the handle for removal of the glazing rubber.

All windows and windshields shall comply with all current requirements of 49 CFR223 and 49 CFR238.

### 1.2.9 End Vestibule

Vestibule interiors and plenum areas above ceilings shall be thoroughly cleaned, inspected, and overhauled to restore original functionality.

Existing safety bars and retainers shall be cleaned and overhauled.

Vestibule floors shall be thoroughly cleaned, inspected, and overhauled to restore original functionality and appearance.

The Contractor shall clean, inspect, repair any corrosion damage.

### 1.2.10 Stepwells and Trapdoors

A. Stepwells. Clean, inspect, and overhaul all visible parts of the stepwell, supports, and step treads.

Inspect all hardware and renew if missing, damaged, or loose. Replace all reflective tape and decals with new.

As an option, the Contractor shall propose a replacement stepwell surface as an improvement to the OEM design. The Contractor shall submit the proposed design and installation procedures for Administration approval. **[CDRL 103]**

B. Trap Doors. Existing trap doors and related hardware shall be removed, cleaned, and overhauled.

Trap door heaters shall be disassembled, overhauled with all wiring renewed, reinstalled, and tested. The Contractor shall propose a design modification to replace the trapdoor heater wiring and loop design between the car body and heater to address the problem of wear and breakage for Administration review and approval. **[CDRL 104].** Broken or incomplete welds shall be repaired. Torsion springs shall be renewed. All weather stripping and thresholds shall be renewed. Trap doors shall be re-installed and adjusted for proper operation.

### 1.2.11 Safety Appliances and Handholds

Inspect and overhaul all interior and exterior stair handholds and verify that all safety appliances meet all current FRA Safety Appliances regulations.

### 1.2.12 Diaphragms and Safety Curtains

Remove safety curtains and housings. The empty tapped holes in collision posts shall be filled with decorative buttons or pan head fasteners before repainting.

All diaphragms shall be renewed. In the Carbody Overall Overhaul Plan, the Contractor shall submit mounting overhaul and installation procedures approval.

## 1.3 REQUIRED CDRLS

101 Carbody Overall Overhaul Plan to the Administration for approval

102 Criteria for replacement of window glazing and replacement material specifications and designs

103 Submittal of design and installation procedures for stepwell surfaces

104 Submittal of design modification for trap door heater wiring

# SECTION 02

# TRUCKS AND SUSPENSION

# SECTION 02
# TRUCKS AND SUSPENSION

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# SECTION 02
# TRUCKS AND SUSPENSION

## 2.1 GENERAL SYSTEM DESCRIPTION

Existing trucks are four-wheel, steel fabricated, outboard frame, with roller bearings, currently qualified to run at all MARC operational speeds up to a maximum speed of 125 mph.

The truck frames and bolsters are made of low alloy high tensile steel plate. The car is supported by two air springs per truck. The air springs are located on top of the truck bolsters. Leveling valves are mounted under the car body with linkages connected to the bolsters. There is one leveling valve per truck. Primary suspension units are coil inner and outer spring sets, with the outer coil spring incased in rubber. There are four primary spring sets per truck. Primary springs are located between each of the axle journal bearing assemblies and the truck frame.

Journal bearings are Timken class F (AP) lubricated tapered roller bearings. All journal bearings include a 100-tooth gear wheel for magnetic speed sensors.

Each truck has four friction brake units with two friction rings mounted to each axle. A truck also has four tread brake units

## 2.2 OVERHAUL REQUIREMENTS

The trucks shall be overhauled per OEM procedures, qualifications, and criteria.

The contractor shall submit a Truck Overall Overhaul Plan to the Administration for review and approval. **[CDRL 201]** The plan shall include all procedures for repair and subsequent stress relieving of the truck frame. The Truck Overall Overhaul Plan shall include all procedures to repair welds and cracks. Cracks shall be unacceptable, regardless of size or location. All weld repairs shall be in accordance with OEM requirements and applicable AWS codes.

All parts of the trucks and related assemblies, not described herein, shall be thoroughly cleaned and overhauled. Trucks shall be re-assembled in accordance with OEM requirements and performance criteria.

Overhauled trucks shall be complete with all equipment. The Contractor shall furnish all labor and unless specified, all material required, including the repair and replacement of all damaged or missing parts.

All work performed on and material applied to, overhauled trucks shall be in compliance with the most recent release of the AAR Wheel and Axle Manual and the AAR Roller Bearing Manual, including all amendments.

Where specific work is required to be performed per items above, the work shall be performed in AAR certified facilities. The Contractor shall not be permitted to use alternative shops to perform the work without prior Administration approval.

## 2.3 RECONFIGURATION

The Contractor is responsible for ensuring the overhauled truck and suspension system configuration is in compliance with the latest OEM specifications and requirements. The Contractor shall revise the appropriate As-Built drawings and documentation (as required in TS TS Section 17, Management and Support Systems within this Specification) to ensure configuration control; and that the proper documentation reflects all changes made to the As-Built configuration. This may include, but is not limited to OEM equipment/components, design modifications/upgrades, and approved modification/upgrades performed during this overhaul.

## 2.4 SCOPE OF WORK

The truck system overhaul shall be in accordance with OEM requirements and performance criteria. All inspection; testing; assembly and disassembly; repair and/or replacement of components; and adjustment and lubrication, as applicable, shall be in strict compliance with the OEM recommendations.

### 2.4.1 Frame

Frames shall be abrasive blasted clean to bare metal, removing all corrosion, and then visually inspected for damage. Openings shall be masked to prevent damage from abrasive media. After inspection the frames shall be immediately painted in accordance with the OEM's process and paint specification.

Frames shall be magnafluxed per ASTM-E-709.

Frames shall be trimmed for proper alignment. Proper alignment is defined as the difference in diagonal measurements being less than 1/16 inch. Tram points shall be permanently identifiable.

Incorrect tram shall be corrected using industry accepted methods. Tram procedure(s) shall be submitted to the Administration for review and approval before any actual work.

All critical dimensions of each truck frame shall be measured and recorded. The recorded dimensions shall be included as part of the Car History Book.

Mounting holes shall be cleaned and repaired as required.

Threads in tapped holes shall be repaired as required.

Spring pockets or spring suspension counter bores and mounting holes requiring repair shall be built up with weld. Reamed holes and seats shall be restored.

Tramming marks shall be restored.

Center bearing pin bushing shall be renewed.

Side bearing friction plates shall be renewed in sets as specified by the OEM for MARC operational speeds. Side bearing friction plates shall be conditioned for coefficient of friction as specified by OEM using OEM recommended equipment. Appropriate shimming shall be applied or removed per OEM procedures for wheel diameter compensation.

Journal box hangers shall be removed, cleaned, inspected, and repaired if found damaged. If the journal box hanger is beyond repair, it shall be replaced.

Journal box hangers shall be returned to original truck position after overhaul or replacement.

Special care and inspection shall be given to the radius arm seat and bolt holes. Damaged seats and bolt holes shall be weld repaired and re-machined. As part of the Truck Overall Overhaul Plan, the Contractor shall develop a procedure to repair the welds, and re-machine the seats.

A. **Name and Number Plates.** Existing name plates shall be removed, cleaned, repainted and reapplied. Damaged or missing name plates shall be replaced.

   Existing number plates shall be removed, cleaned, repainted and reapplied. Damaged or missing number plates shall be replaced. Number plates shall be masked until all painting on the truck is completed.

B. **Radius Arm Caution Plate.** Four red "radius arm torque value" caution plates shall be applied to each truck after all painting on the truck is completed. The location of the Caution Plate shall be in accordance with OEM.

### 2.4.2 Bolster

Bolsters shall be abrasive blasted clean to bare metal, removing all corrosion, and then visually inspected for damage. Openings shall be masked to prevent damage from abrasive media. After inspection the frames shall be immediately painted in accordance with the OEM's process and paint specification provided in TS Section 3.11.2.

Bolsters shall undergo a dimensional measurement inspection. All results shall be measured and recorded. The recorded dimensions shall be included as part of the Car History Book.

Bolsters shall be magnafluxed per ASTM-E-709.

Bolsters shall receive a 100% magnetic particle inspection in all welds. All welds shall be of an acceptable quality otherwise subject to repair.

Any crack shall be unacceptable, regardless of size or location. All weld repairs shall be in accordance with AWS applicable codes.

All mounting holes shall be repaired as required.

Steel wear plates shall be inspected and repaired or replaced as necessary per the OEM procedures. Existing body side bearing plates may be re-machined flat removing a maximum of 0.125 inches of the original plate thickness. The stainless wear plates shall be re-welded to AWS procedures and sealed per OEM instructions. All welding processes shall be to OEM procedures and criteria and meet AWS standards.

Existing center casting portion of bolster and frame shall be overhauled to OEM dimensions.

Lateral Shock Absorber shall be replaced with OEM or Administration approved equivalent.

Replace lateral bumpers with OEM or Administration approved equivalent.

Hanger plates and pins shall be inspected for damage and repaired as required. Cotter pins shall be replaced.

### 2.4.3 Bolster Anchor Rods

Existing bolster anchor rod assemblies shall be overhauled. All bolster anchor rod rubbers are to be replaced if found worn, or damaged. Reinstall new rubbers per OEM procedures. Inspect bolster anchor rod for cracks, distortion, or other damage. Repair or replace damaged bolster anchor rods.

### 2.4.4 Radius Arms

The radius arm assembly shall be overhauled per OEM procedures. Note: the two halves of the radius arm are serialized. They two halves are match drilled as a set, and shall not be interchanged with halves from other radius arms.

Radius arm rubbers shall be replaced.

All cotter pins, nuts, and bolts shall be replaced.

The drilled bolt used in the attachment of the end cap to the radius rubber holder shall have a hole sufficient for the cotter pin and shall not affect the strength of the bolt.

Existing roller bearing seats of the radius arms shall be cleaned, inspected, and overhauled in accordance with the OEM recommendations.

### 2.4.5 Journal Bearings and Boxes

All journal bearings shall be removed and overhauled in accordance with OEM procedures and methods by an AAR certified facility. If the journal bearing cannot be re-conditioned it shall be renewed with an OEM bearing. **For estimating purposes, it is anticipated 5% of bearings shall be replaced.**

All bearings, whether new or rebuilt, shall be fully lubricated with grease meeting AAR specification M-942 latest revision. Bearings shall not require any field lubrication.

Lubricant fitting shall be removed and a plug applied in the axle end cap.

Toothed gear wheels for speed sensors shall be cleaned, inspected and repaired if damaged.

Bearings that are not needed to complete trucks shall be overhauled and returned to the Administration.

### 2.4.6 Wheels and Axles

All wheels shall be replaced with new wheels in accordance with the requirements of this section and in accordance with AAR Manual of Standards and Recommended Practices for Wheels and Axles, Section G.

New wheels shall be a nominal 36 inches in diameter, with flange angle and tread profile in accordance with APTA 340 (APTA SS-M-015-06), and conforming to AAR #B-36 heat treated wrought carbon steel, multiple wear type.

New wheels shall be manufactured to AAR Standards and shall conform to the current revisions of Title 49 CFR Part 238.119 and APTA SS-M-012-99, Standard for the Manufacture of Wrought Steel Wheels for Passenger Cars and Locomotives.

Wheels shall have undersize bores to permit maximum re-use of existing axles.

New wheel sets shall be grouped and applied in truck sets.

New Wheels shall be dynamically balanced to within 0.50 pounds-force (0.23 kg) at the outside diameter of the rim. Balancing shall be achieved by machining the wheel.

Detail drawings and specifications for the new wheels shall be submitted to the Administration for approval. **[CDRL 202]**

Journal seat repairs may be made by the electro-chemical deposition process if done within the scope of rule 2A-5 of the AAR Wheel and Axle Manual.

Reject Axles shall be replaced with new axles. **For estimating purposes, it is anticipated 12 axles will require replacement.**

Reject Axles shall be stored and protected until released for disposition by the Administration.

A permanent record shall be kept of all wheel pressings, serial numbers, axle stampings, tape sizes, tonnage and all other dimensions taken, including runout readings. The records shall be included in the car history book.

### 2.4.7 Suspension

A. **Primary Suspension.** The existing primary spring is a nested matched set of inner and outer coil springs. The outer coil spring is a rubber coated steel coil spring that has non-linear spring rate characteristics.

   Existing rubber coated coil springs shall be inspected for damage and replaced if bulged, torn, peeled, or cracked with OEM or Administration approved equivalent. Replacement springs shall meet the exact OEM specifications. Replacement primary springs shall be free issued by the Administration.

   During car leveling, primary spring empty weight installed heights shall be shimmed to OEM requirements using OEM procedures. All resulting measurements shall be recorded on forms and included as part of the Car History Book.

   Primary springs not meeting the installed measurement requirements shall be removed and replaced.

   Primary springs shall have markings indicating the manufacturer and date of manufacture on outside surface of one end of each rubber coated spring coil.

   An OEM or Administration approved equivalent design top cap shall be placed on the truck frame hole above the primary spring to prevent debris entering the seat and spring assembly. The top cap shall not be easily removed by hand.

B. **Secondary Suspension.** Existing air springs shall be inspected for damage and replaced in accordance with OEM procedures and criteria.

   1. The Administration shall free issue replacement air springs to the Contractor.
   2. O-rings shall be replaced when replacing air springs.
   3. Existing air spring adapter plates shall be overhauled.
   4. All air suspension hoses shall be replaced.

C. **Leveling Valves, Compensating Valves, and Double Check Valve.** See Air Brake TS Section 4 for secondary suspension leveling valves and associated pneumatic components.

### 2.4.8 Electrical, Electrical Conduit, and Piping

Any PTC related truck equipment including speed sensors, axle generators associated wiring and junction boxes shall be overhauled. The MTA does not expect replacement of any PTC related equipment.

A. **Electrical Conduit.** Existing conduits, junction boxes and fittings shall be removed and inspected. Any damaged parts shall be replaced with new OEM material.

   Terminals, cables, and connectors shall be cleaned and inspected. Any damaged parts shall be replaced with new OEM material.

   All magnetic speed sensor cables shall include the following:

   1. All speed sensor and cable assemblies shall have a fixed pigtail with integral environmentally sealed connection at the sensor.
   2. New cable clamps shall be installed to securely retain the cable arrangement on the truck frame.
   3. Cable clamps and cable routing shall be arranged to permit the full range of truck rotation relative to the carbody and maximum dynamic vertical displacement of the journal boxes relative to the truck frame.
   4. The cable shall have a quick disconnect, Canon style plug connector. The proposed speed sensor cables and installation shall be submitted for Administration review and approval. **[CDRL 203]**

B. **Air Piping.** Existing air piping shall be cleaned inside and outside and capped to prevent contamination from entering. Any damaged, bent, dented air piping shall be replaced. Replacement piping shall be seamless steel tubing per ASTM A53 SEAMLESS GRADE B.

   Pipe clamps, fittings and unions shall be cleaned and overhauled. If any part cannot be repaired it shall be replaced.

   All air leaks shall be repaired.

### 2.4.9 Brake Equipment

Brake equipment overhaul including the removal of the sanding system shall be covered in Air Brake TS Section 4.

### 2.4.10 Electrical Grounding

Axle end grounding contacts shall be renewed. Carbon brushes shall be renewed. Spring supports shall be renewed. Sealing O-ring shall be renewed.

All ground straps and their fasteners shall be replaced with OEM material. Appropriate conductive grease shall be applied at all bolted connections.

### 2.4.11 Painting

Before re-assembly of the truck, one coat of approved metal primer shall be applied to all individual metal parts.

A final coat of approved silver enamel truck paint shall be applied. The paint shall not conceal cracks that may develop in service. Care shall be taken to mask off areas of the radius arm seat from paint. The proposed paint shall be subject to Administration approval.

Wheels, axles, exposed rubber and name/number plates shall not be painted.

### 2.4.12 Lubrication

All truck, handbrake and air brake components requiring lubrication shall be lubricated before shipment of cars.

Truck parts shall not be lubricated during truck assembly.

Journal bearings are to be lubricated by the AAR certified roller bearing repair shop.

### 2.4.13 Carbody Leveling

Leveling the trucks and carbody shall be done on straight, level, tangent track. The track shall be solidly supported with the top elevation of the track maintained within 0.125 inches tolerance at all truck and wheel centers.

The Contractor shall submit the car leveling procedures for Administration review and approval **[CDRL 204].**

## 2.5 SPARE TRUCKS

The Administration has eight (8) spare truck assemblies (truck frame and bolster) that shall be part of this scope of work. The Contractor shall build complete, ready to run truck assemblies with those components. The spare trucks shall be capable of MARC operational speeds, using the procedures and required processes as identified this Specification.

The Contractor shall be responsible for providing all missing material to produce complete ready-to-run truck assemblies, including but not limited to, wheels, axles, roller bearings, brake equipment, brake actuators, piping, wiring, primary springs, elastomeric elements and air springs.

Spare trucks shall be used as floats and installed on completed cars during the course of this project.

## 2.6 REQUIRED CDRLS

201 The contractor shall submit a Truck Overhaul Plan.

202 Detail drawings and specifications of the proposed new wheel replacements.

203 The proposed speed sensor cable and installation.

204 The Contractor shall submit the car leveling procedures.

# SECTION 04
# AIR BRAKE

# SECTION 04
# AIR BRAKE

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# SECTION 04
# AIR BRAKE

## 4.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with a brake system built around basic WABCO 26-C Type Brake System equipment. The Cab Control cars are also equipped with a 26-C Cab Control Unit and 26-C brake valve for manual control of the trainlined brake pipe pressure in the consist. The normal operation of the train's brake system is a locomotive equipped with 26-L brake valve or from a Cab Control car equipped with a 26-C brake valve.
The brake system includes a cable operated handbrake which activates the brake on two disc brake units per car.

The brake system includes a load sensing feature, which reads the car's air spring pressure, and modulates maximum brake cylinder pressure in both service and emergency braking in order to keep braking demand within normal adhesion limits, and to achieve the specified braking rates. Cab Control cars are equipped with a sanding system which applies sand to both rails at the wheels on the lead axle No. 1 of the F-end. Sanding is automatically controlled by the Forward/Reverse key on the master controller so that sand is always delivered ahead of the leading wheels of the train. Sand application is inhibited on the Cab Control car when the locomotive is forward.

The brake system includes WABCO E-7 DECELOSTAT wheel slide detection and correction equipment that shall keep the braking rate as nearly constant as is physically possible under varying adhesion conditions.

### 4.1.1 Performance Requirements

The existing car performance is and shall remain as follows, after the overhaul:

**A.** **<u>System Pressure</u>**: The maximum design pressures for the air brake system are:
Main Reservoir: 150 psi (1034 kPa) with the locomotive governor set at 125 to 140 psi (861 to 965 kPa)
Brake Pipe: 110 psi (758 kPa)
Max. Brake Cylinder: l00 psi (689 kPa)

**B.** **<u>Deceleration Rates:</u>**
The brake system shall be overhauled so that the original As-Built deceleration rates are achieved. An average full service brake deceleration rate of 2.00 mphps (0.89 $m/s^2$) shall be achieved from stops initiated at all speeds up to 125 mph (202 km/h).

The maximum instantaneous car deceleration rate during the full service stop shall not exceed 2.75 mphps (1.23 $m/s^2$). The maximum change in service brake deceleration (Jerk Rate) during service brake application shall not exceed 1.5 mphpsps (0.67 $m/s^3$).

In addition to achieving the deceleration rates as specified above, the brake system shall produce a maximum single car deceleration rate of 2.50 mphps (1.12 $m/s^2$) during emergency brake applications.

The Contractor shall verify by testing the overhauled air brake equipment by performing a type tests and routine tests as required in TS Section 14. The Contractor shall provide a test plan for Administration review and approval per TS Section 14.

System responses and results shall meet the Specification values for all weather conditions. Rail conditions may be taken into account by the Administration on a case by case basis during adverse weather.

Braking shall be considered to have begun at the instant of brake handle movement. The train shall be considered stopped upon energization of the zero speed relay.

## 4.2 OVERHAUL REQUIREMENTS

The Contractor shall submit an Air Brake Overall Overhaul Plan to the Administration for approval **[CDRL 401].** The plan shall include all cleaning, inspection, repair, and testing procedures. In general, the brake system shall be overhauled per OEM heavy repair maintenance requirements. Overhauling requirements are discussed in the sections below including; base scope of work, modifications, additions and options.

An option to replace the WABCO E-7 DECELOSTAT system with a KNORR MGS2 wheel slide control system is further discussed below.

The entire brake system shall be overhauled to comply with all applicable requirements of 49 CFR 238.231 and facilitate performance of the APTA approved Single Car Test, 49 CFR 238.311 and Class I Brake Test defined in 49 CFR 238.313. The entire brake system shall be inspected and tested as required by 49 CFR 229.25, 229.27, 229.31 and 229.29 and 49 CFR 238.309. In addition, Form FRA 6180-49A shall be updated.

## 4.3 RECONFIGURATION

The Contractor is responsible for ensuring the overhauled air brake system configuration is in compliance with the latest OEM specifications and requirements. The Contractor shall revise

the appropriate As-Built drawings and documentation (as required in TS Section 17, Management and Support Systems within this Specification) to ensure configuration control; and that the proper documentation reflects all changes made to the As-Built configuration. This may include, but is not limited to OEM equipment/components, design modifications/upgrades, and approved modification/upgrades performed during this overhaul.

## 4.4 SCOPE OF WORK

The following existing air brake system components and associated air system components shall be removed from the vehicles, overhauled, and reinstalled per OEM procedures and recommendations: The Original Equipment Manufacturer (OEM) of the existing air brake system is WABCO (now named Wabtec Corporation, Passenger Transit). The air brake system shall be tested in accordance with TS Section 14.

- **A.** D-7 Operating Unit – including all control portions, valves, cocks, filters, and pressure switches.
- **B.** The 26-C Cab Control Unit – including the 26-C Brake Valve portion and all control portions, valves, and electrical devises.
- **C.** Laminated brake pipe manifolds
- **D.** B-3-B Emergency Brake Valves
- **E.** VX Vent Valves
- **F.** A-1 Charging Valve
- **G.** E-3 Brake Application Valves
- **H.** N-1-D Magnet Valves
- **I.** Air Filters and Air Filters with Choke
- **J.** H-5 and HB-5 RELAYAIR Valves
- **K.** N-3-E Magnet Valve
- **L.** Filters, Strainers and Check Valve
- **M.** Check Valves and Check Valves with Choke
- **N.** Air Suspension Double Check Valves
- **O.** Air Suspension Compensating Valves
- **P.** Air Suspension Leveling Valves
- **Q.** Horn Valve (Cab Control Cars)

All component identification labels or decals shall be cleaned or renewed.

### 4.4.1 WABCO E-7 Decelostat

The existing WABCO E-7 DECELOSTAT, wheel slip-slide detection and correction controller located in the Electric Locker shall be replaced with a KNORR MGS2 system or Administration approved equivalent.

Slide detection and correction shall be independent of load condition AW0 through AW3.

Slide detection shall be performed on all four axles and corrections made on a per truck basis.

The contractor shall propose compatible magnetic speed sensors to replace the existing units. The contractor shall use the existing axle mounted interfaces and toothed gear wheels.

All speed sensors, connectors, and cable assemblies shall be sealed to prevent water intrusion and shall. Speed sensors shall comply with the requirements of TS Section 2.4.8.

The Contractor shall submit the details of the slip-slide correction system with all electrical and pneumatic system schematics, component drawings and specifications, interfaces, software documentation, and testing for review and approval of the Administration. **[CDRL 404]**.

### 4.4.2 Reservoirs

Main and supply reservoirs shall be inspected and tested in accordance with 49 CFR 229.31. All other reservoirs, including equalizing and combined reservoirs shall be inspected and tested in accordance with ASME's Boiler and Pressure Vessel Code.

Failed reservoirs shall be replaced with new reservoirs.

Successfully tested reservoirs shall have the exteriors primed and painted and stenciled with white letters and numerals. The interiors shall be cleaned and de-scaled.

Drain valves shall be inspected, tested, and overhauled, or replaced.

Automatic drain valves shall be inspected, tested, and overhauled or replaced.

Any replacement air reservoirs shall be pressure vessels conforming to the latest revision of ASME Boiler and Pressure Vessel Code, as required in TS Section 15. Main and supply reservoirs shall include telltale holes, as called out in 49 CFR 229.31(c). Test reports and certification for each pressure vessel shall be included in the Car History Book.

### 4.4.3 Truck Mounted Brake Units

Tread brake units shall be overhauled per OEM specifications. Mechanical linkages shall be renewed per OEM specifications.

Disc brake calipers units shall be overhauled per OEM specifications. Mechanical linkages shall be overhauled per OEM specifications.

Disc brake friction rings shall be replaced with OEM friction rings or Administration approved equivalent. Friction ring mounting hubs shall be visually inspected for cracks or other damage and shall be replaced if found to be damaged.

All tread brake shoes and disk brake pads shall be renewed.

### 4.4.4 Pipe Work, Hoses, and Pneumatic Components

The following existing air brake components shall be removed from the vehicles, overhauled per OEM procedures and reinstalled:

- **A.** Brake Cylinder Pressure Switches
- **B.** Duplex Air Gages
- **C.** All Cutout Cocks
- **D.** All Drain Cutout Cocks
- **E.** All Angled Cocks
- **F.** All Cutout Cocks with Locking Handles and Vents
- **G.** Car end brake pipe and main reservoir pipe cutout cocks are ball type with locking handles and shall be overhauled per OEM specifications or renewed.
- **H.** Cutout cocks to the brake cylinder pipe on each truck shall be overhauled per OEM specifications or renewed.
- **I.** Cutout cocks to other air operated equipment shall be overhauled per OEM specifications or renewed.
- **J.** Renew existing end of car brake pipe angle cocks and main reservoir cutout cocks.
- **K.** All pneumatic brake indicators shall be overhauled including, hoses, air cylinder, fittings, seals, and colored plunger end.
- **L.** All existing steel pipe shall be thoroughly flushed and cleaned and inspected. All steel piping shall be dried and capped to prevent the infiltration of moisture or debris. All missing pipe clamps shall be renewed. Air piping shall be tested in accordance with TS Section 14 requirements.
- **M.** All copper lines and fittings shall be thoroughly flushed and cleaned and inspected. All copper lines shall be dried and capped to prevent the infiltration of moisture or debris. All missing pipe clamps shall be renewed.
- **N.** All hoses shall be renewed and dated no less than one year prior to acceptance. Brake pipe trainline hose connections shall be in accordance with AAR Specification M-601, latest revision and shall be less than one (1) year old from date of manufacture at the time of delivery of car to MARC.
- **O.** Main reservoir trainline connections and any other air system hoses shall be a wire reinforced type in accordance with AAR Specification M-618, latest revision and shall be less than one (1) year old from date of manufacture at time of delivery of car to the Administration.
- **P.** All brake pipe welding repairs shall be done in accordance with AAR S-402. Prior to the installation of any valves, after welding and assembly, all piping shall be blown clean while being mechanically excited by shaking in accordance with AAR S-402. The pipe system, including hoses and couplings, shall then be charged to not less than 125% of the working pressure and all pipe joints or fittings shall be tested with a soap solution. All air leaks shall be corrected and retested before any further

assembly is performed. Maximum leakage allowable shall be 5 psi in 10 minutes following a 5 minute settlement period.

**Q.** Brake pipe installation, access for maintenance, and fittings shall comply with Part E of the AAR Manual of Standards and Recommended Practices.

**R.** All pneumatic test fittings shall be inspected, overhauled or replaced.

Air pipe system from the main reservoirs utilized for auxiliary functions in addition to the brake system shall be included in the overhauling.

### 4.4.5 Handbrake

The handbrake system shall be overhauled per OEM procedures. All linkages, bushings, and pins shall be renewed. The hand lever shall be overhauled, cleaned, and painted.

Parking brake cables to the disc brake actuators shall be renewed with new cables. **As an OPTION**, a new cable design having demonstrated reliability and durability, and shall be submitted to the Administration for review and approval **[CDRL 402]**.

Parking brake chains shall be evaluated for wear, cleaned, or replaced.

The parking brake electrical micro-switch and wiring shall be overhauled, or replaced.

All rubber seals and gaskets shall be renewed.

Securely mounted padding material provided to shield chain weights from car structure and vestibule equipment shall be renewed per OEM.

## 4.5 SANDING SYSTEM REMOVAL

The Contractor shall submit a procedure for the removal of the sanding system for Administration approval. **[CDRL 403]** Both sand boxes shall be removed from each Control Cab car F-end. The existing sanding magnet vales shall be removed. The existing sand traps, sanding nozzles and hoses shall be removed. All carbody air pipe ends shall be plugged with the appropriate pipe plugs and shall be leak proof.

### 4.5.1 Sanding Controls

The ability to command sand from the control cab to the locomotive sanders shall remain. The sanding control to the Control Cab car sanders shall be disabled.

The sanding selector toggle switch (forward or reverse) on the cab console switch panel shall be removed.

The non-latching "wobble" manual sanding switch on the cab control console to manually control sanding on the locomotive shall be renewed.

The indicator light on the cab console switch panel that illuminates when the locomotive or car is calling for sanding shall be renewed.

## 4.6 REQUIRED CDRLS

401 The Air Brake Overall Overhaul Plan shall be submitted to the Administration for approval.

402 An optional new parking brake cable design shall be submitted to the Administration for review and approval.

403 The Contractor shall submit a procedure for the removal of the sanding system for Administration approval.

404 The Contractor shall submit the details of the replacement slip-slide system for review and approval of the Administration.

# SECTION 05
# ELECTRICAL

# SECTION 05
# ELECTRICAL SYSTEM

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# SECTION 05
# ELECTRICAL

## 5.1 GENERAL SYSTEM DESCRIPTION

This section describes the various pieces of existing and new apparatus, panels and switches that perform the required electrical functions on the car.

The electrical system comprises both the low voltage and high voltage power distribution and control components. The high voltage power system is at a nominal 480 VAC and receives power from the locomotive. The high voltage system supplies power to the HVAC heaters and compressor, blower motors, and transformers. The vehicle provides auxiliary power at a nominal 120VAC. The low voltage system is at a nominal 74 VDC and receives power from the vehicle's battery charger and from the storage batteries. The low voltage system supplies power to systems, which include doors, lights, HVAC, and brakes.

**Vehicle Voltages**

The vehicles have three distinct voltage systems, as follows:

A. 74 VDC battery (64 VDC, nominal) – derived from the 480 VAC buss through a LVPS/BC or transformer rectifier and typically used for "local" vehicle control and car function DC trainline commands.

B. 120 VAC, 60 Hz – derived from the 480 VAC HEP trainline buss through isolation transformers and typically used for low voltage functions such as lighting, convenience outlets and HVAC controls.

C. 480 VAC 60 Hz – HEP trainline power obtained from the powering locomotive and typically used for HVAC power, floor heat and is the source for the 74 VDC and 120 VAC circuits. Single phase, phase reversal, and ground fault protection is not currently provided on each car. The Contractor shall add these features to the 480 VAC system

Locomotive Supplied HEP Power Quality:

A. The HEP power supplied by the MARC diesel locomotive fleet is generated by an independent diesel engine-alternator package producing 3-phase, 480 VAC, 60 Hz power with 1% THD (Max), over a voltage and frequency range of 475-485 VAC and 59-61 Hz, respectively.

B. The HEP power supplied by the MARC electric locomotive fleet is generated by a static inverter package (GTO or IGBT) producing 3-phase, 480 VAC, 60 Hz power with 5% THD (Max), over a voltage and frequency range of 470-490 VAC and 59-61 Hz, respectively.

C. Any new component applied to the vehicle systems shall be designed to use this type of power.

## 5.2 OVERHAUL REQUIREMENTS

The overhaul requirements are discussed in the sections below; base scope of work, modifications, additions and options are also discussed in sections below. The Contractor shall submit an Electrical Overall Overhaul Plan for the electrical system inspection, and testing to the Administration for approval. **[CDRL 501]**

In general, the Contractor shall overhaul the electrical system per OEM specifications and requirements.

### 5.2.1 Switch and Circuit Breaker Panel and Compartment

All switch and circuit breaker panels and compartments shall be cleaned, inspected and overhauled.

All switches shall be inspected and tested. Any device not functioning in accordance with its intended purpose shall be renewed with OEM material.

All circuit breakers shall be inspected and tested. All circuit breakers' thermal and magnetic trip overload protection portions shall be inspected and tested. Any device not functioning in accordance with its intended purpose shall be renewed. The Contractor shall estimate that five (5) DC and five (5) AC circuit breakers will need to be renewed on a per car basis.

All wiring on the panels shall be inspected for damage (burns, pinch points, broken conductors, splices, etc.) and renewed.

All broken or illegible nameplates shall be renewed.

All panel wiring shall meet all recommendations of APTA RP-E-002 (latest revision).

All new circuit breakers shall be sized in accordance with NEC requirements.

### 5.2.2 Auxiliary Transformer

All auxiliary transformers shall be cleaned, inspected and tested.

All transformer installation brackets shall be cleaned, inspected and overhauled.

Any defective transformer shall be renewed. The Contractor shall estimate that ten (10) transformers will need to be renewed on a per fleet basis.

### 5.2.3 Convenience Outlets

All outlets shall be replaced and shall have stainless steel covers plates.

The outlets shall meet all requirements of the latest revision of Section 4.6 in APTA SS-E-005 (latest revision) and IEEE Std. 16.

Wiring shall be installed by the Contractor to accommodate any new GFI outlet circuits.

The convenience outlets boxes shall be cleaned, inspected, and renewed.

All outlet wiring shall be inspected for damage. All damaged wiring shall be renewed.

**As an OPTION,** the Contractor shall provide a proposal to the Administration, with a cost and design concept for installation of a GFI protected duplex or strip electrical outlet at each seat location. **[CDRL 502]**

At a minimum, the Contractor's design concept shall show the outlet's location at the seat (side wall or seat pedestal); different seats may require different installation locations.

The Contractor shall also provide an estimate of the vehicle's increased power demand, (assume 50% usage by a laptop PC at each seat row)

### 5.2.4 74 VDC Low Voltage System

**A**. **Batteries.** The batteries shall be cleaned, inspected and tested to the OEM procedures.

Batteries shall be renewed if they are two (2) years or older than from the Contract Award date or having fail the OEM testing requirements. The Contractor shall estimate that ten (10) car set of batteries will need to be renewed on a per fleet basis.

All batteries shall be charged in accordance with the OEM's procedures before the vehicles are shipped back to the Administration**.**

**B. Battery Boxes and Trays.** All battery boxes shall be cleaned, inspected and repaired as necessary.

All battery box hinges and latches shall be cleaned, inspected and lubricated. If any latch is found to be defective it shall be renewed.

All battery trays shall be cleaned and inspected and repaired as necessary.

All battery tray roll-out mechanisms shall be renewed.

All battery inter-cell cables shall be renewed.

The vehicle battery leads within the battery box shall be inspected for damage and renewed as necessary. These leads shall be properly supported at the rear of the battery box so as not to be pinched between the battery box rear wall and the battery tray frame.

**C. Low Voltage Power Supply/Battery Charger.** All LVPS/BC's shall be removed from the vehicles and returned to the product OEM for re-qualification and or repair.

The LVPS/BC OEM manufacturer shall renew all electrolytic capacitors and fuses.

The OEM shall perform a dielectric test on the transformer and filter inductor. Any transformer or inductor that fails shall be renewed.

### 5.2.5 Relays, Contactors and Other Components

All relay and contactors shall be cleaned, inspected and tested to ensure functionality at the device's nominal operating voltage.

All contactors, transfer switches, etc., with renewable contact tip shall have them renewed.

All discrete passive devices (isolation diodes, resistors, MOVs, free-wheeling diodes, capacitors, etc.) shall be renewed.

Any damaged or failed components shall be renewed. See any additional requirements as noted in TS Section 15.

All magnet valves and pressure switches shall be renewed. See any additional requirements as noted in TS Section 04.

All cab signal/ATC axle generators shall be replaced with new PHW cab signal/ATC axle generators with a minimum of two (2) speed sensors. The Contractor shall install any additional wiring that may be required.

All end-of-axle ground brush assemblies shall be renewed. All ground straps and cables shall be renewed. This includes but is not limited to the following:

A. Carbody-truck frame;

B. Truck frame –bolster;

C. Truck frame-journal box;

D. Journal box-axle ground brush.

All indication light circuits actuated by means of a micro-switch (hand brake and Toilet Occupied) shall be cleaned, inspected and tested. Any failed component shall be renewed.

All bells, alarms and buzzers throughout all vehicle types shall be replaced.

All hand dryers in the toilet compartment shall be replaced with Excel "XLERATOR" Model XL-SB hand dryers.

All trap door heating elements and wiring shall be renewed back to each door location's junction box.

### 5.2.6 Wire and Cable

All wire and cable used by the Contractor shall conform to the requirements of TS Section 15.

### 5.2.7 Electro-Magnetic Compatibility (EMC)

The Contractor shall follow the EMC requirements provided in TS Section 0.10.

### 5.2.8 Terminal Strips

All terminal strips shall be cleaned and inspected.

Damaged or deteriorated terminal strips and device identification labels shall be renewed.

Replacement terminal strips shall be revenue service-proven and comply with all recommendations of the latest revision of Section 4.6 in APTA RP-E-002 (latest revision).

Illegible terminal strip markings and device identification labels shall be renewed.

### 5.2.9 Trainlines (Reference Tables T 05-1 and T 05-2)

**A. <u>Locomotive Control.</u>** The two (2) BLACK MU Control receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle assemblies shall be Clement National CRA-27180-MU-BK or approved equal. Receptacle covers shall be marked with 1 inch white stencil lettering, "MU". New OEM wire markers shall be applied when the MU trainlines wires are re-terminated in the trainline junction boxes

The two (2) YELLOW MU DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-MU-Y or approved equal. Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY"

One (1) new BLACK MU trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-MU-BK or approved equal.

**B. <u>Door and Communication.</u>** The two (2) BLUE COMM receptacles and wiring back to the trainline junction box shall be renewed. The MU receptacle assemblies shall be Clement National CRA-27180-AMTK or approved equal. Receptacle covers shall be marked with 1 inch white stencil lettering, "COMM". New OEM wire markers shall be applied when the COMM trainlines wires are re-terminated with OEM terminals in the trainline junction boxes.

The two (2) WHITE COMM DUMMY receptacles shall be renewed. The DUMMY receptacle shall be Clement National CRA-AMTK-W or approved equal. Receptacle covers shall be marked with 1 inch black stencil lettering, "DUMMY".

One (1) new BLUE COMM trainline jumper cable shall be provided with each car. The jumper cable shall be Clement National CPA-2760-AMTK or approved equal.

**C. <u>Head End Power.</u>** The four (4) fixed Head End Power (HEP) single ended trainline jumpers shall be renewed. The HEP jumper assemblies shall be Clement National MPA-1SR-0128 or approved equal and shall be colored RED.

The four (4) HEP receptacle housings shall be inspected, cleaned and repaired as needed. The HEP receptacles are the locking type, Clement National MRA-BH or approved equal and shall be colored RED.

The four (4) HEP receptacle assembly inserts shall be renewed. The HEP receptacle inserts shall be Clement National MRA-1-0077 or approved equal and shall be colored RED.

The HEP cable pigtails shall be long enough to be spliced back into the carbody mounted HEP cabling behind the step wells; these splices are the only ones permitted on the vehicles.

1. The splices shall use a two (2) bolt connection covered with two layers of heat-shrink tubing with sealant.

2. A new protective rubber sleeve tube from PowerRail Distribution Inc., (p/n E8350968) shall then be applied over each splice which will be secured at each end by means of an appropriate diameter stainless steel hose clamp.

New "DANGER 480 VOLT" decals shall be applied adjacent to the HEP receptacles and jumper assemblies, in the same location as originally installed.

The Phase rotation of the 480 VAC cabling on the cars shall be maintained. It shall be 1 – 2 – 3 in the counter-clockwise direction when looking into the MALE HEP receptacle on either end of the car.

For HEP load balancing, within the HEP trainline junction box, the HEP phases will be rotated by one phase going to the F/B-end of the car, i.e. P1 to P2, P2 to P3 and P3 to P1

When the HEP cabling is re-terminated using OEM terminals at the HEP junction boxes, new OEM style wire markers and heat shrink Phase Color Coding bands shall be applied. The color coding of the HEP cables for each phase, 1, 2, and 3 shall be determined during the design reviews.

The HEP Trainline Control wiring shall only use Pin 1 from end to end for the Trainline Complete Circuit. Within the MU and COMM trainline junction boxes, HEP Control Pins 2 and 3 shall be grounded coming from the carbody receptacle and jumper end, and shall not be connected coming from the opposite end of the car's MU and COMM junction boxes.

### 5.2.10 Junction Boxes

All junction boxes (exterior and interior) shall be cleaned and inspected.

Any interior paint which is damaged shall be repaired with an Administration approved WHITE insulating paint. Exterior paint shall be repaired as appropriate.

All box cover gaskets shall be renewed.

All box cover fasteners and hardware shall be renewed.

### 5.2.11 Trainline Wiring

All exposed trainline wiring (including the 480 VAC HEP cabling run in the undercar wire trays) shall be cleaned and inspected for damage. Any damaged or previously repaired wire or cabling shall be renewed. Splices are prohibited.

All trainline wiring (MU, COMM and HEP) shall be tested for grounds. All trainline wiring shall have an insulation resistance to ground tested as per the requirements of APTA SS-E-001. Any wiring not having this level of insulation resistance shall be renewed.

Continuity tests shall be performed on every car, after completion of assembly and equipment installation, to confirm that:

A. Continuity exists between all intended contacts of all receptacles;

B. Continuity exists between trainlines and each vehicle connection to the trainline circuit;

C. Continuity exists from one end to the other of all spare wires;

D. No wires are unintentionally grounded (this includes spares);

E. No wires are shorted or cross connected to unintended circuit.

Each conductor of each trainline shall be exercised to ensure the equipment to which it is connected transmits/receives the trainline signal correctly.

| Pin F/B-End | Pin A-End | Function | Marker | Size AWG No. |
|---|---|---|---|---|
| 1 | 1 | 11kV-25Hz (Tap Changer) | 1T | 12 |
| 2 | 2 | Alarm (SG) | 2T | 12 |
| 3 | 3 | D Valve-Engine Speed (DV) | 3T | 12 |
| 4 | 4 | Negative (N) | 4T | 10 |
| 5 | 5 | Emergency Sand (ES) | 5T | 12 |
| 6 | 6 | Generator Field (Motor Control) (GF) | 6T | 12 |
| 7 | 7 | C Valve-Engine Speed (CV) | 7T | 12 |
| 9 | 8 | Forward (FO) | 8T | 12 |
| 8 | 9 | Reverse (RE) | 9T | 12 |
| 10 | 10 | Wheel Slip (WS) | 10T | 12 |
| 11 | 11 | Auto Power Reduction | 11T | 12 |
| 12 | 12 | B-Valve-Engine Speed (BV) | 12T | 12 |
| 13 | 13 | Positive (PC) | 13T | 10 |
| 14 | 14 | Pantograph DOWN / Fuel Pump | 14T | 12 |
| 15 | 15 | A Valve-Engine Speed (AV) | 15T | 12 |
| 16 | 16 | Engine Run (ER) | 16T | 12 |
| 17 | 17 | SPARE | 17T | 12 |
| 18 | 18 | 25kV-60Hz (Tap Changer) | 18T | 12 |
| 19 | 19 | Traction Motor Excessive Current Indication | 19T | 12 |
| 20 | 20 | Dynamic Brake Warning (Diesel) | 20T | 12 |
| 21 | 21 | SPARE | 21T | 12 |
| 22 | 22 | SPARE | 22T | 12 |
| 23 | 23 | Manual Sand (SA) | 23T | 12 |
| 24 | 24 | SPARE | 24T | 12 |
| 25 | 25 | SPARE | 25T | 10 |
| 26 | 26 | Fault Reset | 26T | 12 |
| 27 | 27 | No Power Brake Indication | 27T | 12 |

NOTE:

1. Wire crossovers (8/9) are to be made at F/B-End of car.

**TABLE T 05-1**

**Locomotive MU Control Train Line**

**Pin Assignments, Wire Markers, and Wire Sizes**

| Pin F/B-End | Pin A-End | Function | Marker | Size AWG No. |
|---|---|---|---|---|
| 1 | 1 | PA Wire SHIELD | PAS | 12 |
| 2 | 2 | Car Battery NEGATIVE | TB | 10 |
| 3 | 3 | PA Audio | PA1 | 14 |
| 4 | 4 | PA Audio | PA2 | 14 |
| 5 | 5 | IC Audio | PA3 | 14 |
| 6 | 6 | IC Audio | PA4 | 14 |
| 7 | 7 | PA Control | PA5 | 14 |
| 8 | 8 | PA Control | PA6 | 14 |
| 9 | 9 | Radio | VC1 | 14 |
| 10 | 10 | Radio | VC2 | 14 |
| 11 | 11 | SP-1 (EP Brake Application - Future) | SP1 | 12 |
| 12 | 12 | SP-2 (EP Brake Release - Future) | SP2 | 12 |
| 13 | 13 | Emergency Brake | EB | 12 |
| 15 | 14 | Door Control Right OPEN | D1 | 12 |
| 14 | 15 | Door Control Left OPEN | D2 | 12 |
| 17 | 16 | Door Control Right CLOSE | D3 | 12 |
| 16 | 17 | Door Control Left CLOSE | D4 | 12 |
| 23 | 18 | Engineer's Door CLOSED Light | DC1A | 12 |
| 19 | 19 | Handbrake Release Light | BRB | 12 |
| 20 | 20 | Engineer's Brake Applied Light | BAB | 12 |
| 21 | 21 | Door Override | DOR | 12 |
| 22 | 22 | Conductor's Door Signal Buzzer | CS | 12 |
| 18 | 23 | Conductor's Door CLOSE Light | DC2A | 12 |
| 24 | 24 | Trainline Information System | ER1 | 14 |
| 25 | 25 | Trainline Information System | ER2 | 14 |
| 26 | 26 | Conductor's Door CLOSE Light | BLS | 12 |
| 27 | 27 | No Motion | ZS | 12 |

NOTE:

1. Wire crossovers (14/15, 16/17 and 18/23) are to be made at F/B-end of the car.
2. Shield terminations are to be made at the F/B-end of the car.
3. Wires 3&4, 5&6, 7&8, 9&10 and 24&25 are to be 2-conductor, Twisted-Shielded Pairs.
4. Wires 11 and 12 are provisions for FUTURE conversion to EP Brake.

**TABLE T 05-2**

**Door & Communication Control Train Line**

**Pin Assignments, Wire Markers, and Wire Sizes**

## 5.3 REQUIRED CDRLs

501 The Contractor shall submit an Electrical Overall Overhaul Plan to the Administration for approval.

502 The Contractor shall provide a proposal to the Administration, with a cost and design concept for installation of duplex or strip electrical outlet at each seat location.

# SECTION 09
# DOOR AND DOOR CONTROL

# SECTION 09
# DOOR AND DOOR CONTROL

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# SECTION 09
# DOOR AND DOOR CONTROL

## 9.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with side doors, end doors and vestibule doors. The side doors utilize existing door operators with controls at each door and in the cab. The non-cab and cab end doors are fully mechanical and are equipped with locking mechanisms. The vestibule doors are electrically powered by an overhead door operator and will have a proposed alternate design using linear motor technology or permanent magnet type motor technology and microprocessor control.

## 9.2 OVERHAUL REQUIREMENTS

The Contractor is responsible to conduct a complete overhaul of the doors and door control systems. The objective of this overhaul is to repair, replace or reconfigure components in order to return the cars to their as built configuration and functionality. The door control system may have been modified by running repairs during the service life of the vehicles and it is the Contractor's responsibility to obtain the complete door control system specification and overhaul requirements from the OEM.

A Door and Door Control Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul. **[CDRL 901]** All components of the door system shall be overhauled to return them to their as-built OEM condition. All enclosures and equipment areas shall be cleaned and returned to OEM condition.

All doors and door control systems shall be tested to verify the function of the door control system in both the signal car and multiple car configurations as specified in TS Section 14, Testing and OEM procedures.

All equipment shall retain the OEM equipment label or may be renewed in kind retaining the OEM information. All wiring removed during the overhaul of equipment shall be tagged for identification during re-installation of the equipment. All wiring and wire terminations shall be inspected and replaced as needed. Wire terminations shall be properly torqued to OEM specifications during re-installation of the equipment. All new components and wiring shall be labeled and identified in accordance with the OEM schematic diagrams format.

The Contractor shall be responsible for all proper interfaces and functionality of the entire door system.

This plan shall name all subcontractors performing overhaul work on the Doors and Door Controls, including their scope of work, and it shall provide recommendations to control overhaul cost and the basis for the necessary component replacement.

All inspections are to follow APTA RP-I&M-003-98, Rev 1 "Recommended Practice for Door System Periodic Inspection and Maintenance," and based on the OEM manuals. All work shall be performed to the OEM Criteria and comply with the Materials, Workmanship and Standards TS Section 15 of this Specification.

Any reconfiguration of the Door Control equipment must be presented to the Administration for review and approval prior to the start of the overhaul.

## 9.3 SCOPE OF WORK

All overhauled, refurbished or replaced door and door control components shall meet the requirement and performance criteria of the OEM. All work shall be conducted in strict compliance with the OEM requirements and recommendations. All procedures shall be included in the Door and Door Control Overall Overhaul Plan.

## 9.4 SIDE DOORS

A. **Side Doors Panels**. The Contractor shall overhaul the door panels as required to fully restore functionality and appearance. The door pockets, including the bottom tracks, door guides, drains, and inside walls shall be cleaned, inspected, and overhauled to restore original functionality. All existing hardware shall be overhauled and seals shall be renewed, including the pocket weather seals, and Teflon guides. Side door hangers shall be renewed and adjusted as required to provide free operation. **For estimating purposes, it is anticipated 20% of hangers will be replaced.**

B. **Electric Door Operators**. The Contractor shall remove all door operators from the car. The door operators shall be overhauled by the OEM or an Administration approved equivalent. The operators, connection rods, and extension arm assemblies shall be overhauled. All rubber parts, gaskets, and springs shall be renewed or replaced. All parts requiring repainting shall be painted according to accepted practices. The overhauled unit shall be checked and tested to the latest OEM specifications and procedures and certified to OEM performance criteria.

C. **Motors**. The Contractor shall clean and inspect the door operator motors for proper operation. Motors shall be inspected and tested at a minimum for malfunction, bad bearings, burned or worn commutators and serviced in accordance with OEM specifications. All non-repairable motors shall be replaced with new motors. All motor brushes shall be replaced with brushes meeting OEM specifications.

D. **Gear Box**. The gear box shall be overhauled per OEM specification. All gaskets shall be replaced.

E. **Mechanical Lock Assembly**. The mechanical door lockout assembly shall comply with APTA SS-M-10 Paragraphs 2.8.1 and 2.9. The operation of the cutout switch shall be verified.

F. **Limit Switches, Cams and Resistors**. The Contractor shall replace all limit switches and resistors. The proper operation of the cams shall be verified.

G. **Door Operator Cutout Switch**. The Contractor shall verify that the door operator cutout switch functions properly. Doors shall not be operable when the switch is in the cutout or bypass position. When the switch is in the normal position the door function shall be re-established.

H. **Master Door Controllers**. The Master Door Controller Assembly shall be removed, cleaned and overhauled. All switches and relays shall be replaced with devices meeting OEM specifications. The Contractor shall replace the indicator lights with service proven LED indicator lights. The LED Indicator Lights shall be approved by the Administration. **[CDRL 902]**

   The overhauled Master Door Controller Assembly shall be inspected and tested to the latest OEM specifications and procedures and certified to OEM performance criteria.

I. **Motorman's Door Controller**. The Motorman's Door Control Assembly shall be removed, cleaned, and overhauled. All switches, relays, and indicator lights shall be replaced with devices meeting OEM specifications. The Contractor shall propose the use of service proven LED indicator lights to the Administration as part of CDRL 902. The renewed Motorman's Door Control Assembly shall be inspected and tested to the latest manufacturer drawings and procedures and certified to OEM specifications.

J. **Emergency Door Release Assemblies**. The Contractor shall inspect all Emergency Door Release Assemblies for function and ease of use. All cable assemblies shall be inspected. The interior and exterior emergency releases shall operate in accordance with the current revision of APTA Standard SS-C&S-012-02.

K. **Emergency Pull Handles**. The Contractor shall inspect and overhaul all emergency release pull handles. The Contractor shall ensure all handles are properly secured to the cable.

L. **Emergency Door Release Signs**. All emergency door release signs shall be cleaned to ensure that the signs are clearly visible and readable per OEM requirements. Signs that are worn or damaged shall be replaced. Replacement signs shall comply with current FRA, ADA and APTA requirements and shall be approved by the Administration. **[CDRL 903]**

M. **Sensitive Edge Assembly and Switch**. The Contractor shall renew the sensitive edge assembly and pressure wave switch with an OEM switch, upgraded to the latest configuration per the OEM recommendation, or Administration approved equal. The proper mounting and routing of the pneumatic tubing between the sensitive edge assembly and the pressure wave switch shall be verified. Controls for the doors shall be arranged so that obstruction sensing by the panel edge complies with APTA SS-C&S-012-02.

N. **Door Control Relay Panel**. The Contractor shall overhaul the relay panel per OEM requirements. All relays and suppression devices shall be replaced. The Contractor shall test the proper function of the relay panel and verify all interfaces.

O. **Door Closing Warning**. The Contractor shall verify the proper functionally of the door closing warning circuits. The audible and visual alarms shall be validated in accordance with the OEM requirements.

P. **Crew Switch**. The Contractor shall renew the interior and exterior crew switches. Their functionality shall be validated to OEM requirements. All exterior crew switch covers and gaskets shall be renewed.

Q. **Outside Signal Lights**. The outside door indicator lights shall be replaced with LED indicators mounted in low profile housings. The indicators shall be visible in bright daylight from the end of an eight (8) car consist.

R. **Conductors Buzzer**. The Contractor shall verify the function of the Conductors buzzer in each vestibule in accordance with the OEM requirements.

S. **Override Relay**. The Contractor shall verify that the override relay prevents the door operation by cutting off the power to door control trainlines and door control switches.

T. **Side Doors Panels**. The Contractor shall remove all side doors. All mechanical parts and mechanisms shall be inspected for proper function. All elastomeric materials shall be renewed. All exterior weather stripping and seals including those mounted to the carbody shall be renewed. All door panels shall be cleaned and inspected. Damaged panels shall be repaired or renewed. Superficial damage to the door panels shall not be repaired. Door shall be water tight and pass a leak tasked in accordance with specification TS Section 14.

U. **Miscellaneous Equipment**. The Contractor shall perform functional checks on all miscellaneous door control system components and replace any broken, missing, or worn-out parts, and test them in accordance with OEM requirements.

## 9.5 END DOORS

Non-cab and cab end doors shall be overhauled to fully restore functionality and appearance.

All hardware shall be overhauled and seals shall be renewed including door rubber and weather seals.

On cab cars the F-End pneumatic door seals shall be overhauled and renewed as needed. All air plumbing, fittings, and hardware shall be inspected, replaced as needed, and leak checked. The three-way air valve shall be overhauled and tested. If necessary the air pressure shall be adjusted to OEM requirements.

Threshold and drains shall be cleaned and overhauled to restore original functionality.

Inspect, clean, test, overhaul, or renew if required, and reinstall the door lock assembly.

## 9.6 VESTIBULE DOORS

Vestibule doors panels shall be overhauled to fully restore functionality and appearance. The door pockets, lower tracks, drains, inside walls shall be cleaned, inspected, and overhauled to restore original appearance and functionality. All hardware shall be overhauled and seals shall be renewed, including weather seals and Teflon guides. The door hangers, upper guide, sills, lever, arms, and base shall be overhauled or renewed to restore original functionality. For estimating purposes, it is anticipated 20% of hangers, guides, and arms will be replaced.

The Contractor shall propose an alternate design to the existing electrically operated overhead door operator and touch switch. **[CDRL 904]** The alternate design shall utilize linear motor technology or permanent magnet type motor technology and microprocessor control. The alternate design shall maintain the OEM door panel Carbody interfaces and utilize the existing door panel design in the alternate proposal. As part of the alternate door proposal, the contractor shall propose a new vestibule door OPEN touch switch design for Administration approval. All vestibule door touch plates shall be replaced with the new design.

The alternate door control and touch switch design shall meet all the requirements of the existing OEM door controls including:

1. Time opening sequence that responds to the current push plate; Door Opens upon activation and remains open for 15 seconds (adjustable from 10 seconds in 1 second intervals)

2. Détente which will hold the door closed during loss of power regardless of car motion and vibration with up to a 6 inch super elevation.

3. Hold open feature to prevent door oscillations during the open interval when the car leans toward the door closing direction with up to 6 inch super elevation.

4. A pressure wave sensitive edge capable of sensing a flat bar 3 inches wide by ¼ inch thick, perpendicular to door panel, and between the door panel and the door jamb. The sensitive edge shall sense the obstruction over the entire length of the door panel, with the exception of the 3 inches from the top of the door panel and 1 inch from the bottom of the door panel.

5. Three-Position guarded switch located near the door in the passenger compartment with the following positions:

   a. "OPEN" (spring return) allows for a 5 minute door open duration when activated by the momentary switch. The mode returns to "NORMAL" after the 5 minutes times out. The 5 minute open duration shall be canceled by briefly moving the switch to the MANUAL position and then to the NORMAL position.

   b. "MANUAL" (un-powered) allows for the unpowered door to be opened and closed manually.

   c. "NORMAL" Allows for the door to operation as described.

6. 3 Position guarded switch located in the vestibule near the door which shall function similar to the passenger compartment switch.

7. The door operator and controls shall operate from the 74 VDC car battery system and be able to be operated down to the car load shed voltage without damage to the door operator motor and controls.

8. The maximum force required to move an unpowered door shall not exceed a force of 20 pounds-force.

9. The drive mechanism shall be designed and constructed to minimize the torque applied to the door panel.

10. Mechanical failure of the door drive mechanism shall not impede the manual movement of the door panel.

11. The door opening and closing force shall not exceed 25 pounds-force over the travel of the door.

12. The door shall open and close with a 60 pounds-force applied normal to the center of the interior door surface at a height of 56 inches above the floor.

13. Stall protection shall be provided to prevent damage or degradation to the door operator should the door panel become immobilized for extended periods of time.

14. Doors shall not require adjustment more often than every 2 years after the initial break-in period.

15. The door motor, drive assembly and controls shall not require maintenance between heavy overhaul periods.

## 9.7 TRAP DOORS

The Contractor shall clean, inspect and restore the stairwell trap door to the OEM requirements. When in the down position, the spring tension of the trap door shall be adjusted so that the

door will raise a minimum of ten inches. When in the up position, the spring tension of trap door shall be adjusted as to prevent the door from slamming shut or creating a pinch hazard.

## 9.8 REQUIRED CDRLS

901 A Door and Door Control Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul.

902 The LED Indicator Lights shall be approved by the Administration.

903 Replacement signs shall comply with current FRA, ADA and APTA requirements and shall be approved by the Administration.

904 The Contractor shall propose an alternate design to the existing electrically operated overhead vestibule door operator and touch switch.

# SECTION 10
# HVAC

# SECTION 10
# HEATING, VENTILATING AND AIR CONDITIONING (HVAC) UNIT AND CONTROLS

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# SECTION 10
# HEATING, VENTILATING AND AIR CONDITIONING (HVAC) UNIT AND CONTROLS

## 10.1 GENERAL SYSTEM DESCRIPTION

Each MARC III car is equipped with HVAC package units located on the roof at each end of the vehicle. The HVAC System specification for each unit is:

A. Voltages: 480 VAC/3 phase, 120 VAC, 24 VDC
B. Weight: 1,975 Pounds (898 Kgs.)
C. Overhead heating capacity: 24 kW per unit
   1. Two 12 kW Stages
   2. Open coil elements
D. Refrigerant Type: R-22, 14 lbs/unit
E. Cooling Capacity: 10.5 Tons (126,000 btu/hr) per unit
   Two 5.25 Ton Refrigerant Circuits
F. Air Flow: 1,800 CFM per Unit (600 CFM Fresh Air)
   A Temperature Control Panel automatically maintains the car interior temperature between 69 and 73 of the vehicle by providing necessary levels of heating and cooling powers.

## 10.2 OVERHAUL REQUIREMENTS

Much of the existing HVAC equipment shall be retained and overhauled. Overhauling requirements are discussed in the sections below; base scope of work modifications, additions and options are also discussed in sections below. The Contractor shall submit an HVAC Overhaul Plan to the Administration for review and approval prior to starting the overhaul **[CDRL 1001]**.

## 10.3 SCOPE OF WORK

### 10.3.1 Temperature Controller

The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with a Vapor Temperature Control Unit (part no. 201040017) or an Administration approved equivalent microprocessor controller compatible with the existing control voltages and control logic developed by the OEM. The contractor shall provide a minimum three spare digital inputs and outputs and one spare analog input and output on the controller. The microprocessor controller shall be capable of detecting and logging system faults which may be retrieved by maintenance personnel using a portable test unit (PTU) supplied by the contractor.

The retrieved fault logs shall be in file format that is compatible with Microsoft Excel. The controller shall have sufficient RAM memory to store faults logged between regular six-month maintenance intervals as agreed with the Administration. If the fault storage reaches capacity the existing faults shall be overwritten on first in first out (FIFO) sequence. The fault logs shall be capable of being cleared by the PTU. Active faults shall be indicated and displayed on or in close proximity to the microprocessor controller for convenient viewing by the crew or maintenance personnel without the use of a PTU. The contractor shall provide a list of faults that will be detected and stored by the microprocessor controller to the Administration for approval. **[CDRL 1002]** The methodology of detecting the faults shall be presented for approval as part of the HVAC controls design review.

The contractor shall submit the following documents during the design reviews for approval by the Administration. The documents shall comply with the requirements of TS Section 16.2, and CDRL 1601:

1. Software Requirements Specification (including list of faults)
2. Software Development Plan
3. Software Quality Plan
4. Software Validation Test Plan

### 10.3.2 HVAC Control Panel

The control panel shall be removed and cleaned. All contactors, overloads and control devices shall be renewed. Circuit breakers shall be cleaned and tested. The renewed panel shall be tested to the OEM requirements.

### 10.3.3 HVAC Unit

**Air Conditioning System.** The existing air conditioning system is rated for operation on nominal 480 VAC, 3-phase 60 Hz power and 120 VAC supplied by the existing fleet of MARC locomotives. The existing HVAC units were originally manufactured by Stone Service Corporation. The existing system utilizes refrigerant R-22. The existing system shall be modified and designed for use with refrigerant R-407c or R-410a. The contractor shall present details of any required unit modification for the refrigerant change to the Administration for review.

The HVAC unit shall be inspected and unless otherwise specified, items such as mounting studs, mounting brackets, covers, clamps, weld nuts, threaded inserts; support bars, latches, drain tubes, and other components that may be found to be worn or damaged shall be overhauled or renewed. All resilient mounts shall be renewed. Unless otherwise specified all mounting hardware shall be renewed.

The HVAC Unit and carbody brackets shall be inspected and repaired if damage is found.

All HVAC unit cover and vehicle interface sealing gaskets shall be inspected for permanent set and poor adhesion to the cover or unit. If defects are found, the cover or unit substrate shall be cleaned and the gasket renewed.

### 10.3.4 Condenser-Compressor Section

The compressor-condenser section of the unit shall be inspected for damage and cleaned. The condenser section cover shall be inspected for damage and cleaned. All insulation shall be renewed. All insulation substrates shall be cleaned prior to the application of adhesive for the renewed insulation.

The scroll compressors shall be replaced with new scroll compressors that are sized for and compatible with the R-407c or R-410a replacement refrigerant. The compressor isolation mounts and hardware shall be renewed. All Rotolock fittings shall have their seals renewed. The compressor crankcase heaters shall be renewed. Vibration eliminators shall be cleaned inside and out and inspected for damage.

The condenser coils shall be replaced with new. The new coils shall have the same dimensional features and performance criteria as the OEM coils. The frame and center support shall be constructed of stainless steel and the end plates shall be pierced and flared to support the tubes. The tube and fin material shall be copper. The tubes shall be mechanically expanded to secure the fins. The coils shall be pressure tested in accordance with the OEM requirements. All condenser section piping shall be inspected for wear or damage and cleaned inside and out. Particular attention should be given to clamped and pass-through areas during inspection. All flexible refrigerant hoses shall be replaced with low-permeation hose. All service valves, shut off valves, and check valves shall be renewed.

All elastomeric material used for piping clamps and pass-through grommets shall be renewed. The condenser fan shall be inspected cleaned and inspected. The condenser fan motor and hardware shall be renewed. The fan and motor assembly shall be balanced in accordance with the OEM requirements. Electrical conduit gaskets shall be renewed.

### 10.3.5 Evaporator Section

The evaporator section of the HVAC unit shall be cleaned and inspected for damage. Damaged insulation shall be replaced in kind. The evaporator coil shall be removed cleaned inside and out and pressure tested in accordance with the manufacturers requirements and overhauled. All bent fins shall be straightened. All evaporator section piping shall be inspected for wear or damage and cleaned inside and out. Particular attention should be given to clamped and pass through areas during inspection.

The following devices and components shall be renewed:

1. All Shutoff Valves, Service Valves and Test Ports (Schrader Valve Caps shall have retaining chains)
2. Sight Glass Moisture Indicator and Glass Gasket
3. Thermal Expansion Valves
4. Low and High Pressure switches
5. Low and High Pressure Gauges
6. Refrigeration Control Panel Test Switch
7. Liquid Line Solenoid Valve and Coil
8. Filter/Dryer Core
9. Air Filters
10. Fresh Air Temperature Sensors

The evaporator blower assembly shall be removed cleaned and inspected. The blower motor shall be renewed. The blower assembly shall be balanced by adding weights to the fins of the blower wheels. The maximum head displacement shall not exceed 0.2 mils peak to peak. The flow switch shall be renewed. The contractor may propose and alternate method of detecting air flow to the Administration for consideration.

### 10.3.6 Overhead Heater

The overhead heater assembly located in the evaporator section of the HVAC unit shall be cleaned and inspected for damage and have the following components renewed:

1. Heating Elements
2. Over Temperature Limit Switches
3. Cracked, chipped or damaged Insulators
4. Damaged wire terminations

### 10.3.7 Temperature Sensors

The return air, fresh air, duct limit, layover and air distribution temperature sensors shall be renewed. Housing and support brackets shall be cleaned and inspected for damage. Damaged housings and support brackets shall be renewed.

The contractor shall renew all fans installed on the air distribution temperature sensor.

### 10.3.8 Ducts and Diffusers

All supply air, return air and fresh air ducts shall be inspected and cleaned. Damaged insulation shall be renewed. Return air grills shall be cleaned and inspected. Broken or defective latching (primary and secondary) hardware shall be renewed. Sealing gaskets that are

worn, torn or have taken a permanent set shall be renewed. If the supply air diffusers are removed for cleaning the contractor shall record the cars number and location that the diffuser was removed from. If adjustable dampers are present on the diffuser they shall also record the damper setting. Supply air diffusers shall be reinstalled in their OEM positions with the OEM damper setting.

Supply air diversion dampers shall be cleaned and inspected. The damper diverter shall be checked for freedom of movement and overhauled if found defective. The damper motor shall be renewed.

### 10.3.9 Floor Heaters and Grills

Floor heater covers, grills, and protective plates shall be cleaned and replaced as needed. The floor heater strips shall be tested to the OEM requirements. The Contractor shall overhaul the heater; care must be taken to assure heat transfer fins are not damaged. Defective heater strips shall be renewed. All electrical connections are to be torqued to OEM specifications. All hardware and insulators shall be renewed.

Any heater element that is found to be defective or that cannot be overhauled shall be renewed. **For estimating purposes, it is anticipated 10% of heater elements will be replaced.**

The fan heaters located on the mid-level shall be cleaned and overhauled to OEM requirements. The fan motors shall be renewed.

### 10.3.10 Cab Heater

The cab heater shall be replaced.

### 10.3.11 Testing

In addition to the testing requirements in TS Section 14, the Contractor shall submit an On-vehicle Climate Control Validation Test plan for approval. **[CDRL 1003]**
In accordance with TS Section 14.3, the contractor shall submit for approval a design qualification test plan to validate that the microprocessor controller meets or exceeds the OEM interior climate control requirements and fault detection and logging requirements of this technical specification.

### 10.3.12 Spares

The Administration has four (4) spare HVAC units that shall be part of this scope of work. The Contractor shall be responsible for the overhaul of spare HVAC units in accordance with this specification.

Spare HVAC units shall be used as floats and installed on completed cars during the course of this project.

## 10.4 REQUIRED CDRLS

1001 The Contractor shall submit an HVAC Overhaul Plan to the Administration for approval.

1002 The Contractor shall provide a list of faults that will be detected and stored by the microprocessor controller to the Administration for approval.

1003 The Contractor shall submit an On-vehicle Climate Control Validation Test plan for approval.

# SECTION 12

# COMMUNICATIONS

## SECTION 12
## COMMUNICATIONS

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# SECTION 12
# COMMUNICATIONS

## 12.1 GENERAL SYSTEM DESCRIPTION

The existing communication system includes a PA amplifier, AAR base, speakers, control head panels, interior and exterior destination signs, a sign controller, radio, and Radio/PA/IC control head.

The MARC III passenger information signs are LED displays interconnected to the sign control unit over a RS485 network. The signs are from Daktronics, Inc.; 331 32nd Ave; Brookings, SD. Part numbers of the signs are as follows:

- 0Z-6639-01C - Interior LED Master
- 0Z-6639-01A - Interior LED Slave
- 0Z-6639-03C - Exterior LED Master
- 0Z-6639-03D - Exterior LED Slave

Cab Cars are equipped with a GPS and wireless modem to aide in the determination of vehicle location and to communicate data to and from the wayside.

There are eight (8) passenger compartment speaker assemblies installed per car.

## 12.2 OVERHAUL REQUIREMENTS

Communication system components including PA amplifier, AAR base, sign controller and control head panels shall be replaced with new assemblies that meet the functional requirements of this section. The contractor shall submit a Communications Overall Overhaul Plan for Administration review and approval **[CDRL 1201]**. The plan shall include all software documentation requirements in TS Section 16.2.

An Automatic Announcement System Upgrade (AAS) is to be installed in order to provide additional capabilities to the MARC III cars. The upgraded AAS is to provide the following functionality:

1. Provide audio and textual messages to train passengers as described in this section
2. Permit transmitting ad hoc messages from any authorized AAS user to any selected vehicle(s).
3. Be fully compatible with MARC IV cars outfitted with the Axion Technologies communication system, which will be operated in a mixed fleet environment.

4. Be compatible with current MARC III destination signs.

The AAS and other supplied communication equipment must be designed and built to comply in all respects with all applicable laws, regulations, standards, and recommended practices of the following agencies and organizations:

A. US Department of Transportation (USDOT)

B. Federal Railroad Administration (FRA)

C. Federal Transit Administration (FTA)

D. US Public Health Food and Drug Administration (FDA)

E. America Public Transportation Association (APTA)

F. State of Maryland

G. District of Columbia

H. Association of American Railroads (AAR)

Where there is a conflict, the most restrictive shall apply. The equipment shall be suitable in all respects for use in the Administration's vehicles, and fixed installations related to their commuter rail system.

Although the required warranty is defined elsewhere in the Contract Documents, the design of the AAS and the level of quality and durability of the AAS components shall be consistent with minimum useful life of fifteen (15) years.

Unless otherwise stated, the requirements within the Specification apply both to vehicle and fixed equipment supplied under this Contract.

## 12.3 SCOPE OF WORK

A new communications system, complete with passenger emergency intercoms, automatic announcement system, and exterior speakers shall be provided that is compatible with the Axion MARC IV PEI and AAS. The system shall control the functions identified in this section.

The communications system shall permit the train crew to make announcements and to page the passengers and other train crew members by use of the speakers in the passenger areas of the cars. It shall permit two-way radio communication between the train crew/Operator and other trains and wayside installations. It shall permit private two-way intercommunication between any two (2) communication control panels within the train; e.g. between train crew and Operator. It shall also accommodate recorded or digitized human speech messages for announcements or other passenger information in accordance with the requirements of 49 CFR 38 and enable announcements to be interfaced with the interior destination sign for visual broadcasting. Passengers shall have the capability to communicate with the train crew members via the Passenger Emergency Intercom System. In addition, the system shall be capable of

receiving and displaying on the interior signs arbitrary text messages addressed to the passengers and/or crew (paging system). Each cab car shall include cellular communications capabilities incorporated with the radio communications and capabilities to record all PA announcements. The communications system shall also provide for transfer of data between the train and wayside installations using a cellular modem and/or via wireless LAN.

All trainline communication shall be compatible with existing MARC cars. The PA/IC functions shall be included in the door and communications trainline system. The cars shall utilize analog communication for intra-car communication. All replaced cabling used for data/ communication shall be shielded twisted pairs capable of digital communication transmission.

The communication system shall utilize audio for trainline transmission of voice signals, along with conventional baseband audio trainlines for backward compatibility with older MARC rolling stock. The digital audio subsystem shall be compatible with MARC IV cars.

The PA, radio, and wayside to train communication equipment shall be provided with separate circuit breakers. Apparatus requiring power conversion devices, because of voltage range requirements, shall have those devices designed integral to the apparatus. Power conversion devices, external to the apparatus, shall not be acceptable.

Suppliers of the communication systems shall have proven experience in the successful design and manufacture of apparatus of this type for similar railcar application, and the Contractor shall follow the manufacturer's recommendations for its installation.

### 12.3.1 Radio

The radio shall be inspected and repaired or replaced as necessary per the OEM procedures.

### 12.3.2 Public Address and Intercom System

A. **PA Amplifier.** The PA amplifier and AAR base shall be replaced. The Amplifier shall be functionally equivalent to the equipment found in the MARC IV cars operated by the Administration, upgraded to perform based on the requirements of this section. The amplifier shall be mounted in the electric locker of all cars. The power amplifier shall have sufficient power to drive all speakers within the car, with 25% reserve power.

   With normal speech input, the amplifier shall operate continuously, at full output, at rated input voltage, without degradation. The compression amplifier shall produce a minimum compression range of 35 dB, with a maximum output level variation of 2 dB and a maximum total harmonic distortion of 3% at the compressor output. The compression amplifier shall operate satisfactorily with the speaker being 1" to 12" from the microphone.

The PA system shall include an internally switched selectable method of controlling the audio output level in each car, based upon the ambient noise level.

1. Each car shall be automatically controlled, independent of other cars, to provide a comfortable, intelligible sound level at all seating locations.

2. At no time shall an increase in audio levels result in audio feedback.

Each PA announcement made by a crew member shall be recorded and stored digitally in the cab car. The announcements shall be digitally recorded, vox controlled, and stored in non-volatile memory. The storage memory shall have sufficient capacity to store not less than eight (8) hours of PA announcements with a memory organized in a "first in first out" basis. The system shall permit the downloading of announcement information to PC and removable PC memory card (PCMCIA or USB), and via the wireless wayside to train link. The following shall be maintained for each PA announcement:

1. Announcement
2. Train Number
3. Time of Announcement
4. Train Consist including Road Numbers for All Cars
5. Car Number where Announcement was initiated
6. Location of train

Details of the design, arrangement, and installation of the PA system shall be included in the Communications Overall Overhaul Plan.

**B.** **Interior Speakers.** All speakers shall be inspected and tested and reused if good. A speaker inspection and test procedure shall be included in the Communications Overall Overhaul Plan. Speakers that do not pass the inspection and test shall be replaced. **It is estimated that approximately 25% of all speakers shall be replaced.**

C. **Exterior Speakers.** To comply with the requirements of 49 CFR 238.121, exterior speakers shall be installed in each side of the coach.

A minimum of two speakers shall be installed in each coach side. They shall be positioned at a height and longitudinal location that assures that a passenger standing on a station platform, anywhere along the length of a coach, is able to hear PA announcements. If necessary, to provide satisfactory performance, a third speaker shall be installed at the longitudinal center of each side of the coach.

The speakers shall be specifically designed for external use and the speaker enclosures shall be watertight. Each speaker shall be covered with a stainless steel grille that matches the coach surface finish and shall be secured by tamper-proof fasteners.

The audio level of the exterior speakers shall be adjustable separately from the interior speakers.

The design of the PA system shall allow selection of manual PA announcements over interior and/or exterior speakers at the conductor control head. The logic for speaker control shall be through the trainline communication network. Automated announcements shall be configurable to play on internal, external, or both via the AAS database.

D. **PA Control Head.** Control heads shall be replaced, and functionally equivalent to the control head currently used by the Administration, with expanded functionality to meet the functional requirements of this section. Control panels shall remain at the existing locations. The system shall be designed such that feedback or interference from nearby speakers to an active microphone shall be minimized. Functionality of the control heads shall be expanded to allow the manual selection of internal, external, or both speakers, and to allow communication and control of Passenger Emergency Intercom calls.

### 12.3.3 Passenger Emergency Intercom

The coaches shall include a new Passenger Emergency Intercom (PEI) system. The PEI system shall permit emergency communication between passengers, the Operator and the Train Crew between the PEI station panels and the intercom system. The PEI system shall comply with the requirements of 49 CFR 238.121. The PEI system shall function identically and be fully interoperable with the PEI system outfitted on the MARC IV railcars.

A PEI station, for passenger use, shall be located in each middle level and in each toilet room. The exact mounting location for each panel shall be included in the Communications Overall Overhaul Plan. Each station shall be equipped with the following:

1. A flush mounted microphone and intercom speaker behind a perforated vandal-proof grille.

2. A push to call push button. When the PEI panel's push button is depressed, the PEI lights on all the communication panels in the consist shall flash and the audible signal shall be activated. A distinctive tone shall be sounded in the cab when a signal is initiated from the PEI system.

3. An LED to indicate to the passenger that a call has been placed. The LED shall

flash when the push button is pressed and shall change to steady illumination after the call is answered by a crew member.

4. Operating instructions shall be provided adjacent to the panel in photo luminescent material per APTA Standard SS-PS-001-98.

System design, layout, and functionality shall be included in the Communications Overall Overhaul Plan.

### 12.3.4 Automatic Announcement System (AAS)

The Contractor shall provide all necessary hardware and software to allow the AAS system to perform the functions listed below:

**A.** **Route and Station Information.** The Administration's MARC service current route and station information are provided in Tables 1 through 4, following. Distances are approximate and the Contractor shall be responsible for obtaining accurate distance data.

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 7.5 | (7.5) | Silver Spring |
| 03 | 11.0 | (3.5) | Kensington |
| 04 | 12.3 | (1.4) | Garrett Park |
| 05 | 16.7 | (4.3) | Rockville |
| 06 | 20.8 | (4.1) | Washington Grove |
| 07 | 21.6 | (0.8) | Gaithersburg |
| 08 | 23.6 | (2.0) | Metropolitan Grove |
| 09 | 26.4 | (2.8) | Germantown |
| 10 | 28.9 | (2.5) | Boyds |
| 11 | 33.4 | (4.5) | Barnesville |
| 12 | 35.5 | (2.1) | Dickerson |
| 13 | 42.8 | (7.3) | Point of Rocks |
| 14 | 49.8 | (7.0) | Brunswick |
| 15 | 55.7 | (5.9) | Harpers Ferry |
| 16 | 62.0 | (6.3) | Duffields |
| 17 | 74.0 | (12.0) | Martinsburg |

Table 1. BRUNSWICK LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station Washington |
| 02 | 9.0 | (9.0) | New Carrollton |
| 03 | 11.3 | (2.3) | Seabrook |
| 04 | 16.6 | (4.8) | Bowie State |
| 05 | 22.4 | (5.8) | Odenton |
| 06 | 29.7 | (7.3) | BWI Rail Station |
| 07 | 33.0 | (3.0) | Halethorpe |
| 08 | 37.5 | (4.5) | West Baltimore |
| 09 | 40.3 | (2.8) | Penn Station, Baltimore |
| 10 | 52.0 | (11.7) | Martin Airport |
| 11 | 60.9 | (8.9) | Edgewood |
| 12 | 70.5 | (9.6) | Aberdeen |
| 13 | 76.5 | (6.0) | Perryville |

Table 2. PENN LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 7.5 | (7.5) | Silver Spring |
| 03 | 11.0 | (3.5) | Kensington |
| 04 | 12.3 | (1.4) | Garrett Park |
| 05 | 16.7 | (4.3) | Rockville |
| 06 | 20.8 | (4.1) | Washington Grove |
| 07 | 21.6 | (0.8) | Gaithersburg |
| 08 | 23.6 | (2.0) | Metropolitan Grove |
| 09 | 26.4 | (2.8) | Germantown |
| 10 | 28.9 | (2.5) | Boyds |
| 11 | 33.4 | (4.5) | Barnesville |
| 12 | 35.5 | (2.1) | Dickerson |
| 13 | 42.8 | (7.3) | Point of Rocks |
| 14 | 53.7 | (11.9) | Monocacy |
| 15 | 56.1 | (2.4) | Frederick |

Table 3. FREDERICK LINE

| Station Number | Accumulated Mileage | Station-to-Station Mileage | Station Name |
|---|---|---|---|
| 01 | 0.0 | (-) | Union Station, Washington |
| 02 | 5.9 | (5.9) | Riverdate |
| 03 | 7.0 | (1.1) | College Park |
| 04 | 9.2 | (2.0) | Greenbelt |
| 05 | 13.3 | (4.1) | Muirkirk |
| 06 | 17.1 | (3.8) | Laurel |
| 07 | 17.6 | (0.5) | Laurel Racetrack |
| 08 | 20.3 | (2.7) | Savage |
| 09 | 22.6 | (2.3) | Jessup |
| 10 | 25.3 | (2.7) | Dorsey |
| 11 | 29.6 | (4.3) | St. Denis |
| 12 | 36.4 | (6.8) | Camden Station, Baltimore |

Table 4. CAMDEN LINE

**B. <u>On-board Route and Station Information.</u>** The AAS shall automatically visually and audibly announce train route and station information based on the train number entered by the train crew. The AAS shall automatically perform the following functions:

1. Display the train number and final destination on the exterior destination signs.
2. At an Administration programmable distance before a scheduled station stop, the interior destination signs in all cars of the consist shall display "The next station is…" and the station name. The system shall simultaneously broadcast the same message over the PA system on the entire consist.
3. Once the train has stopped at a scheduled station stop and the passenger doors are opened, the interior destination signs in all cars of the consist shall display "This station is…" and the station name. The system shall simultaneously broadcast the same message over the PA system on the entire consist.

4. At an Administration programmable distance after departing from a scheduled station stop, the interior destination signs in all cars of the consist shall display "The next station is…" and the station name; the same message shall be heard over the PA system on the entire consist.

5. The system shall be capable of making train connection announcements when applicable. When programmed to do so, it shall automatically audibly announce and display passenger connection information, such as "Change here for train to …", "The train to … is on track …", etc.

6. The AAS shall perform the above within an accuracy of 30 meters.

7. It shall be possible for the Administration to change any of the messages either on-board via a laptop computer, USB memory device, or via the wireless data link to the wayside.

8. The station stop sequencing associated with any given train number is subject to change several times per year as schedules are adjusted. There shall be an automated, centralized mechanism for updating this database on each vehicle. There shall not be a necessity to update each vehicle individually to accomplish this periodic updating. This centralized update shall apply to both the on-board audio as well as the displayed text information. Schedule updates shall be capable of having an affectivity date in order to allow for advanced transmission of the changes.

**C. <u>Wayside to Train Communication.</u>** The AAS shall allow bidirectional data transfer from the wayside to the train. The wayside portion of the AAS shall use the cab car numbers as the basis for identifying vehicles with which to communicate. The Administration will use the cab car number to identify the train number.

The contractor shall supply and install a separated data modem and antenna.

The AAS shall allow the OCC to send textual paging messages to interior destination signs and/or audio messages over the vehicles PA system as follows:

- Selected trains, using train numbers of vehicle numbers;
- All vehicles based on geographic location (all vehicles within defined radius of a particular point or within a defined geographic area);
- The entire vehicle fleet.

These messages shall be either selected from a predetermined list of prerecorded messages or dynamically generated and transmitted from the OCC on an ad-hoc basis.

The wayside to train communication shall also allow the update of on-board software, databases, and other files including audio messages.

It shall be possible to interrogate the AAS to determine train location, system status, software revision, and other diagnostic functions via the wayside to train communication.

**D.** **Train Position.** The AAS shall determine the location of the head-end car in the consist with an accuracy of plus or minus 30 meters. When the consist is operating in a locomotive leading mode the train position shall be calculated to reflect the first passenger car after the locomotive.

Train position information shall be based on GPS location. When the GPS data is not available due to loss of the satellite signals or other reason the train position information shall be determined by inertial navigation or an independent speed sensor to be supplied and installed on each cab car as part of this contract.

The system shall maintain the last known vehicle location in memory to allow the system to quickly respond to a power loss or power-up when the GPS data is not available.

The contractor shall supply and install a separated DGPS receiver and antenna. If the contractor opts to supply a separate DGPS receiver and antenna the contractor shall supply an analysis to show that the location of the antenna does not interfere with or is not affected by other existing antennas on the vehicle.

**E.** **System Response Time.** The AAS system shall respond to user command in the minimum time possible. The Contractor shall prepare an analysis for Administration approval for any command that cannot be executed within 50 ms.

There shall be a visual and or audio feedback to indicate to the user the status and completion of each command or function requested. The maximum time from power-up to system ready shall be 30 seconds. (Note: this time does not include the time required to acquire the GPS satellite data if the Contractor supplies a stand-alone GPS receiver).

In the event of loss of power to the AAS, the system shall retain its current position and route information. No user intervention shall be required to restart the AAS on reapplication of power.

**F.** **Security.** The wayside to train communication system shall be secured against unauthorized access or attack, both from the vehicle itself and from the wayside. Security requirements shall apply both when the vehicle is in revenue service and when the vehicle is out of service for maintenance or storage. Security measures shall be consistent with industry best practices at the time of design.

To demonstrate compliance, the Contractor shall prepare and submit at the FDR, for approval by the Administration, a Wayside to Train Communication System

Vulnerability Assessment identifying all potential system vulnerabilities; associated risk (including exploit likelihood and consequences); countermeasures applied; and resulting mitigated risk. **[CDRL 1202]** The report format shall be similar to that of a hazard analysis; a representative sample of the proposed report format shall be submitted for approval.

Exploits to be considered shall include, but are not necessarily limited to, the following, as appropriate:

1. Vandalism;
2. Eavesdropping;
3. Device/user impersonation;
4. Dictionary attacks;
5. Message modification;
6. Session hijacking;
7. Buffer overflow;
8. Denial of service;
9. Jamming (physical layer denial of service);
10. Virus/worm infection;
11. Unauthorized software installation; and
12. Unauthorized root/administrator access.

Security measures shall include, but are not necessarily limited to, the following, as appropriate:

1. Restricting physical access to communication and control system components to all but authorized personnel;
2. Use of access control lists (ACL);
3. Use of device and/or user authentication;
4. Use of encryption;
5. Use of hardware keys in conjunction with passwords/pass-phrases;
6. Access logs;
7. Intrusion detection/prevention;
8. Antivirus;
9. Proper isolation of security critical system functions from other functions;
10. Application of secure coding practices; and

11. Use of secure operating systems.

Security measures shall be designed and implemented such that their effect on reliability, availability, and basic system operation is minimized.

The Contractor shall make available any security updates to the Administration over the life of the Contract without charge. The Contractor shall notify and make available to the Administration any recommended security upgrades over the service life of the AAS.

**G. <u>OCC User Functions.</u>** The AAS shall allow an OCC user to perform the following functions in real time:

1. Modify on-board route and station sequence information;
2. Initiate and address wayside to train messages;
3. Display or generate a report on the diagnostics and error handling information for the AAS.
4. Display or generate a report on messages sent over the AAS

**H. <u>On-board User Functions.</u>** The AAS system shall allow the on-board (vehicle) user to perform the following functions:

1. Initiate pre-recorded paging system messages;
2. Enter the train number;
3. Pause or silence all on-board announcements;
4. Adjust on-board announcement volume (password protected);
5. Access system diagnostic tools (password protected);
6. Provision to permit the train crew to disable the AAS input to the PA in the event of a faulted AAS, while still maintaining the functionality of on-board, manual, PA messages;
7. Resynchronize the train location in the event of the loss of the GPS data.

## I. On-board Equipment:

1. Destination signs - The contractor shall utilize the existing Electronic Interior and Exterior Destination Signs. All signs shall be inspected and repaired or replaced as necessary per the OEM procedures.

2. Operator's Control Panel - The operators control panel shall allow the train crew to control the AAS functionality and allow the maintenance staff password access to diagnostic control functions.

   The control panel shall be equipped with a keypad and a 25 character two row alpha numeric display, at a minimum. The display and keypad shall be vandal proof.

   The display shall be capable of being read under all lighting conditions. The keypad and display may be combined into one touch screen display if approved by the Administration.

   The operator control panel shall be equipped with a connector for the connection of a portable memory transfer unit. The connector and memory transfer unit shall be approved by the Administration during the design reviews.

   The MARC III operator's control panel shall be installed in the same location as the existing operator control panel.

   The keypad shall be placed at a suitable height for easy operation.

   The operators control panel shall allow the train crew in control the AAS functionality and allow access to diagnostic control functions from any vehicle in a train consist. The control of message display throughout the train shall be accomplished over the data network.

   The Control panel shall allow the train crew to perform the following functions from any point in the consist:

   1. To enter the train number which will be used to select the current train route and station announcements. The current train number shall be stored in non-volatile memory so that in the event of a power interruption the system will automatically continue to function when the power is restored.

   2. To program all side signs, and interior signs with different messages from any operator's display keypad.

   3. To initiate any prerecorded audio message to be played throughout the train consist.

4. To resynchronize the location of the train in the event that the system does not have the correct train location.

5. Modify on-board route and station sequence information

6. Adjust on-board announcement volume (password protected)

7. Access system diagnostic tools (password protected)

8. To permit the train crew to disable the sign messaging via the operators control panel in the event of a system fault. The sign may default to either a fixed message or a blank.

The Control panel shall be capable of displaying the following information:

1. Train Number

2. Next Station Name

3. General health information (GPS available, time and date, etc.)

The design and operation of the operator's control panel shall be included in the Communications Overall Overhaul Plan.

**J.** **GPS Receiver and Antenna.** The contractor shall supply and install a separated DGPS receiver and antenna. Should the Contractor provide a separate DGPS receiver and antenna, the following requirements apply.

The Contractor shall provide a Differential Global Positioning System (DGPS) receiver and antenna. The DGPS receiver shall be Wide Area Augmentation System (WAAS) and differential beacon-capable. The system shall utilize the GPS mode with the lowest Dilution of Precision available at each moment in time.

The GPS receiver may be installed as part of sign control unit, or operators control panel. The antenna shall be a combined GPS and data modem antenna with a low profile that shall not exceed the clearance envelope of each type of vehicle in the fleet.

The GPS data shall be used to trigger the automatic station announcements.

**K.** **Wireless Modem and Antenna.** The data modem shall be CDMA/1xEV-DO of a type approved by the Administration and supported by at a minimum two wireless data service providers in the area that the Administration will operate the trains.

The Wireless modem may be installed as part of sign control unit, or operators control panel.

The antenna shall be a combined GPS and data modem antenna with a low profile that shall not exceed the clearance envelope of each type of vehicle in the fleet.

The wireless modem shall be used for all train to wayside communications. The wireless modem design and installation should be such to allow updates to alternative modems without requiring software upgrades of any on-board systems.

**L.** **Speed Sensors.** The Contractor shall supply and install an active speed sensor and cabling as required.

The speed sensor shall be designed and produced to comply with Section 6 of EN 50155.

The sensor shall utilize a threaded installation to the supporting apparatus. The thread shall be 0.625-18 UNF-2A. A hex-shaped jam nut, 1/4-in. high, shall be furnished with the speed sensor to lock it in place. Wrench flats shall be provided on the sensor body to allow holding the sensor body while the jam nut is tightened. The Supplier shall specify torque limit for the wrench applied to the sensor body.

The speed sensor shall withstand ± 100 g acceleration in any axis without damage or loss of service life.

The speed sensor shall be designed for a fatigue life of 107 cycles under loads produced by ± 50 g acceleration in any axis.

The sensor design shall accommodate a reasonable run-out in the gear wheel used for sensor excitation and shall allow, to the extent practicable, some lateral offset of the tooth and the sensor pole face. The Contractor shall specify the requirements for the air gap between the pole face and exciter tooth, subject to the Administration's approval. The intent is for the sensor to operate at gaps up to 0.10 in. (2.5 mm). The pole wheel exciter for the sensor will have a diametral pitch, DP = [(no. of teeth + 2)/(outside diameter of wheel in inches)] 11-1/4. The sensor must operate successfully with an air gap between 0.025 and 0.050 in.

The sensor case shall be constructed of 303-grade stainless steel. The sensor shall be environmentally sealed. Combined with the electrical connector, the sensor shall meet or exceed the protection code of IP66 (IEC) or type 4X (NEMA). The pole face end of the sensor shall be sealed and the sensor assembly shall not be affected by repeated thermal cycling between the specified temperature limits.

The electrical connections shall be by a multi-pin connector conforming to MIL-C-5015 or Buyer approved equal. Electrical contacts shall be 30 mil gold plate over 50 mil low stress nickel. Wire connections to the connector shall be soldered and potted. There shall be no electrical connection of the two shields within the sensor or the connector. It is acceptable to have two galvanically isolated channels, with the

power supply inputs connected external to the sensor, within the interface connector.

The sensor shall be designed to meet the environmental requirements specified in IEEE Std 1478, for condition E1.

The sensor shall operate in any ambient temperature between –40C to 120C without any adverse affect on service life.

The speed and distance calculations shall be based on nominal 34.5 inch wheel diameter with a 100 tooth gear. Actual wheel diameter is 36 in. new and 33 in. worn; the maximum car speed is 125 mph.

The speed sensor shall be mounted on the trailing axle (axle number 2) of the F end truck in the existing mounting hole unless approved by the Administration.

The speed sensors shall be used to determine train location when the GPS data is not available. The speed sensor output will provide vehicle speed and direction. At the contractor's option, inertial navigation can be used as an alternative to or in addition to the installation of the speed sensor.

**M. <u>Networks.</u>** The contractor shall provide the following data networks to allow the AAS to transfer data from one vehicle to another within the consist and to each destination sign.

The MARC III trains are equipped with two networks. The train network, which communicates between the cars in a consist, is a Lonworks powerline network based on the PLT10a transceiver which is now obsolete. The sign network is based on the RS-485 protocol.

The contractor shall propose a new train network to provide compatibility with the MARC IV cars, which may be used in a mixed consist environment. In these instances, it should not be necessary to program multiple sign controllers for proper operation of the destination signs.

The contractor may utilize the existing RS-485 sign network or propose an alternative network design.

All networks shall be design to have adequate capacity. The contractor shall provide a network traffic analysis to show that no more than 25% of the networks capacity is unitized at any time.

All networks shall have a maximum of 200 ms inauguration or re-inauguration time and shall automatically re-inaugurate if one node is non-responsive. The network

shall automatically re-inaugurate when there is any change in the number of nodes on the network (e.g., a car is added or removed from the consist).

All networks must be an open network non-proprietary design to allow the Administration to, at a later date, to purchase equipment that will be compatible with these networks and data structures. The networks chosen shall be designed to be immune for electromagnetic interference and transients.

The Contractor shall provide a non-proprietary open Interface Control Document (ICD) describing all aspects of the networks. The Contractor shall provide a detailed verification and validation test procedure to prove the ICD is complete. **[CDRL 1203]**

The system shall be operated from any operator's display keypad located in a cab car.

It shall be possible for only one (1) operator's display keypad unit on the train to be in use at any given time to select messages. It shall be possible to program all side signs, interior signs, and front signs with programmed messages from any operator's display keypad. The design of the destination sign system, including location and operation, shall be included in the Communications Overall Overhaul Plan.

Provision shall be included in the AAS to permit the train crew to disable the sign messaging in the event of a system fault. The sign may default to either a fixed message or a blank.

**N.** **Memory Transfer Unit.** A standard MS Windows compatible PC shall be used to update the message listing and all memory devices in the sign control units in each vehicle through the use of a PCMCIA card or USB memory device. It shall also be possible to update the system through the wireless link.

Software programs shall be provided, which shall enable authorized MARC personnel to change the message and voice databases using a standard PC.

The message listing created in the computer shall be transferred directly to each sign control unit via a PCMCIA card, USB memory device, or wireless link.

The resulting modified database in that vehicle shall remain in force until locally updated further or upon the implementation of the next fleet wide update, at which time, the locally unique database will be overwritten by the latest fleet wide update.

**O.** **Audio Announcements.** The AAS shall be designed and interface to each vehicle type's existing PA system in such a way that it meets the following requirements:

A. Shall not interfere with any of the existing functionality.

B. Audio volume of the announcements will be constant throughout the consist regardless of the consist's length of makeup.

C. Has the following performance characteristics:

1. Frequency Response: ±3 dB minimum from 80 Hz to 8,000 Hz
2. Total Harmonic Distortion (THD): less than 1% over entire frequency range
3. Signal to Noise Ratio > 100: 1
4. There shall be no pop or click sound when a message is started or ended.

D. Messages will be given the following priority:

1. Manual crew initiated messages.
2. Wayside initiated messages.
3. Station and route messages.

## 12.4 REQUIRED CDRLS

1201 Contractor shall submit the Communications Overall Overhaul Plan to the Administration.

1202 Wayside to Train Communication System Vulnerability Assessment

1203 A complete set of all interface control documents and detailed verification and validation procedures for the Communication System.

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# QUALITY ASSURANCE

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# SECTION 16
# QUALITY ASSURANCE

## 16.1 GENERAL SYSTEM DESCRIPTION

The Contractor's Quality System efforts shall be in compliance with the requirements of ANSI/ASQ Q9001-1994. Where it differs from the terms of the Contract, the more stringent requirement shall take precedent. The Contractor need not be certified under ANSI/ISO/ASQ Q9001-2008 or latest revision.

The Contractor shall establish, implement and execute a comprehensive system to assure that all aspects of the work are in conformance with the Administration's contract. The Quality System shall include the Contractor's Quality System Manual, Quality Plan, and all implementing manuals, processes, and procedures. The Quality System Manual shall state the Quality Policy, definition of responsibilities, and authority of personnel who manage and perform work affecting quality. It shall include all procedures for implementing the required ANSI/ISO/ASQ Q9001-2008 or latest revision standard.

The Administration reserves the right to perform required and/or continuous quality inspections at the Administration's discretion during the Contractor's execution of the Contract to ensure that the Contractor is meeting all of its Quality System requirements. The inspections will be performed independent of and in addition to the Contractor's quality assurance (QA) functions. These monitoring functions will confirm that Deliverables and Submittals under the Contract conform to the Specification as well as Administration-approved Contractor drawings and documentation. The Administration's quality control activities will in no way waive, abrogate, replace, negate, override, or lessen the Contractor's quality and other obligations under the Contract.

The Contractor's Quality System shall be subject to Administration verification at any time. Administration Inspectors shall have free access to the Contractor's/Subcontractor's facilities during all normal business hours and when work is in progress.

The Quality System shall be consistent with documents, including sample Quality System Manuals and Quality Plans, submitted by the Contractor and approved by the Administration

## 16.2 SOFTWARE QUALITY ASSURANCE

The requirements of this section shall apply to those new subsystems that utilize proprietary computer software to control their function. The Contractor shall submit, for approval, a Software Quality Assurance Plan in accordance with IEEE/ANSI Standard 730. ***(CDRL 1601)*** The plan shall include the submittal and approval of the documents listed below:

A. System Functional Description
B. Software Requirements Specification
C. Software Design Description
D. Software Verification and Validation Plan
E. Software Verification and Validation Report

F. User Documentation

The Software Design Description (SDD) shall be in accordance with ANSI/IEEE Standard 1016. The final Software Design Description shall include details required by ATA Specification No. 102, through all levels to level 6. Level 4 shall be interpreted to mean all source code, including operating systems. The levels defined in ATA No. 102 are summarized below only for information:

Level 1: Computer description and operation
Level 2: Software architecture, basic program and functions
Level 3: Detailed flow information
Level 4: Annotated compiler/assembly listing
Level 5: Detailed memory map and listing
Level 6: User documentation

After original approval, changes to the software shall be formally submitted for approval by the Administration, prior to implementation. The software documentation shall be revised concurrently with software changes.

## 16.3 QUALITY SYSTEM MANUAL

The Contractor shall establish and maintain a written Quality System Manual and procedures defining its Quality System. The procedures shall include, but not be limited to, the control of subcontractors, receiving inspection, discrepancy control, design control, production and process control, configuration control, software configuration control, functional test, drawing control, calibration/certification program, shipping inspection, QA/QC records, Contractor activity at the acceptance site or on the Administration's property, and any other quality provisions needed to meet the requirements of the Contract.

## 16.4 QUALITY PLAN

### 16.4.1 Submittal

Within 15 calendar days after Notice to Proceed, the Contractor shall develop and submit to the Administration for approval, a Quality Plan that defines the system elements required to regulate methods, procedures, and processes to ensure compliance with all Contract requirements. ***(CDRL 1602)*** If deficiencies are found during the assessment of the Quality Plan, corrective action shall be implemented and documented by the Contractor as a condition of having the Plan approved.

### 16.4.2 General Requirements

The Quality Plan shall illustrate how the Contractor intends to meet the Quality System requirements of the Specification and shall include as a minimum:

A. An organizational chart, including definition of the responsibilities of the Contractor's key management, project and line personnel. Also to be included are organizational charts for major subsystem suppliers.

B. Flow charts of paperwork for documenting the acceptance or rejection of material and the disposition of unacceptable material, for defining accountability for material found defective or malfunctioning during production conformance testing, and for configuration verification for items to be included in the Vehicle Overhaul History Books.

C. A Material Review Board (MRB) or approved equivalent.

D. The methods and procedures used to control daily manufacturing processes and material quality.

E. Forms used to convey, track, and account for design changes implemented in the vehicles regardless of their state of completion, and any other forms necessary for the Quality Plan. Each form shall be provided with a serial number.

F. Flow charts that show paperwork flow which documents the approval of new or upgraded component design.

G. The Plan shall include a manufacturing schedule indicating the Contractor's plant location, and the work to be performed for its own operations and those of major subcontractors. When work is scheduled to be accomplished at different locations, the Contractor's manufacturing schedule shall clearly identify each location and the work to be accomplished therein. All work shall follow the Contractor's manufacturing schedule and shall not be moved from one plant to another without the Administration's written approval. All systems completed at a given site shall be demonstrated to be functionally operational before shipment to another site.

### 16.4.3 Audits

The Administration-approved Quality Plan and all implementing manuals, processes, and procedures will be subject to periodic audits by the Administration. The Administration reserves the right to visit the Contractor's facility, prior to approval of the Plan, to perform an audit of the effectiveness of the submitted Quality Plan.

### 16.4.4 Inspection and Test Schedule

The Inspection and Test Schedule shall show major manufacturing, inspection, and test milestones on a schedule that includes planned dates for submittals. The Inspection and Test Schedule shall identify all inspection or test witness and hold-points in accordance with TS Section 16.5. The Inspection and Test Schedule will be used by the Administration to ensure the Contractor's commitment to product quality and compliance with all Contract requirements. The Inspection and Test Schedule shall include a rectifying feedback system to the Contractor's engineering and production groups. The Quality Plan shall include a schedule/matrix of testing and inspection keyed to the Special Provisions and Technical Specification of the Contract and covering each item of the work in accordance with the Specification requirements.

## 16.5 QUALITY PLAN – DETAILED REQUIREMENTS

### 16.5.1 Management Responsibility

The Quality System organization structure of the Contractor, Subcontractors, and Suppliers shall be clearly defined and independent from the manufacturing unit. The management responsibility for the QA function shall be set forth in the Contractor's policy and organization chart. The QA manager shall have sufficient authority and organizational freedom to insure that a non-conforming or discrepant product will not be delivered to the Administration. The Contractor shall ensure that the Quality System is understood, implemented, and maintained at all levels of the organization. The responsibility for the QA function shall be so placed within the Contractor's own organization such that the quality of products delivered under the terms of this Contract shall not be compromised in order to meet schedule and cost projections. Any conflicts that arise as a result of this provision shall be brought to the Administration's attention by the Contractor's QA Manager and shall be resolved to the Administration's satisfaction prior to shipment of affected items.

The Contractor's executive management shall review the Quality System at defined intervals using the ASQ/ISO 9000 series Standards and the Contractor's stated quality policy and objectives to ensure the continued suitability and effectiveness of the Quality System.

### 16.5.2 Contract Review and Change Control

The Contractor shall establish procedures to review and amend the Contract via a change control system.

### 16.5.3 Design Control

Written procedures shall be implemented by the Contractor for control of the entire design process including design validation and changes. These procedures shall ensure that Specification design requirements are correctly translated into drawings and specifications used for procurement, manufacture, and test. The Contractor shall implement procedures for transmission of design and quality requirements and standards to subcontractors and suppliers to assure compliance with Contract requirements.

The Contractor shall establish and maintain objective evidence of compliance with all of the requirements of the procurement specifications and design control procedures.

The Contractor shall provide procedures for the evaluation of proposed changes to design drawings and Specifications, ensuring that there is complete compliance with Contract requirements for proposal, approval, and implementation of engineering changes. The Contractor shall be responsible for all drawings and engineering changes presented by subcontractors and suppliers.

The Contractor shall implement a Configuration Management Plan that maintains and assures the latest drawing configuration. The Contractor shall ensure that requirements for the effectivity point of changes are met and that obsolete contract drawings and requirements are promptly removed from the system. Means of tracking the effectivity points for design change,

retrofits, upgrades and field modifications shall be employed and made available to the Administration to verify latest vehicle configuration.

### 16.5.4 Document and Data Control

The Contractor shall establish and maintain procedures to control all documents and data related to this Contract. The Contractor shall also be responsible for all documents and data generated by suppliers and subcontractors related to the Contract. There shall be procedures by which the documents and data will be reviewed and approved. A document control list shall be maintained providing current status of design documents and drawings. All revisions or changes to documents and data shall be reviewed and approved by the same individual or group that performed the original review.

### 16.5.5 Purchasing

The Contractor shall outline the methods to be used for selection and control of subcontractors and suppliers. The Contractor shall be responsible for ensuring that all supplies and services procured conform to Contract requirements. The effectiveness and integrity of quality control by the subcontractors shall be reviewed and assessed by the Contractor at intervals consistent with the product complexity and quality.

The Administration reserves the right to inspect, at the source, any supplies furnished or services rendered under the Contract. The Contractor shall support and facilitate the Administration's efforts to contact manufacturers, subcontractors, or suppliers for the purpose of discussing, among other things, schedule, design, or quality issues. When the Administration elects to inspect at a subcontractor's facility, such inspection shall not be used by the Contractor as evidence of effective quality control of the subcontractor.

It is the Contractor's responsibility to ensure that the subcontractor's product meets all the requirements of this Specification. The Contractor shall ensure that the subcontractors and suppliers are cognizant of all pertinent Specification requirements. Purchase order requirements shall ensure that the subcontractor must notify and obtain approval for design changes from the Contractor and for requests for certificates of compliance (where applicable) prior to implementation.

### 16.5.6 Control of Administration-Supplied Product

The Contractor shall establish and maintain documented procedures for the control of verification, storage, and maintenance of Administration-supplied product, if any.

The Contractor shall also establish procedures to ensure that Administration-supplied material and equipment is handled, secured, and incorporated into the vehicle in accordance with the terms of the Contract. These procedures shall include receipt inspection; and retention of material certifications.

The Contractor shall document accountability for receipt, consumption or return of parts supplied by the Administration.

### 16.5.7 Product Identification and Traceability

The Contractor shall establish and maintain procedures for identification and control of product. Product shall include batch, materials, subassemblies, and components. The procedures shall be used to prevent the use of incorrect or defective items, ensure that only correct and acceptable items are used or installed, and that current configuration is maintained. Manufacturing history of items shall be documented on paper forms or in on-line electronic files, such that the manufacturing status of parts and assemblies can readily be determined as they are processed. Any document or data files which trace items throughout receipt, storage, fabrication, repair, and shipment shall be retained and shall be subject to inspection by the Administration.

### 16.5.8 Process Control

The Contractor, subcontractors, and suppliers shall provide control of manufacturing and production processes that directly affect quality and product configuration through the use of a formal manufacturing schedule. This schedule shall be compatible with the approved inspection schedule and will show each significant operation and the related control/hold points for inspections, examinations and tests.

Hold-points shall be established by manufacturing such that in no case will work be hidden from inspection or test by subsequent assembly. All corrections shall require re-inspection and appropriate testing prior to advancement of work.

Manufacturing and production processes shall be performed and controlled using qualified personnel and procedures in accordance with industry codes and standards and Specification requirements. These processes shall include, but are not limited to, welding, heat treating, and non-destructive testing.

Manufacturing and production conditions that adversely affect product quality shall be identified, and eliminated. Evidence of corrective actions to prevent recurrence of such conditions shall be verified and documented.

The manufacturing schedule shall also identify activities that control or verify the qualification of personnel during all stages of design, procurement, manufacturing, fabrication, and testing.

### 16.5.9 Inspection

The Contractor shall establish formal inspection procedures. Inspection procedures shall be submitted to the Administration for approval prior to implementation. All inspections shall be performed to demonstrate compliance with Specification requirements, identify deficiencies and confirm the elimination of deficiencies.

The procedures shall provide detailed instructions for the performance of inspections, documentation of results, acceptance criteria and disposition and treatment of non-conforming items. Instructions for publication and retention of the results and final report shall also be defined.

If the Contractor employs the services of outside inspection facilities, it shall assure that outside services contractors demonstrate compliance to the appropriate industry standards and the Specification requirements. Outside services contractors' certification of compliance with industry standards and Specification requirements shall be submitted to the Administration for approval, prior to acceptance of services performed.

### 16.5.10 Inspection, Measuring, and Test Equipment

The Contractor shall ensure that inspection, measuring, and test equipment is identified, controlled, calibrated, and maintained in order to demonstrate the conformance of work to Specification requirements.

The Contractor, subcontractors, and suppliers shall demonstrate an effective time- or usage-cycled calibration/certification program. Validity of measurements shall be ensured through the use of suitable inspection, measurement, and test equipment of the range and type necessary to determine conformance of items with Contract requirements. Tooling and fixtures used as a medium of inspection or manufacture shall be included in this program. At intervals established to ensure continued validity, measuring devices shall be verified or calibrated against certified standards traceable to the National Institute of Standards and Technology or approved equivalent. Every device verified shall bear an indication showing current status and date for re-calibration. All calibration certifications shall be recorded and become part of the QA/QC records. In no case shall the Contractor use test or measuring equipment that bears an expired calibration stamp.

### 16.5.11 Inspection and Test Status

The Contractor shall provide the means to identify the inspection and test status of work during production and installation. The system shall be capable of identifying the progressive inspection status of components or materials as to their acceptance, rejection, or non-inspection status. This system shall ensure that only work that has passed the required inspections and tests is accepted. Non-conforming items shall be identified by physical segregation and status indicators such as markings, serialization, tags, stamps, and inspection records.

### 16.5.12 Non-Conforming Material

The Contractor shall establish and maintain an effective system for controlling non-conforming material, including procedures for its identification, segregation and disposition. Dispositions to use "as-is" or repair of non-conforming material shall require the Administration's approval. All non-conforming material shall be positively identified to prevent unauthorized use, shipment, or intermingling with conforming material. Holding areas and procedures, mutually agreeable to the Contractor and the Administration, shall be established by the Contractor.

Product that does not conform to the specified requirements shall not be incorporated into the work without the express written approval of the Administration. Each such request for approval must be submitted in a formal proposal signed by the Contractor's program manager, project engineer, and quality representative.

The Contractor shall establish a Material Review Board (MRB), or equivalent review procedures, for non-conforming material that will identify the causes of defects, disposition of defective material, and recommend corrective actions to prevent recurrence, including verification of the effectivity of the corrective actions. The MRB shall include one Administration representative. The procedures shall identify all Contractor representatives and/or departments responsible for this review. The MRB shall have sufficient authority to make disposition of non-conforming product without interference or reprisal from its own management. A summary report on non-conforming material shall be issued on a monthly basis.

### 16.5.13 Correction and Preventive Action

The Contractor shall establish and maintain procedures for implementing corrective and preventive action. The Contractor shall implement and record any changes to the documented procedures resulting from corrective and preventive action.

Corrective action and related information shall be documented and made available to the Administration upon request. Corrective action shall extend to all subcontractors and suppliers and include, at a minimum:

A. Analysis of data and examination of discrepant products to determine extent and causes

B. Introduction of required improvements and corrections, initial review of the adequacy of such measures, and monitoring of the effectiveness of corrective action taken

C. Analysis of trends in processes or performance of work to prevent non-conforming products.

### 16.5.14 Handling, Storage, Packaging, Preservation, and Delivery

Written procedures shall be established to assure that items are handled, stored, and shipped in such a manner to prevent damage and loss. There shall be instructions for identification markings, precautionary signs, protection against weathering and corrosion, drying agents, moisture barriers, electro-static discharge, and control of shelf life.

### 16.5.15 Records

The Contractor shall establish procedures to maintain and control records required to furnish evidence of activities affecting quality. These procedures shall include a QA/QC records list that will define which records will be kept. The procedures will also identify responsibility for production, collection, indexing, filing, storage, maintenance, and disposition of quality records.

Adequate records shall be kept to provide evidence of quality and accountability. These records shall include results of examinations, inspections, tests, process controls, certification of processes and personnel, non-conformance (including disposition), calibrations, corrective action, audits and any other quality requirements defined in the Contract. The records shall be complete and available for review by the Administration as provided under the Contract.

Exceptions taken to the quality of workmanship on the vehicle, inclusive of all subsystems, components, and materials by both the Contractor's and Administration's inspection representatives shall be posted in a manner convenient to review at or on the affected vehicle. The rejection/approval status of each exception shall be readily determined throughout the vehicle's manufacturing cycle and shall be kept current by the Contractor's inspection force on a routine, daily basis. This exceptions document shall be included in the QA/QC record list.

The Contractor shall retain copies of all records and make them available to the Administration for a period of a minimum of seven (7) years after expiration of all warranty periods, unless otherwise specified.

### 16.5.16 Quality Audits

The Contractor shall submit a comprehensive system of planned and periodic audits. The audits shall be carried out by the Contractor to verify compliance with and effectiveness of all aspects of the Quality System. The audits shall be performed at predetermined periods by qualified personnel not having direct responsibilities in the areas audited. The documented audit results shall be reviewed by the Contractor's management personnel having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be as determined by the Contractor and reported to the Administration. Audit reports and follow-up action reports shall be available to the Administration for review and approval no later than 10 calendar days after each audit.

Audits of subcontractors and suppliers shall be made by the Contractor and may be witnessed by the Administration at the following times during the execution of the Contract work:

A. As a condition of the subcontract or purchase order, prior to the start of any work.

B. Within a 30 calendar-day period prior to formal acceptance by the Contractor of the first article inspection or services being supplied by the subcontractor or supplier.

C. When the supplier or supplier facility manufacturing the product has changed.

D. When re-certification is warranted due to unacceptable performance, such as product non-conformance, schedule impact, or cost overruns are encountered.

Non-conformance with any part of the approved Quality Plan will be cause for rejection of the Contract work. Any schedule delays caused by non-conformance with the approved Quality Plan, whether by the Contractor, its manufacturers, subcontractors or suppliers, will not serve as a basis for an extension of time under the Contract.

The Administration reserves the right to conduct independent audits of the Contractor's Quality System for its effectiveness at any time. This audit shall include the Contractor, subcontractors, and suppliers. The Contractor shall take prompt action to resolve problems and obtain approval by the Administration. At a minimum, QA audits of the Contractor will be made at the following times during the course of the Contract at the Administration's option:

A. Prior to the start of production of the first vehicle.

B. Within a 30 calendar day period prior to formal acceptance of the first vehicle.

C. When the supplier or supplier facility manufacturing the product has changed.

D. When re-certification is warranted due to unacceptable performance, such as product non-conformance, schedule impact, or cost overruns are encountered.

All QA audits shall judge and report on the degree of compliance with approved procedures prepared by the Contractor. Audit reports shall be prepared and submitted within 10 days following any audits conducted by the Administration. The audit report will describe the scope of the audit; the procedures used; a statement of all deficiencies found, keyed to the approved Quality Plan; the corrective action required for each deficiency found; and the date by which corrective action will be completed. The Contractor shall prepare a report in a similar manner for each audit conducted by it and shall submit a copy to the Administration and to the audited organization.

Each audit shall require a formal written response by the Contractor within 10 days of receipt of the initiating Administration audit report. Responses shall fully describe the methods and timetable by which compliance will be achieved and demonstrated. Contractor audit responses will be subject to the Administration approval.

### 16.5.17 Personnel Qualifications and Certifications

Contractor personnel performing inspections and tests shall be qualified for such work by virtue of prior experience and training, and verified by testing where applicable. Manufacturing personnel performing processes such as welding and brazing shall be currently certified for such work. Manufacturing personnel performing all other work shall be experienced for the task being performed. Records of personnel certification and qualifications shall be maintained and available for the Administration's review.

### 16.5.18 Statistical Techniques

The Contractor shall identify the need for statistical techniques that will be used for the Contract requirements. Sampling plans used by the Contractor shall be fully documented and based on generally recognized and accepted practices. Statistical quality control applications used in acceptance of parts, materials, and/or processes by the Contractor shall be submitted to the Administration for approval.

The Contractor may use certificates of compliance, with a certified copy of test results, for materials and products in lieu of specified sampling and testing procedures, as approved by the Administration. All evidence of compliance shall be preserved and shall be available to the Administration upon request. All certificates of compliance shall identify, at a minimum, the part number, serial number, and batch or heat number. The certificate shall be signed by an

authorized representative of the Contractor or subcontractor, stating that the equipment or material complies in all respects with Contract requirements and industry standards.

## 16.6 QUALITY SYSTEM PROCEDURES

The Contractor shall develop procedures to assure effective implementation of the QA/QC activities for this Contract. At a minimum, the following procedures shall be included in the Contractor's Quality System Manual for use in the Quality Plan:

A. Design control, including control of all technical documentation

B. Transmission of all QA/QC requirements to procurement sources

C. Surveillance of subcontractors and suppliers for conformance with all Specification requirements

D. Receiving inspection, in-process inspection, and final inspection

E. Production and process control

F. Operator certifications and qualifications

G. Functional testing

H. Discrepancy control

I. Discrepant Material Disposition

J. Corrective action

K. Measuring and test equipment calibration and certification

L. Drawing control

M. QA/QC records and record retention

N. Shipping inspection

O. Selection of qualified procurement sources

P. Evaluation and assessment of subcontractor's Quality System

Q. Monitoring of subcontractor QA/QC performance

R. Evaluation of procured articles against purchase order requirements

S. Feedback of problems and their resolutions to the Contractor's engineering and production departments

T. Material Equipment Certification and Test Reports

U. Mill and laboratory testing and reporting.

## 16.7 INSPECTION REQUIREMENTS

During vehicle overhaul, the Contractor shall provide inspection points at all critical stages manufacturing operations, and test to monitor production progress and adherence to Contract requirements. There shall be sufficient inspection points to ensure that non-conforming material or product does not enter or remain in the production process.

The Contractor shall inspect and physically or functionally test all items to be delivered under the terms of this Contract. Inspection shall occur at appropriate points in the manufacturing sequence to ensure compliance with drawings, process and test specifications, quality procedures and standards. Non-conformance shall be documented and corrected according to TS Section 16.5.12. Discrepant material review results and recommendations shall be documented and corrective action taken according to TS Section 16.5.13.

The Contractor shall ensure that inspections are performed on the latest approved design. When modifications, overhauls, or replacements are required, there shall be a reinspection of the affected items. All inspection procedures shall provide for reporting deficiencies or questionable conditions to the Administration.

Typical inspection points are identified in the sections that follow. The Administration's participation in or witness to any or all of these inspections shall be at the Administration's discretion and shall in no way alleviate the Contractor's responsibilities for such inspections.

### 16.7.1 First Article Inspections

First Article Inspections (FAI) shall be required for selected overhauled equipment, and all new and upgraded systems, assemblies, and subassemblies, which are furnished by the Contractor and subcontractors.

At a minimum, the following shall be subject to a formal FAI:

A. Trucks
B. Wheel/Axle assembly
C. Battery Charger

Within 30 days after NTP, the Contractor shall provide to the Administration a list of items subject to FAI ***(CDRL 1603)*** and based on the approved overhaul schedule. The list shall provide notification of no less than 15 days in the U.S. and 30 days outside the U.S. for any scheduled event. The list shall be updated and issued monthly.

The Contractor shall conduct the FAI at the point of manufacture on the first piece, component, assembly, or system constructed using production tooling and conditionally approved or approved design drawings. A procedure shall be submitted by the Contractor and approved by the Administration prior to conducting the FAI.

The FAI shall establish the quality of workmanship for the balance of like components and evaluate component and system maintainability where possible. Photographs shall be taken to document the results of the FAI. Three sets of photographs shall be forwarded to the Administration, with a minimum of one set to be retained by the Contractor. Any subjective characteristics noted during the FAI shall be evaluated and criteria for inspection shall be agreed to, jointly, by the Administration and the Contractor. Whenever possible, the Contractor will retain at least two sets of samples to inspect subjective characteristics, such as color, finish, or texture. The approval status of samples shall be clearly visible and easily authenticated. Samples are to be retained in a secure place. At a minimum, the following shall be required to perform an FAI:

A. A complete set of drawings approved or conditionally approved by the Administration.

B. Material certifications.

C. Vendor certifications, as required.

D. Inspection forms that control in-process work.

E. Proof that all required testing has been performed in accordance with the Approved Inspection and Test Plan and the results satisfy specification requirements.

F. A Contractor pre-FAI final inspection report to assure readiness of the first article.

G. Tools and labor required to perform inspection and test.

H. Tools and labor for required disassembly and removal of covers, etc.

I. Equipment and labor required to perform functional test, if required.

J. The inspection article shall be displayed in an accessible, well-lit space to allow ease of inspection.

K. FAI procedure submitted to the Administration for approval 30 days in advance of the first FAI.

The Contractor shall not be permitted to schedule more than one (1) FAI per day without the prior written approval of the Administration.

### 16.7.2 Receiving Inspection

Receiving inspection activity shall provide for the inspection of all incoming material. Written procedures shall be implemented to assure items are inspected upon receipt to verify conformance to acceptance criteria of specifications, drawings, and purchase orders. All material certifications and test reports used as the basis for acceptance by the Contractor shall be preserved. A material identification system shall be used to preclude the use of incorrect or noncompliant materials during manufacture.

### 16.7.3 In-Process Inspection

The Contractor's Quality System shall ensure that all production operations, together with all processing and fabrication of any type, shall be performed under controlled conditions. Controlled conditions shall include documented work instructions, adequate production equipment, and any special working environment. The Quality System shall effectively monitor the issuance of and compliance with all of these work instructions. Inspection procedures shall be used where applicable. Inspection shall be accomplished in a systematic manner selected by the Contractor, subject to audit and surveillance by the Administration.

### 16.7.4 Hold-Point Inspection

The Contractor shall establish hold points in the teardown and production process to provide the most critical form of inspection. Hold points shall be utilized to inspect completed operations or installations. Hold points shall also be used to inspect items that are about to be covered by succeeding assembly operations. A list of hold-point inspections shall be submitted to the Administration for approval. Non-conforming products shall not be released from a hold point area until all discrepancies have been corrected. The Contractor shall use inspection forms to document all discrepancies found. The inspection forms shall be posted at or near the point of inspection for each vehicle and included with the Vehicle Overhaul History Book when all discrepancies have been eliminated. The Contractor shall submit a list of hold-point inspections to the Administration for review and approval.

The Contractor shall submit a list of hold point inspections to the Administration for review and approval. ***(CDRL 1604)*** The list of hold points shall include both surveillance and mandatory hold points that will be enforced by the Contractor staff. The Administration reserves the right to jointly witness any and all hold point inspections. In addition, the Administration retains the right to add up to five additional hold points, at its discretion, any time during the Contract. The additional hold points that may be required by the Administration, may be added or removed at the Contractor or its subcontractor facility, and shall be at the Administration's sole discretion.

### 16.7.5 Pre-Shipment Final Inspection

After factory testing and prior to shipment, the Contractor shall present each vehicle to the Administration for inspection. Before the Administration's final inspection, the vehicle shall be completed, final inspected, and accepted by the Contractor's QA/QC Department. All

workmanship items covered by prior inspection reports shall be corrected and all production and functional testing completed before final inspection begins. During the final inspection, all Contractor and subcontractor personnel shall vacate the vehicle, except as provided below. All Contractor inspection reports shall be made available to the Administration's inspectors at the time of final inspection.

The Contractor shall provide a qualified individual to accompany the Administration representative during final inspection. The Contractor's representative shall have the authority to assure that proper corrective action is taken. The Contractor shall provide labor and tools to remove or open and re-apply covers and doors. During final inspection, all systems shall be operational, with the use of approved types of special equipment or power supplies, where necessary.

### 16.7.6 Shipping Inspection

The Contractor's Quality System shall provide for the proper inspection of product to ensure completion of manufacture prior to shipment. Written procedures shall be prepared to ensure that all shipments shall be adequately prepared to preclude damage during shipment. These procedures shall include vehicle shipping preparation instructions and inspection procedures for vehicles scheduled for shipment to the acceptance site.

### 16.7.7 Outbound and Inbound Inspection

A joint outbound inspection shall be conducted by both the Contractor and the Administration to document the condition of each vehicle as it leaves the Administration's property. The Contractor shall conduct an inbound inspection with the Administration's resident inspector present at the Contractor's facility to confirm the results of the outbound inspection. Both the Contractor and Administration representatives shall sign off on the results of each inspection. The Contractor shall be responsible for preparing the inspection form for both the outbound and inbound inspection and shall submit it to the Administration for approval. Any equipment or items that are found to be missing after the completion of the outbound inspection will be the responsibility of the Contractor.

### 16.7.8 Post-Shipment Inspection

The Contractor shall conduct a receiving inspection on each vehicle upon arrival of the vehicle on Administration property. At its sole discretion, the Administration may choose to accompany the Contractor's inspector during this inspection. The results of the inspection shall be documented and included in the Vehicle Overhaul History Book. All discrepancies identified as having occurred during the shipping process shall be corrected according to TS Section 16.5.13.

### 16.7.9 Pre-Acceptance Final Inspection

After all post-shipment testing has been completed, the Administration shall conduct a final inspection.

## 16.8 MODIFICATION/RETROFIT PROGRAM

The Contractor shall develop a Modification Schedule to effect and inspect retrofits or modifications made to vehicle at the Contractor's site and on the Administration's property. When a retrofit or modification is made by the Contractor, it shall be to the entire fleet in kind, or, if approved by the Administration, on an effective vehicle basis. The Contractor's Quality Control shall verify and document the completion status of all current modifications at the time of final inspection. The Modification Schedule shall detail how activities will be coordinated among the various responsible parties to ensure that all required activities are accomplished. The Contractor shall also develop a matrix of all modifications performed and to be performed. The Modification Schedule matrix shall be updated and submitted to the Administration monthly.

## 16.9 SUBCONTRACTOR INSPECTION

Inspection of subcontractor products and materials shall be conducted at the subcontractor's facility.

The Contractor shall provide to the Administration a list of vendor items subject to FAI. This list shall include the projected schedule dates for each event. FAIs shall be performed in accordance with requirements in TS Section 16.7.1.

Once a product has been approved at FAI, the subcontractor may begin shipment of product to the Contractor's facility. Subcontractor pre-shipment inspections shall be scheduled prior to each shipment. The Contractor shall notify the Administration at least 30 days in advance of any shipment to allow the Administration to make travel arrangements. The subcontractor shall be required to provide similar inspection elements as defined for FAIs in TS Section 16.7.1, the only exception is that the pre-FAI inspection report identified in TS Section 16.7.1 shall be replaced with a production final inspection report.

Changed designs or poor manufacturing performance of the subcontractor may, at the sole discretion of the Administration, require a repeat of the FAI.

## 16.10 REQUIRED CDRLS

1601 Software Quality Assurance Plan (16.2) [Only Required for New Systems]

1602 Quality Plan (16.4.1)

1603 List of Items Subject to FAI (16.7.1)

1604 Hold-Point Inspection List (16.7.4)

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 3**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: June 13, 2013

Enclosed and effective this date is Addendum No.3 to the subject Contract. This Addendum reflects changes made to the solicitation as mentioned on the attached list.

Receipt of proposals to this solicitation will now be accepted on, but not after, 2:00 PM July 24, 2013 as stated in the Addendum 3 items below.

The proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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Acknowledgement of receipt of ADDENDUM #3 to Solicitation #T-8000-0399

Vendor Name: _____

_____ _____
Authorized Representative's Signature Date

**A list of the changes made to this solicitation follows:**

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Contract Specifications | | |
|---|---|---|
| **Item No. (Referenced #)** | **Page or Section** | **Modification** |
| **One** | **Section I Page 1 of 7** | **Section A.1 <u>Schedule of Activities,</u> shall now read:**<br>**A.1 <u>Schedule of Activities</u>**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**<u>ITEM</u>** — **<u>DATE</u>**<br><br>RFP Issue Date — April 4, 2013<br><br>Pre-Proposal Conference — April 17, 2013<br><br>Additional Vehicle Inspection — May 21, 2013<br><br>Proposal Inquiry Deadline — May 31, 2013<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~June 28, 2013~~ **July 24, 2013**<br><br>Anticipated Best and Final Offer (BAFO) ~~August 30, 2013~~ **September 30, 2013**<br><br>Anticipated Selection Date — ~~September 17, 2013~~ **October 28, 2013**<br><br>Anticipated Notice to Proceed — ~~December 3, 2013~~ **January 13, 2014** |

| | | |
|---|---|---|
| **Two** | **Section I**<br>**Page 2 of 7** | **Section B.6 <u>Closing Date</u> shall now read:**<br>**B.6 <u>Closing Date</u>**<br><br>One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m.** local time, ~~**June 28, 2013**~~ **July 24, 2013**, addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>1331 S. Monroe Street, 2nd Floor<br>Baltimore, Maryland 21230<br><br>In addition, a separate sealed package containing one (1) original, five (5) copies, **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the** Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

| | | |
|---|---|---|
| **Three** | **Special Provisions B-2** | **Section B.2.5.1 <u>Closing Date</u> shall now read:**<br>One (1) original bound Technical Proposal, five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard-copies and electronic copy must be submitted not later than **2:00 p.m.** local time, ~~**June 28, 2013**~~ **July 24, 2013** addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>1331 S. Monroe Street, 2nd Floor<br>Baltimore, Maryland 21230<br><br>In addition, a separate sealed package containing one (1) original and five (5) copies, and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as **"Technical Proposal for Contract T-8000-0399"** or **"Price Proposal for Contract T-8000-0399"** as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

| | | |
|---|---|---|
| **Four** | **Special Provisions B-7** | **Section B.20 SCHEDULE OF ACTIVITIES shall now read:**<br><br>**B.20 SCHEDULE OF ACTIVITIES**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**ITEM** — **DATE**<br><br>RFP Issue Date — April 4, 2013<br><br>Pre-Proposal Conference — April 17, 2013<br><br>Additional Vehicle Inspection — May 21, 2013<br><br>Proposal Inquiry Deadline — May 31, 2013<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~June 28, 2013~~ **July 24, 2013**<br><br>Anticipated Best and Final Offer (BAFO) ~~August 30, 2013~~ **September 30, 2013**<br><br>Anticipated Selection Date — ~~September 17, 2013~~ **October 28, 2013**<br><br>Anticipated Notice to Proceed — ~~December 3, 2013~~ **January 13, 2014** |

# B. PROPOSAL REQUIREMENTS

# B. PROPOSAL REQUIREMENTS

## B.1 GENERAL

In addition to the General Provisions, this section specifies the general requirements for the preparation and submittal of Proposals in response to this Request for Proposals (RFP).

## B.2 PREPARATION OF PROPOSAL

### B.2.1 General

The MTA is soliciting an RFP that explains how the Proposer will meet the requirements of this procurement. Statements merely indicating that the Proposer will meet specific requirements are not acceptable. Technical descriptions should be such that the MTA is able to relate what is being offered to equipment that has been used in revenue service on other rail transit systems.

The MTA recognizes that there may be elements of the Proposal considered proprietary and confidential by the Proposer. The Proposal shall identify any specific information or design details that the Proposer considers proprietary. The Proposer shall clearly and prominently mark each and every page or sheet of such materials with "CONFIDENTIAL" and "PROPRIETARY," as it determines to be appropriate.

The MTA will disclose the information only in accordance with the Maryland Public Information Act. Under no circumstances, however, will the MTA be responsible or liable to the Proposer or any other party for the disclosure of such labeled material, for any reason whatsoever.

### B.2.2 Issue Date

April 4, 2013

### B.2.3 Issuing Office

This RFP is issued by the Office of Procurement of the Maryland Transit Administration and the sole point of contact for contractual questions. This office is the sole point of contact in the MTA for this RFP.

### B.2.4 Inquiries

Inquiries concerning this proposal shall be submitted in writing to the Office of Procurement, Maryland Transit Administration, 1331 S. Monroe Street, Second Floor, Baltimore, Maryland 21230, Attention: Heidi J. Tarleton (410) 454-7895. All inquiries and the corresponding MTA response will be posted on the e-Maryland Marketplace web site. Closing date for receipt of inquiries is **May 13, 2013**.

### B.2.5 Submittal of Proposals

Proposals shall be submitted under the following guidelines.

#### B.2.5.1 Closing Date

One (1) original bound Technical Proposal, six (6) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard-copies and electronic copy must be submitted not later than **2:00 p.m.** local time, **July 24, 2013** addressed to:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
1331 S. Monroe Street, Second Floor
Baltimore, Maryland 21230

In addition, a separate sealed package containing **one (1)** original and **five (5)** copies **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format)** of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as **"Technical Proposal for Contract T-8000-0399"** or **"Price Proposal for Contract T-8000-0399"** as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted.

#### B.2.5.2 Addenda and Supplements

In the event that it becomes necessary to revise any part of this RFP, or if additional information is necessary to enable the Proposer to make an adequate interpretation of the provisions of the RFP, a supplement will be provided to firms who are identified as holders of the RFP.

#### B.2.5.3 Acknowledgment of Addenda

The Proposer shall acknowledge receipt of all addenda in the cover letter of the Technical Proposal. Failure to acknowledge all addenda shall cause the rejection of the Proposal.

#### B.2.5.4 Language Requirement

All language in the Proposal shall be prepared in English. All Contract documents, conferences, letters, technical information, and drawings shall be conducted or offered solely in the English language. All dimensions shall be in the U.S. inch/pound units and metric equivalent, if applicable.

### B.2.5.5 Proposal Clarity and Completeness

To be considered, the Proposer is to submit a complete response to the RFP addressing the items requested. Proposal brevity and clarity are desired. The Proposer is advised that the MTA is not obligated to expend extraordinary effort if the Proposal is unclear, difficult to assess, and/or incomplete. At the sole discretion of the MTA such Proposals may be classified as unacceptable.

### B.2.5.6 Oral Presentation

The Proposer may be required to make individual presentations or demonstrations in order to clarify their Proposals and to verify technical submissions. The MTA will not be responsible for any costs incurred by the Proposer in the preparation of oral presentations.

### B.2.5.7 Incurring Costs

The MTA is not liable for any cost incurred by the Offeror in preparation of its Proposal for this Contract.

### B.2.5.9 Multiple Proposals

If the Offeror has more than one (1) method or more than one (1) subcontractor for meeting the objectives of the RFP, multiple Proposals may be submitted. Additional Proposals may be prepared in an abbreviated form following the same format as the primary Proposal, but containing only that information which differs in any way from the primary Proposal. Each Proposal must be bound separately and submitted in accordance with Section B.2.5.1 above. In all cases, to be considered responsive, each Proposal must clearly meet the objectives and needs of the Administration.

## B.3 ANTI-DUMPING ACT

Foreign Offerors shall represent and warrant that their prices do not violate the United States Anti-Dumping Act, U.S. Code, Title 19, Section 160 et seg., as amended. They shall agree to pay any duties assessed under the said Act and to indemnify and hold harmless the Administration from any loss or expense, including but not limited to reasonable attorney's fees that the Administration may incur from any claim, demand, or investigation of alleged violation of the said Act.

## B.4 SUBMITTAL OF PRICE PROPOSALS

The Price Proposal and the Technical Proposal, and any other documents as may be specified when executed and submitted by the Offeror, will constitute his Proposal. Price Proposals not presented on the Unit Price Schedule will not be considered. The Price Proposal shall be filled out in ink or typewritten. If erasures or changes appear in the Price Proposal, each erasure or change shall be initialed and dated by the individual signing the Price Proposal.

All documents bound with or attached to the Proposal are considered a part thereof and shall not be detached or altered when the Proposal is submitted. Proposals shall be submitted in the manner specified.

The Offeror shall specify a price in U.S. dollars for each item given and shall show the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Proposal obtained by adding the amounts of the several items.

## B.5 PROPOSAL BID BOND

A Proposal Bid Bond is **NOT REQUIRED** for this contract.

## B.6 ARREARAGES

By submitting a response to this RFP, an Offeror shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing to the State of Maryland, including the payment of taxes and employee benefits, and that it shall not become so in arrears during the term of the contract if selected for contract award.

## B.7 PRE-PROPOSAL CONFERENCE

A conference for all Offerors will be held on **April 17, 3013** at the **MARC Martins Maintenance Facility, 2700 Eastern Blvd., Middle River, Maryland 21220** beginning at **9:00 am** followed by a site inspection. The site inspection shall afford the Offerors an opportunity to inspect a representative vehicle(s). All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team.

## B.8 DISCUSSIONS

The Administration may enter into discussions with all Qualified Offerors. The term "Qualified Offerors" includes only those responsible Offerors who submitted proposals initially judged by the Procurement Officer to be reasonably susceptible of being selected for award. Discussions shall be led by the Offeror's Project Manager and will consist of an oral presentation by the Offeror to the Administration's Evaluation Committee, questions from and negotiations with the Committee and Procurement Officer. Offerors shall be notified of the time, date, and location of the discussions. **Submission of a proposal does <u>not</u> guarantee an Offeror the opportunity to be invited in for discussions.**

The Administration retains the right, at its discretion, not to hold discussions with Offerors and may award a contract on the basis of technical and price proposals as submitted if, in the judgment of the Procurement Officer, the response to this RFP demonstrates sufficient competition so that acceptance of an initial offer without negotiation would result in a fair and reasonable price.

## B.9 THE PROPOSALS

To be considered, Offerors shall submit a complete response to the RFP using the format provided. This proposal format is mandatory. Proposals should provide a straightforward, concise delineation of the Offeror's capability to satisfy the requirements of this RFP.

## B.10 SIGNATURES

Each proposal shall be signed by an officer authorized to make a binding commitment for the firm(s) making the proposals.

## B.11 MINORITY BUSINESS ENTERPRISE

1. It is the goal of MTA that Minority Business Enterprises (MBE) participate in all projects. The MTA hereby notifies all Proposers that in regard to any contract entered into pursuant to this RFP, MBEs will not be subject to discrimination on the basis of race, color, sex, or national origin in consideration for an award.

    a. An overall DBE subcontract participation of **9% of the total contract dollar amount** has been established for this procurement.

2. A fully executed "Certified DBE Utilization and Fair Solicitation Affidavit" and "DBE Participation Schedule" shall be submitted with the Technical Proposal. Failure to submit the required documents with the Offer shall result in the Proposer's Proposal as being not reasonably susceptible of being selected for award.

3. ALL DBE FIRMS PROPOSED MUST BE CERTIFIED BY MDOT hh TIME OF SUBMITTAL OF PROPOSAL. This process takes an average of six months. By submitting a response to this RFP, the Proposer agrees that, as a minimum, this percentage of the contract price will be allocated to DBEs.

4. MBE Participation in work performed under this contract will be monitored by the State and must be in accordance with **Exhibit E (Contract Exhibits)**.

5. Questions or concerns regarding the DBE requirements of this solicitation must be raised before the opening of bids or receipt of initial proposals.

6. A current directory of MBEs is available through the Maryland State Department of Transportation, Office of Minority Business Enterprise, P.O. Box 548, 7201 Corporate Center Drive, Hanover, Maryland 21076. The phone number is 410-865-1269 or 1-800-544-6056.

7. The directory is also available at http://www.mdot.state.md.us. Select the MBE Program label at the left side of the web site, half way down. The most current and up-to-date information on MBEs is available via this web site.

## B.12 PROMPT PAYMENT OF SUBCONTRACTORS

This procurement and the contract to be awarded pursuant to this solicitation are subject to the Prompt Payment Policy Directive issued by the Governor's Office of Minority Affairs (GOMA) and dated August 1, 2008. Promulgated pursuant to Sections 11-201, 13-205(a), and Title 14, Subtitle 3 of the State Finance and Procurement Article (SFP), and Code of Maryland Regulations (COMAR) 21.01.01.03 and 21.11.03.01 et seq., the Directive seeks to ensure the prompt payment of all subcontractors on non-construction procurement contracts. The successful Offeror who is awarded a contract must comply with the prompt payment requirements. Additional information is available on the GOMA website at www.mdminoritybusiness.com.

## B.13 COMPLIANCE WITH LAW

By submitting an offer in response to this RFP, the Proposer, if selected for award, agrees that it will comply with all Federal, State, and local laws applicable to its activities and obligations under the contract. By submitting an Offer in response to this RFP, the Proposer shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and employee benefits, and if selected for award, that it shall not become so in arrears during the term of the contract.

## B.14 ACCEPTANCE OF TERMS AND CONDITIONS

By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.

## B.15 CONFLICT OF INTEREST - CONFIDENTIALITY

The Proposer covenants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of services under this RFP. Without limitation, the Proposer represents to and agrees with the State that the Proposer has no conflict of interest between providing the State services hereunder and any interest the Proposer may have with respect to any other person or entity (including but not limited to any Federal or State regulatory agency) which has any interest adverse or potentially adverse to the State.

The selected Proposer agrees that any information, whether proprietary or not, made known to or discovered by it during the performance of, or in connection with, this RFP will be kept confidential and not be disclosed to any person other than the State, its designated officials, employees, and authorized agents. The Proposer agrees to immediately notify the State in writing if it is requested to disclose any information made known to or discovered by it during the performance of or in connection with this RFP.

## B.16 PROTESTS

Any protest relating to this solicitation or the award of a contract must be filed in accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotate Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

## B.17 INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's proposal in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the contract to be entered into as a result of this RFP.

## B.18 MEDIA ANNOUNCEMENTS

No media announcements written or oral, pertaining to this RFP or the services, study or project to which it relates shall be made without Administration approval and then only in coordination with the issuing office.

## B.19 USE OF "E-MARYLAND MARKETPLACE"

"E-Maryland Marketplace" is an electronic commerce system administered by the Maryland Department of General Services. In addition to using the MTA web site (https://emaryland.buyspeed.com) and other means for transmitting the RFP and associated materials, the solicitation and minutes of the pre-proposal conference, proposer questions and MTA responses, addenda, and other solicitation related information will be provided via e-Maryland Marketplace.

## B.20 SCHEDULE OF ACTIVITIES

The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.

| ITEM | DATE |
|---|---|
| RFP Issue Date | **April 4, 2013** |
| Pre-Proposal Conference and vehicle inspection (**TBD**) | **April 17, 2013** |
| **Additional Vehicle Inspection** | **May 21, 2013** |
| Proposal Inquiry Deadline | **May 31, 2013** |
| Closing Date for Receipt of Proposals (2:00 p.m.) | **July 24, 2013** |
| Anticipated Best and Final Offer (BAFO) | **September 30, 2013** |
| Anticipated Selection Date | **October 28, 2013** |

| | |
|---|---|
| Anticipated Notice to Proceed | **January 13, 2014** |

# I. SOLICITATION INFORMATION AND INSTRUCTIONS

# SECTION I
# SOLICITATION INFORMATION AND INSTRUCTIONS
# MARC III KAWASAKI COACHES (63) OVERHAUL
# RFP T-8000-0399

## A. GENERAL

This section specifies the general requirements for the preparation and submittal of Proposals in response to this Request for Proposals (RFP).

### A.1 Schedule of Activities

The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.

| ITEM | DATE |
|---|---|
| RFP Issue Date | April 4, 2013 |
| Pre-Proposal Conference | April 17, 2013 |
| Additional Vehicle Inspection | May 21, 2013 |
| Proposal Inquiry Deadline | May 31, 2013 |
| Closing Date for Receipt of Proposals (2:00 p.m.) | July 24, 2013 |
| Anticipated Best and Final Offer (BAFO) | September 30, 2013 |
| Anticipated Selection Date | October 28, 2013 |
| Anticipated Notice to Proceed | January 13, 2014 |

## B. PREPARATION OF PROPOSAL

### B.1 General

The MTA is soliciting an RFP that explains how the Proposer will meet the requirements of this procurement. Statements merely indicating that the Proposer will meet specific requirements are not acceptable. Technical descriptions should be such that the Administration is able to relate what is being offered to equipment that has been used in revenue service on other rail transit systems.

The MTA recognizes that there may be elements of the Proposal considered proprietary and confidential by the Proposer. The Proposal shall identify any specific information or design details that the Proposer considers proprietary. The Proposer shall clearly and prominently mark each and every page or sheet of such materials with "CONFIDENTIAL" and "PROPRIETARY," as it determines to be appropriate.

The MTA will disclose the information only in accordance with the Maryland Public Information Act. Under no circumstances, however, will the MTA be responsible or liable to the Proposer or any other party for the disclosure of such labeled material, for any reason whatsoever.

## B.2 Issue Date

**April 4, 2013**

## B.3 Issuing Office

This RFP is issued by the Office of Procurement of the Maryland Transit Administration and the sole point of contact for contractual questions. This office is the sole point of contact in the MTA for this RFP.

## B.4 Inquiries

Inquiries and/or questions concerning this proposal shall be submitted in writing on Form 22, Section IV, Exhibit A1, and e-mailed to the Procurement Officer designated below:

**Heidi J. Tarleton**
**Office of Procurement**
**Maryland Transit Administration**
**E-Mail: htarletonprocurementofficer@mta.maryland.gov**

All inquiries and the corresponding MTA responses will be posted on the MTA website at http://www.mta.maryland.gov/solicitations. All questions and requests must be received at the e-mail address specified above no later than 4:00 p.m., local time on **May 31, 2013**.

No requests or inquiries will be considered unless delivered as specified above. The e-mail submitting questions must include the requestor's name, e-mail address, telephone and fax numbers, and the Proposer he/she represents.

## B.5 Submittal of Proposals

Proposals shall be submitted under the following guidelines.

## B.6 Closing Date

One (1) original bound Technical Proposal, ten (10) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m.** local

time, **July 24, 2013**, addressed to:

Attn: Heidi J. Tarleton
Maryland Transit Administration
Office of Procurement
1331 S. Monroe Street, 2nd Floor
Baltimore, Maryland 21230

In addition, a separate sealed package containing one (1) original and **five (5) copies, and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format)** of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted.

## B.7 Addenda and Supplements

In the event that it becomes necessary to revise any part of this RFP, or if additional information is necessary to enable the Proposer to make an adequate interpretation of the provisions of the RFP, a supplement will be provided to firms who are identified as holders of the RFP.

## B.8 Acknowledgment of Addenda

The Proposer shall acknowledge receipt of all addenda in the cover letter of the Technical Proposal. Failure to acknowledge all addenda shall cause the rejection of the Proposal.

## B.9 Language Requirement

All language in the Proposal shall be prepared in English. All Contract documents, conferences, letters, technical information, and drawings shall be conducted or offered solely in the English language. All dimensions shall be in the U.S. inch/pound units and metric equivalent, if applicable.

## B.10 Proposal Clarity and Completeness

To be considered, the Proposer is to submit a complete response to the RFP addressing the items requested. Proposal brevity and clarity are desired. The Proposer is advised that the MTA is not obligated to expend extraordinary effort if the Proposal is unclear, difficult to assess, and/or incomplete. At the sole discretion of the MTA such Proposals may be classified as unacceptable.

## B.11 Oral Presentation

The Proposer will be required to make individual presentations or demonstrations in

order to clarify their Proposals and to verify technical submissions. The MTA will not be responsible for any costs incurred by the Proposer in the preparation of oral presentations.

### B.12 Incurring Costs

The MTA is not liable for any cost incurred by the Offeror in preparation of its Proposal for this Contract.

## C. SUBMITTAL OF PRICE PROPOSALS

The Price Proposal and the Technical Proposal, and any other documents as may be specified when executed and submitted by the Offeror, will constitute his Proposal. Price Proposals not presented on the Unit Price Schedule will not be considered. The Price Proposal shall be filled out in ink or typewritten. If erasures or changes appear in the Price Proposal, each erasure or change shall be initialed and dated by the individual signing the Price Proposal.

All documents bound with or attached to the Proposal are considered a part thereof and shall not be detached or altered when the Proposal is submitted. Proposals shall be submitted in the manner specified.

The Offeror shall specify a price in U.S. dollars for each item given and shall show the products of the respective unit prices and quantities written in figures in the column provided for that purpose, together with the total amount of the Proposal obtained by adding the amounts of the several items.

## D. PRE-PROPOSAL CONFERENCE

A conference for all Offerors will be held on **April 17, 2013** at the **MARC Martins Maintenance Facility, 2700 Eastern Blvd, Middle River, Maryland 21220**, beginning at **9:00 a.m.** All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team.

## E. DISCUSSIONS

The Administration may enter into discussions with all Qualified Offerors. The term "Qualified Offerors" includes only those responsible Offerors who submitted proposals initially judged by the Procurement Officer to be reasonably susceptible of being selected for award. Discussions shall be led by the Offeror's Project Manager and will consist of an oral presentation by the Offeror to the Administration's Evaluation Committee, questions from and negotiations with the Committee and Procurement Officer. Offerors shall be notified of the time, date, and location of the discussions. **Submission of a proposal does <u>not</u> guarantee an Offeror the opportunity to be invited in for discussions.**

The Administration retains the right, at its discretion, not to hold discussions with Offerors and may award a contract on the basis of technical and price proposals as submitted if, in the judgment of the Procurement Officer, the response to this RFP demonstrates sufficient competition so that acceptance of an initial offer without negotiation would result in a fair and reasonable price.

## F. BEST AND FINAL OFFERS (BAFO)

When it is in the best interest of the State, the Procurement Officer may permit qualified Offeror(s) to revise their initial proposals by submitting BAFO. This action is in accordance with COMAR 21.05.03.03.D.

## G. THE PROPOSALS

To be considered, Offerors shall submit a complete response to the RFP using the format provided. This proposal format is mandatory. Proposals should provide a straightforward, concise delineation of the Offeror's capability to satisfy the requirements of this RFP.

## H. SIGNATURES

Each proposal shall be signed by an officer authorized to make a binding commitment for the firm(s) making the proposals.

## I. DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

1. **DISADVANTAGED BUSINESS ENTERPRISES ARE ENCOURAGED TO RESPOND TO THIS SOLICITATION NOTICE.**

2. The Maryland Transit Administration hereby notifies all Offerors that, in regard to any Contracts entered into pursuant to this advertisement, Disadvantaged Business Enterprises will be afforded full opportunity to submit Proposals in response to this Notice, and will not be subjected to discrimination on the basis of political or religious opinion or affiliation, race, color, creed, sex, age or national origin in consideration for an award.

3. It is the goal of the Administration that Disadvantaged Business Enterprises participate in all Contracts. Each Contract will contain goals for Disadvantaged Business Enterprise participation on a contracts-to-contracts basis. A subcontracting goal of thirteen percent (9%) has been established for this procurement. All bidders/Offeror must submit with their proposal a fully executed copy of the Certified DBE Utilization and Fair Solicitation Affidavit (MDOT DBE FORM A) and DBE Participation Schedule (MDOT DBE FORM B). **Failure to submit the required documents with offer shall result in the Offeror's Technical Proposal as not being deemed reasonably susceptible of being selected for award.**

4. **A Offeror may count toward its DBE goal 60 percent of its expenditures for materials and supplies required under the contract and obtained from a DBE regular dealer, and 100 percent of such expenditures to a DBE manufacturer. The DBE credited supplies may not exceed 60 percent of the entire contract goal.**

5. ALL DBE FIRMS MUST BE CERTIFIED BY THE MARYLAND DEPARTMENT OF TRANSPORTATION AT THE TIME OF TECHNICAL PROPOSAL SUBMITTAL. NO OTHER CERTIFICATIONS WILL BE ACCEPTED. **This process takes an**

**average of SIX months.** By submitting a response to this RFP, the Offeror agrees that, as a minimum, this percentage of the contracts price will be allocated to DBE's.

6. DBE Participation in work performed under this contract will be monitored by the State and must be in accordance with Exhibit E (Contract Exhibits).

7. **Questions or concerns regarding the DBE requirements of this solicitation must be raised before the receipt of technical proposals.**

8. A current directory of DBE/MBE's is available through the Maryland State Department of Transportation, Office of Minority Business Enterprise, P. O. Box 548, 7201 Corporate Center Drive, Hanover, Maryland 21076. The phone number is 410-865-1269 or 1-800-544-6056.

9. **The directory is also available at** http://www.mdot.state.md.us. **Select the Minority/Disadvantaged Business Enterprise link at the left side of the web site, half way down. The most current and up-to-date information on DBE/MBE's is available via this website.**

## J. COMPLIANCE WITH LAW

By submitting an offer in response to this RFP, the Proposer, if selected for award, agrees that it will comply with all Federal, State, and local laws applicable to its activities and obligations under the contract. By submitting an Offer in response to this RFP, the Proposer shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and employee benefits, and if selected for award, that it shall not become so in arrears during the term of the contract.

## K. ACCEPTANCE OF TERMS AND CONDITIONS

By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.

## L. CONFLICT OF INTEREST - CONFIDENTIALITY

The Proposer covenants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of services under this RFP. Without limitation, the Proposer represents to and agrees with the State that the Proposer has no conflict of interest between providing the State services hereunder and any interest the Proposer may have with respect to any other person or entity (including but not limited to any Federal or State regulatory agency) which has any interest adverse or potentially adverse to the State.

The selected Proposer agrees that any information, whether proprietary or not, made known to or discovered by it during the performance of, or in connection with, this RFP will be kept confidential and not be disclosed to any person other than the State, its designated officials, employees, and authorized agents. The Proposer agrees to immediately notify the State in

writing if it is requested to disclose any information made known to or discovered by it during the performance of or in connection with this RFP.

## M. PROTESTS

Any protest relating to this solicitation or the award of a contract must be filed in accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotate Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

## N. INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's proposal in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the contract to be entered into as a result of this RFP.

## O. MEDIA ANNOUNCEMENTS

No media announcements written or oral, pertaining to this RFP or the services, study or project to which it relates shall be made without Administration approval and then only in coordination with the issuing office.

## P. USE OF "e-MARYLAND MARKETPLACE"

"E-Maryland Marketplace" is an electronic commerce system administered by the Maryland Department of General Services. This means that all such information is immediately available to subscribers to e-Maryland Marketplace. Because of the instant access afforded by e-Maryland Marketplace, it is recommended that all Bidders interested in doing business with Maryland State agencies subscribe to e-Maryland Marketplace.

**In order to receive a contracts award, a vendor must be registered on e-Maryland Marketplace.**

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration
Procurement Division, 7th Floor
6 Saint Paul Street
Baltimore, Maryland 21202-1614

SUBJECT: **Addendum No. 2**
**Contract No. T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: May 10, 2013

Enclosed and effective this date is Addendum No.2 to the subject Contract. This Addendum reflects changes made to the solicitation as mentioned on the attached list and includes responses to Planholder's written questions in Addendum No. 2 Attachment A.

An additional vehicle inspection for all Offerors will be held on May 21, 2013 at the MARC Martins Maintenance Facility, 2700 Eastern Blvd, Middle River, Maryland 21220, beginning at 9:00 a.m. All Offerors are encouraged to attend this meeting, but attendance is not mandatory. Attendance should be limited to no more than four (4) representatives per proposing team. Safety equipment such as closed toe shoesvand safety glasses must be worn during the inspection. Power will be removed and lockers will be opened upon request. Pictures will not be allowed during the site visit.

The proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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Acknowledgement of receipt of ADDENDUM #2 to Solicitation #T-8000-0399

Vendor Name: _____

_____ _____
Authorized Representative's Signature Date

**A list of the changes made to this solicitation follows:**

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Contract Specifications | | |
|---|---|---|
| **Item No. (Referenced #)** | **Page or Section** | **Modification** |
| **One (Q#2)** | **Section I Page 1 of 7** | **Section A.1 <u>Schedule of Activities,</u> shall now read:**<br>**A.1 <u>Schedule of Activities</u>**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**<u>ITEM</u>** **<u>DATE</u>**<br><br>RFP Issue Date April 4, 2013<br><br>Pre-Proposal Conference April 17, 2013<br><br>**Additional Vehicle Inspection May 21, 2013**<br><br>Proposal Inquiry Deadline ~~May 13, 2013~~ **May 31, 2013**<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~June 24, 2013~~ **June 28, 2013**<br><br>Anticipated Best and Final Offer (BAFO) August 30, 2013<br><br>Anticipated Selection Date September 17, 2013<br><br>Anticipated Notice to Proceed December 3, 2013 |
| **Two (Q#2)** | **Section I Page 2 of 7** | **Section B.4 Inquiries 3rd paragraph shall now read:**<br><br>All inquiries and the corresponding MTA responses will be posted on the MTA website at http://www.mta.maryland.gov/solicitations. All questions and requests must be received at the e-mail address specified above no later than 4:00 p.m., local time on ~~**May 13, 2013**~~ **May 31, 2013** |

| | | |
|---|---|---|
| **Three (Q#2) (Q#3)** | **Section I Page 2 of 7** | **Section B.6 <u>Closing Date</u> shall now read:**<br>**B.6 <u>Closing Date</u>**<br><br>One (1) original bound Technical Proposal, ~~ten (10)~~ five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard copies and electronic copy must be submitted not later than **2:00 p.m**. local time, ~~**June 24, 2013**~~ **June 28, 2013**, addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>1331 S. Monroe Street, 2nd Floor<br>Baltimore, Maryland 21230<br><br>In addition, a separate sealed package containing one (1) original ~~and ten (10)~~ five (5) copies, **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) of the** Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as "Technical Proposal for Contract T-8000-0399" or "Price Proposal for Contract T-8000-0399" as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified, shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

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**Four**

**(Q#7)**

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**Special Provisions A-5**

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**Section A.4.5 <u>Completion of Work Schedule</u> shall now read:**

**A.4.5 <u>Completion of Work Schedule</u>**

<table>
<tr><th>ITEM OF WORK</th><th>REQUIREMENT</th></tr>
<tr><td>1. Deliver First (1st) Overhauled Vehicle – Trailer car</td><td>NTP + ~~**270**~~ **365** days</td></tr>
<tr><td>2. Deliver Second (2rd) Overhauled Vehicle – Cab car</td><td>NTP + ~~**270**~~ **365** days</td></tr>
<tr><td>3. Deliver Third (3rd) Overhauled Vehicle – Trailer w/Toilet</td><td>NTP + ~~**270**~~ **365** days</td></tr>
<tr><td>4. Deliver Fourth (4th) through Sixty-third (63rd) Overhauled Vehicle</td><td>Access + **120** days<br>or<br>NTP + **920** days<br>whichever occurs first</td></tr>
<tr><td>5. Deliver Draft Revision of Manuals for Training Purposes</td><td>NTP + ~~**240**~~ **300** days</td></tr>
<tr><td>6. Complete Training</td><td>NTP + ~~**260**~~ **380** days</td></tr>
<tr><td>7. Deliver Diagnostic and Test Equipment and Special Tools</td><td>NTP + **465** days</td></tr>
<tr><td>8. Deliver Mandatory Spare Parts</td><td>NTP + **465** days</td></tr>
<tr><td>9. Delivery Recommended Spare Parts</td><td>NTP + **850** days</td></tr>
<tr><td>10. Deliver Final Revision of Manuals</td><td>NTP + **920** days</td></tr>
<tr><td>11. Deliver As-Built Drawings and All Deliverables (Including Conformed Specification</td><td>NTP + **920** days</td></tr>
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**Five**

**(Q#2)**

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**Special Provisions B-1**

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**Section B.2.4 <u>Inquiries</u> shall now read:**

**B.2.4 <u>Inquiries</u>**

Inquiries concerning this proposal shall be submitted in writing to the Office of Procurement, Maryland Transit Administration, 1331 S. Monroe Street, Second Floor, Baltimore, Maryland 21230, Attention: Heidi J. Tarleton (410) 454-7895. All inquiries and the corresponding MTA response will be posted on the e-Maryland Marketplace web site. Closing date for receipt of inquiries is ~~**May 13, 2013**~~ **May 31, 2013**.

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|---|---|---|
| **Six**<br><br>**(Q#2)**<br>**(Q#3)** | **Special Provisions B-2** | **Section B.2.5.1 <u>Closing Date</u> shall now read:**<br>One (1) original bound Technical Proposal, ~~six (6)~~ five (5) bound copies, and one (1) unbound copy (suitable for photocopy reproduction) of the complete Technical Proposal shall be submitted. In addition, one (1) electronic copy in CDROM or DVD media (searchable *.pdf format) containing the Technical Proposal responses to Special Provisions Sections C.3 and C.4., shall also be submitted. The hard-copies and electronic copy must be submitted not later than **2:00 p.m.** local time, ~~**June 24, 2013**~~ **June 28, 2013** addressed to:<br><br>Attn: Heidi J. Tarleton<br>Maryland Transit Administration<br>Office of Procurement<br>1331 S. Monroe Street, 2nd Floor<br>Baltimore, Maryland 21230<br><br>In addition, a separate sealed package containing **one (1)** original and **five (5)** copies, **and one (1) electronic copy in CDROM or DVD media (searchable *.pdf format)** of the Price Proposal must be submitted to the same office by the same time. Each package shall be clearly and separately labeled on the outside as **"Technical Proposal for Contract T-8000-0399"** or **"Price Proposal for Contract T-8000-0399"** as appropriate. There will not be a public opening of the Proposals. Proposals that are not delivered by the time and date stated, or marked as specified shall be rejected in accordance with applicable regulations. Electronic and fax proposals will not be accepted. |

| | | |
|---|---|---|
| **Seven**<br><br>**(Q#2)** | **Special Provisions B-7** | **Section B.20 SCHEDULE OF ACTIVITIES shall now read:**<br><br>**B.20 SCHEDULE OF ACTIVITIES**<br><br>The MTA has established the following schedule for progressing this RFP. The anticipated dates are only an estimate, and the MTA shall adjust the dates at its sole discretion.<br><br>**ITEM** — **DATE**<br><br>RFP Issue Date — April 4, 2013<br><br>Pre-Proposal Conference — April 17, 2013<br><br>**Additional Vehicle Inspection — May 21, 2013**<br><br>Proposal Inquiry Deadline — ~~May 13, 2013~~ **May 31, 2013**<br><br>Closing Date for Receipt of Proposals (2:00 p.m.) ~~June 24, 2013~~ **June 28, 2013**<br><br>Anticipated Best and Final Offer (BAFO) — August 30, 2013<br><br>Anticipated Selection Date — September 17, 2013<br><br>Anticipated Notice to Proceed — December 3, 2013 |
| **Eight** | **Technical Specification TS 2-6** | **Section 2.4.7 Suspension , 2nd paragraph shall now read:**<br>Existing rubber coated coil springs **shall be replaced with OEM springs.** ~~inspected for damage and replaced if bulged, torn, peeled, or cracked with OEM or Administration approved equivalent. Replacement springs shall meet the exact OEM specifications. Replacement primary springs shall be free issued by the Administration.~~ |

| | | |
|---|---|---|
| **Nine** | **Technical Specification TS 2-8** | **Section 2.5 SPARE TRUCKS , shall be deleted in its entirety and replaced with the following :**<br><br>**2.5 SPARE TRUCKS**<br>**The Administration has eight (8) spare truck assemblies (truck frame and bolster) that shall be overhauled as part of this scope of work. The eight (8) spare truck frames and bolsters may be used as float material during the course of the project. The components shall be overhauled as applicable and reassembled in the as-provided configuration and returned over the course of the project.** |
| **Ten** | **Technical Specification Section 6** | **Section 06 Interior Furnishings shall be replaced in its entirety with the Section 6 in Addendum 2 Attachment B.** |
| **Eleven**<br><br>**(Q#15)** | **Technical Specification TS 10-1** | **Section 10.3.1 <u>Temperature Controller</u> , first sentence shall be modified to read:**<br>The existing temperature control controller, manufactured by Stone Service Corporation shall be replaced with **a Vapor Temperature Control Unit (part no. 2010400017) or an Administration approved equivalent** microprocessor controller compatible with the existing control voltages and control logic developed by the OEM. |
| **Twelve** | **Section II Proposal Form With Unit Price Schedule Page 5** | **The entire UNIT PRICE SCHEDULE (BID FORM) shall be deleted and replaced with the UNIT PRICE SCHEDULE (BID FORM) in Addendum 2 Attachment C.** |

# Addendum No. 2

## Attachment A - Responses to Planholder's Written Questions

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 2 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | ADMINISTRATION RESPONSE |
|---|---|---|---|---|
| 1 | **Section I Solicitation Information and Instructions** | Item A.1 Schedule of Activities Page SI-1 | In order to design in the best way the proposal we request the MTA to provide a DVD with the complete package of the Manuals, drawings, reliability data, engineering changes. | Please see Addendum 1, Item II. All available information has been included on the DVD. |
| 2 | **Section I Solicitation Information and Instructions**<br><br>**Special Provisions Section B. Proposal Requirements** | A.1 Schedule of Activities<br><br>D. Pre-Proposal Conference<br><br>B.20 Schedule Of Activities | Relative to the site visit, we request that a second site visit be scheduled where power is not on the cars so that panels and lockers can be opened. During the first site visit, with power on the cars, our ability to see the detail of many subsystems, lockers and panels was limited or non-existent. If a second site visit can be quickly scheduled, we request that the May 13 deadline for submission of questions be extended a few days after that second site visit. | Please see Addendum 2 Items 1,2,3,5,6,7. |
| 3 | **Section I Solicitation Information And Instructions**<br><br>**RFP Section B. Proposal Requirements** | B.6 Documentation<br><br>B.2.5.1 Closing Date | In the section "B.6" 10 copies of the technical and price proposal are requested, while in the section "B.2.5.1" 6 copies for the Technical and 5 copies for the price proposal are requested.<br>Can the Authority confirm the correct numbers of copies are requested? | Please see Addendum 2 Items 3, 6. |
| 4 | **Section II Proposal Form With Unit Price Schedule** | Unit Price Schedule (Bid Form) | Schedule (Bid Form)<br>Is "Avg. cost based on Item 2 Total Price" the value obtained dividing the Total price Item 2 for 63?<br>If not, please advise the correct calculation. | Yes. |

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 2 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | ADMINISTRATION RESPONSE |
|---|---|---|---|---|
| 5 | **Section IV Proposal Exhibits**<br><br>**Exhibit Z – General Provisions for Purchase Contracts** | **13. General Indemnity** | The indemnity requirement is overly broad – not limited to Contractor negligence. Proposers will have to price in this risk accordingly. Would MTA consider deleting this language and replacing with the following?<br>"The Contractor shall indemnify, defend, and save harmless MTA, its officers, agents, and employees against all suits, claims, or liability of every name and nature, for or due to any injuries to persons or damage to property arising out of or in consequence of the negligent acts or negligent failure to act of the Contractor in the performance of the work covered by the Contract or failing to comply with the terms and conditions of the Contract, whether by the Contractor or the Contractor's employees or Subcontractors." | No change. |
| 6 | **Section IV Proposal Exhibits**<br><br>**Exhibit Z – General Provisions for Purchase Contracts** | **13. General Indemnity** | If selected, the Contractor would have unlimited liability under the contract. Proposers will have to price in this risk accordingly. Would the Administration consider inserting the following requirement: "LIMITATION OF LIABILITY Contractor's total aggregate liability under the contract whether based upon contract, tort (including negligence and strict liability) or otherwise, shall in no event exceed one hundred percent (100%) of the total contract value. All claims by the Administration against the Contractor arising under the contract shall be brought within three (3) years after the end of the warranty under this contract." | No change. |
| 7 | **Section V Special Provisions A. Summary Of Work** | A.4.5 Completion of Work Schedule | The delivery of the first 3 coaches in 9 Months is very tight. After a preliminary analysis we think that the more appropriate period could by something between 12 and 15 Months. Will the Authority accept a project schedule in line with this new scenario? | Please see Addendum 2 Item 4. |
| 8 | **Section V Special Provisions A. Summary Of Work** | A. General | Special Provisions, Section A.1 seems to suggest exceptions to terms and conditions can be submitted by the Offeror, however other provisions in Special Provisions and Solicitation Instructions state:<br>Special Provisions, B.14 Acceptance Of All Terms, states: By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.<br>Solicitation Instructions, SI-6, item, K. Acceptance Of Terms And Conditions states: By submitting an offer in response to this RFP, an Offeror shall be deemed to have accepted all the terms, conditions, and requirements set forth in this RFP.<br>Can the Offeror propose exceptions to the terms and conditions? | Yes, please see Special Provisions Section C.3.8.2. |

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 2 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | ADMINISTRATION RESPONSE |
|---|---|---|---|---|
| 9 | **Section V Special Provisions D. Prosecution And Progress** | D.10 Liquidated Damages For Times Of Completion | Liquidated Damages are quantified, but are not capped. Proposers will have to price in this risk accordingly. Would MTA consider capping cumulative Liquidated Damages at 5% of Contract Value? | No change. |
| 10 | **Section V Special Provisions D. Prosecution And Progress** | | Consequential Damages are not addressed in the RFP. Proposers will have to price in this risk accordingly. Would MTA consider inserting the following language into the contract?: "EXCLUSION OF LIABILITY FOR CONSEQUENTIAL LOSS OR DAMAGE<br>Notwithstanding any other provision of this Contract, Contractor shall not be liable to the Administration by way of indemnity or by reason of any breach of this Contract or of statutory duty or by reason of any liability (including, but not limited to negligence) for loss of profit, loss of subsidy, loss of production, loss of any tax benefit, financing costs, or for any financial or economic loss or for any indirect or consequential damage or loss whatsoever that may be suffered by the Administration or any third party." | No change. |
| 11 | **Section V Special Provisions F. Legal Requirements** | F.2.3 Hazardous Materials | In order to allocate the correct cost in the proposal to remove the hazardous materials from the coaches, we request to receive the map of the hazardous materials on the cars.<br>If this is not possible, we request the authority to consider the activity to remove it as "change order" in order to not over-estimate the cost in the tender phase and to allow all competitors to propose the same scope of work. | The Administration does not have a hazardous material map. Please refer to Special Provisions Section F.2.3. Miscellaneous Work Allowance in order to cover any potential asbestos abatement |
| 12 | **Section V Special Provisions F. Legal Requirements** | F.8 Rights In Technical Data | In lieu of providing intellectual property directly to the Administration, its employees and consultants, Contractor intends to place its intellectual property (the "Escrow Materials") and any subcontractor intellectual property, including technical data, copies of the current system design, source code and object code, related documentation including, without limitation, annotated notes for the Contractor's and subcontractor's software and Contractor and subcontractor's non commercially available software with an independent escrow agent, subject to the terms and conditions of the independent escrow agent's standard agreement (the "Escrow Agreement") and in accordance with the provisions of the Section F.8. Is this intention acceptable to the Administration? | Yes, acceptable. |

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 2 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | ADMINISTRATION RESPONSE |
|---|---|---|---|---|
| 13 | **Section VI Technical Specification**<br><br>**SECTION 02 TRUCKS AND SUSPENSION** | 2.5 Spare Trucks | "The Contractor shall be responsible for providing all missing material to produce complete ready-to-run truck assemblies, including but not limited to, wheels, axles, roller bearings, brake equipment, brake actuators, piping, wiring, primary springs, elastomeric elements and air springs"<br>In order to quote the spare trucks overhaul properly we request to receive the list of the missing parts for each of the 8 spare trucks. | Please see Addendum 2 Item 9. |
| 14 | **Section VI Technical Specification**<br><br>**SECTION 04 AIR BRAKE** | 4.4.1 WABCO E-7 Decelostat | Present requirement states:<br><br>The existing WABCO E-7 DECELOSTAT, wheel slip-slide detection and correction controller located in the Electric Locker shall be replaced with a KNORR MGS2 system or Administration approved equivalent.<br><br>The supplier requests that MTA consider the following revision:<br><br>Note: The existing WABCO E-7 DECELOSTAT, wheel slip-slide detection and correction controller located in the Electric Locker shall be replaced with a KNORR MBS2 wheel slide control system, **an upgraded WPT E-7 DECELOSTAT Controller** or Administration approved equivalent. | No change. |
| 15 | **Section VI Technical Specification**<br><br>**SECTION 10 HVAC** | 10.3.1 Temperature Controller | The Vapor temperature Control Unit, part no. 2010400017 has been running as a prototype HVAC controller on MARC Cab Car 7851 for about 3 years. I send this to you as it is a direct reference to Section 10. Heating, Ventilating and Air conditioning Controls (HVAC) Unit and Controls. Specifically see section 10.3/10.3.1 TS, page 10-1. We respectfully request that this device be referenced in the specification. This project was carried out in conjunction with MARC Maintenance and Engineering Personnel. | Please see Addendum 2 Item 11. |

# T8000-0399 MARC III (63) COACHES OVERHAUL – ADDENDUM 2 RESPONSES TO PLANHOLDER'S WRITTEN QUESTIONS

| # | RFP REFERENCE | RFP SUBSECTION | PROPOSER COMMENT | ADMINISTRATION RESPONSE |
|---|---|---|---|---|
| 16 | **Addendum 1** | **Item #3** | Present requirement states:<br><br>Note: The replacement of the WABCO E-7 DECELOSTAT system with a KNORR MBS2 wheel slide control system is a mandatory work scope item.<br><br>The supplier requests that MTA consider the following revision:<br><br>Note: The replacement of the WABCO E-7 DECELOSTAT system with a KNORR MBS2 wheel slide control system or an upgraded WPT E-7 DECELOSTAT Controller is a mandatory work scope item. | No change. |

# Addendum No. 2

## Attachment B - SECTION 06 INTERIOR FURNISHINGS

# SECTION 06
# INTERIOR FURNISHINGS

# SECTION 06
# INTERIOR FURNISHINGS

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# SECTION 06
# INTERIOR FURNISHINGS

## 6.1 GENERAL SYSTEM DESCRIPTION

There are four types of Bi-Level trailer cars involved in this overhaul; Cab with Toilet, Trailer, Trailer with Snack Bar, and Trailer with Toilet. The information in this section shall apply to all four types, unless specifically stated otherwise.

This section will cover the overhaul requirements for the following subsystems: Floor Panels, Floor Coverings, Wall Panels, Frieze Panels, Ceiling Panels, Stairs, Seats, Fire Extinguishers, and Signage. Unless otherwise specified, all interior parts accessible or visible to passengers and not discussed in other parts of this specification shall be overhauled.

Refer to TS Section 01 - Carbody for overhaul requirements for Windows, Window Glazings, Vestibule End Doors, and Passenger Boarding Doors. Refer to TS Section 07 – Toilet Room and TS Section 08 Water and Waste Retention for overhaul requirements for Toilet Rooms, Water Supply Systems, and Waste Retention Systems.

## 6.2 OVERHAUL REQUIREMENTS

An Interior Furnishings Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul. **[CDRL 601]** All interior components shall be cleaned, repaired and returned to their as-built OEM condition. All enclosures and equipment areas shall be cleaned and returned to OEM condition.

The Contractor is responsible to conduct a complete overhaul of the vehicle interior furnishings. The objective of this overhaul is to repair, replace or reconfigure components in order to return the cars to their as built configuration and functionality. The vehicle interior may have been modified by running repairs during the service life of the vehicles and it is the Contractor's responsibility to obtain the complete interior specification and overhaul requirements from the OEM.

An inspection shall be performed before each car ships from MARC to determine if any interior components are damaged beyond repair or missing. The Contractor shall advise the Administration, in writing, of those missing or damaged beyond repair components within 7 days of the pre-shipment inspection.

### 6.2.1 Materials

All materials that are overhauled, replaced, repaired, or renewed shall conform to the smoke and flammability requirements of 49 CFR PART 238. Conformance to this requirement is the responsibility of the contractor.

Where side or end linings are attached to the structure, low smoke neoprene shall be provided between the panels and the structure.

Where linings cover apparatus requiring even infrequent maintenance, they shall be fastened with accepted fasteners in a manner allowing ready removal and replacement.

The Contractor shall submit the proposed method of attachment of linings to the Administration for review and acceptance. **[CDRL 602].**

No exposed fasteners shall be added to the interior of the coaches unless specifically requested of and accepted by the Administration.

Interior linings and moldings shall be free of undulations. The maximum acceptable variation from a straight line, on all interior surfaces subject to passenger view, shall be 0.125" in 36" (3.2 mm/m) measured in any direction.

In compliance with 49 CFR 238.233, sharp edges within the car, if unavoidable, shall be padded to mitigate the consequences of an impact with such surfaces.

To the extent possible, all interior fittings in the passenger car, except seats, shall be recessed or flush mounted.

Any replaced and/or renewed interior fittings shall be verified to be in full compliance with 49 CFR 238.233. All fittings attached to the car body shall withstand the following accelerations acting on the mass of the fitting:

Longitudinal: 8g

Vertical: 4g

Lateral: 4g

### 6.2.2 ADA Accessibility

Any modifications to the car design shall strive to maximize the accessibility for patrons in wheelchairs per 49 parts CFR 27, 37 and 38, Transportation Services for Persons with Disabilities.

No modification shall reduce the current ADA accessibility of the coaches.

For any modifications that may affect ADA accessibility, the Contractor shall submit scale drawings showing the general arrangement for ADA access for review and approval by Administration. **[CDRL 603]**

### 6.2.3 Emergency Signage and LLEPM Requirements

At the beginning of the contract the Contractor shall make an assessment of each type of car to assure the vehicles conform to the latest requirements of APTA SS-PS-004 (latest version), "Standard for Low Level Exit Path Marking", and APTA SS-PS-002 (latest version), "Standard for Emergency Signage for Egress/Access of Passenger Rail Equipment". **All LLEPM shall be replaced.**

~~A. The Contractor shall submit their test procedures for testing the emergency signage and low level exit path marking requirements required above, as per TS Section 14.~~

~~B. The Contractor shall then submit an assessment report to the Administration summarizing the deficiencies, if any, and required changes to bring the cars into conformance with the standards. This requirement shall be completed prior to the start of car type overhaul. **[CDRL 604]**~~

All signage made with high performance photoluminescent material (HPPL) shall be renewed. The HPPL material shall meet the requirements of APTA SS-PS-002 (latest version). For estimating purposes, 100% of all HPPL material will be replaced.

### 6.2.4 Preparation and Inspection

All seats and seat pedestals shall be removed from the car exposing all interior floors, walls and ceiling, on all levels.

All ceiling panels shall be removed.

See Section 12 Communications for information regarding speakers.

### 6.2.5 Cleaning Agents

The interior shall be thoroughly cleaned with Administration-approved cleaners. A list is provided at the end of this section.

Administration-approved cleaners shall be used to thoroughly remove dirt, markings, or graffiti, and thereby restore the components to their original appearance to the extent possible.

### 6.2.6 Subfloor Panels

All subfloor panels shall be inspected for soft spots or plymetal panel delaminations. Any subfloor panel identified as defective shall be reported to the Administration for disposition.

Procedures for replacement of defective panels shall be submitted on a one-for-one basis to the Administration for approval. **[CDRL 605].**

### 6.2.7 Snack Bar Area

On snack bar cars, the Contractor shall inspect, clean, and overhaul the snack bar area to as-built OEM condition.

### 6.2.8 Floor Covering

Floor coverings in the upper and lower passenger levels shall be fully cleaned and overhauled to its original appearance.

All existing floor covering shall be inspected for damage, security, and possible hazards to personnel. Particular attention shall be paid to stair treads and areas where the floor covering curves into a vertical section. Any damaged sections shall be repaired and resealed. Resealed areas shall be watertight.

Floor covering is manufactured by Freudenberg Building Systems, Inc. under the trade name of Nora Rubber Flooring. The floor covering is of 'LAGO' floor tiles, each measuring 40.8 in. x 40.8 in. (1000 mm x 1000 mm), Nora Part No. 43274/180/388. The base color is 'Night Sky' with a 5% Ruby Red fleck. All floor areas of a car are covered with similar material, including stair treads and risers.

The Administration shall supply the Contractor with floor covering material to complete the overhauling of the floors.

### 6.2.9 Stair Coverings

At the upper ends of all interior stairs there shall be a non-slip, HPPL warning strip with a distinctive slip resistance surface. The Contractor shall submit alternate material samples and colors of the warning strip material to the Administration for review and approval. **[CDRL 606]** Tread and riser material shall be formed so as to provide a smooth front edge surface and eliminate tripping hazard.

Step edges (nosing) shall be incorporated into the one-piece step tread with stainless steel backing, and shall have a band of non-slip raised anti-slip material.

Each step tread shall incorporate a HPPL strip, running the full width of each step, near the front edge of the nosing, to delineate each step tread and riser, or adjacent floor, per ADA requirements. Step nosing shall be of one-piece construction, matching material to the step treads with stainless steel backing.

Step tread and nosing shall be fully supported by solid structure.

The basic tread color shall match the colors currently installed on all series cars.

As information, the existing stair nosing is supplied preformed, in a tan colored material, Nora Part No. T5019E0561. A radius cove former, Nora Part No. H 9010 is inserted at the junction of stair treads and risers to provide a smooth transition for floor covering before it is laid.

The Contractor shall use the manufacturer's recommended installation procedures. For estimating purposes, it is anticipated 75% of stair nosings will be replaced.

### 6.2.10 Eyeline Panels

Eyeline panels are those panels that are at eye level when standing, situated on the edge of the luggage racks, and below the window masks. Eyeline panels are ruby red melamine covered aluminum panels attached in a manner similar to the wainscot panels.

The Contractor shall clean and overhaul these panels.

### 6.2.11 Luggage Racks

Luggage racks consisting of longitudinal extruded aluminum extrusions are cantilevered from the sidewalls just above the window surrounds.

The Contractor shall clean and overhaul the luggage racks.

### 6.2.12 Window Masks

Window masks surround the windows and are made from thermoform C-PVC sheet, colored antique white. Window masks are held in place by aluminum extrusions, screws and Dual Lock fasteners and are kept separated from the structure by anti-squeak rubber glazing strips and tape. Window mask panels which adjoin one another are held in place with thermoform trim strips that are affixed to the car structure.

Window panel blanks provide blanking panels and are made from thermoform C-PVC sheet, colored antique white. Blank panels are held in place by aluminum extrusions, screws and Dual Lock fasteners and are kept separated from the structure by anti-squeak rubber glazing strips and tape.

The Contractor shall clean and overhaul these panels.

### 6.2.13 Wall Panels

The car sidewalls are similar in all seating areas. The primary feature is a single piece thermoformed plastic window surround. Below this sits a textile faced aluminum sheet wainscot panel, which extends down to a floor level stainless steel heater cover.

Above the window surrounds are variously profiled melamine faced aluminum sheet (metalcore) panels that extend to the ceiling.

Partitions, access panels, and other non-sidewall panels are also made of melamine faced aluminum sheet (metalcore) panels.

The Contractor shall clean and overhaul these panels.

### 6.2.14 Wainscot Panels

Below the window surround sits a textile faced aluminum sheet wainscot panel, which extends down to a floor level stainless steel heater cover.

Wainscot paneling is covered with low-pile carpeting (Gro-point), all edges held captive with moldings.

The Contractor shall clean and overhaul these panels.

### 6.2.15 Floor Heaters and Grills

Refer to TS Section 10.3.9 for floor heaters and grills.

### 6.2.16 Kickstrips

The bottom of all exposed bulkheads, partitions, and sidewall panels are fitted with a kickstrips. Kick strips are made from stainless steel with a brush finish and held in place with oval headed screws. Kick strips are positioned at the bottom of a panel for protection of the panel.

The Contractor shall overhaul all kickstrips in accordance with the OEM procedures.

Any kickstrip that cannot be overhauled shall be renewed. For estimating purposes, it is anticipated 5% of kickstrips will be replaced.

### 6.2.17 Handrails

Stainless steel handrails are attached to the stair sidewalls for use with the stairs giving access to the upper or lower level. Each handrail is fixed to the stair sidewall panel with four fixing plates and countersunk screws.

The Contractor shall overhaul all handrails in accordance with OEM procedures.

### 6.2.18 Ceiling Panels

Combined lights and air-conditioning diffuser units run the length of the seating areas, above the center aisles.

A. Melamine faced aluminum honeycomb of 3/8 inch thickness form air-conditioning ducts between these diffusers and the upper sidewalls.

B. The ceiling space between diffusers in upper and lower passenger areas is finished with a metalcore center panel.

C. Center ceilings in the mid-level are of 1/4 inch melamine faced aluminum honeycomb and are hinged for access to the HVAC equipment.

The Contractor shall clean all ceiling panels and renew as needed.

### 6.2.19 Advertising Card Frames

Advertising card frames shall be cleaned or, if broken or missing, renewed. Any advertising material which has been adhesively bonded to walls shall be removed and discarded; the walls shall be cleaned to remove any residue adhesive material.

### 6.2.20 Lights and Fixtures

Refer to TS Section 11 – Lighting.

### 6.2.21 Air Diffusers and Ductwork

Refer to TS Section 10.3.8 for air diffusers and ductwork.

### 6.2.22 Interior Trim and Moldings

All trim and moldings shall be cleaned and overhauled to restore the original surface finish.

### 6.2.23 Seats

Seat System Overview:

A. The seats are of three main types: Reclining, fixed, and flip-up seat. Each seat type is mounted into the car through a combination of wall-mount brackets, pedestal bases, and box mounts. The number of armrests varies according to the seat types from none to three. There are a total of 19 different seat configurations. As listed in the table, below.

B. Right hand and left hand seats are distinguished by which side the car wall is on while sitting in the seat. (A right hand seat will be on the right wall).

**Table 6.1- Seats description**

| DESCRIPTION | TYPE | ARM RESTS | GRAB HANDLE | MOUNTING |
|---|---|---|---|---|
| Reclining 2-passenger RH | A2a | 3 | Y | Pedestal + Sidewall |
| Reclining 2-passenger LH | A2b | 3 | Y | Pedestal + Sidewall |
| Reclining 1-passenger LH | Alb | 2 | Y | Pedestal + Sidewall |
| Fixed 2-passenger RH | B2a | 1 | Y | Pedestal + Sidewall |
| Fixed 2-passenger LH | B2b | 1 | Y | Pedestal + Sidewall |
| Fixed 2-passenger Generic | D2c | 0 | N/A | Box |
| Fixed 3-passenger RH | D3a | 1 | N/A | Box |
| Fixed 2-passenger RH | E2a | 0 | N/A | Pedestal + Sidewall |
| Fixed 2-passenger LH | E2b | 0 | N/A | Pedestal + Sidewall |
| Fixed 2-passenger RH | F2a | 0 | N/A | Pedestal + Box |
| Fixed 2-passenger RH | F2b | 0 | N/A | Pedestal + Box |
| Flip-up 2-passenger RH | C2a | 0 | N/A | 2 Pedestals { 1 High + 1 Short) |
| Flip-up 2-passenger LH | C2b | 0 | N/A | 2 Pedestals ( 1 High + 1 Short) |
| Flip-up 2-passenger Generic | C2c | 0 | N/A | 2 High Pedestals |
| Flip-up 1-passenger RH | C1a | 0 | N/A | 2 Pedestals ( 1 High + 1 Short) |
| Flip-up I -passenger LH | Clb | 0 | N/A | 2 Pedestals ( 1 High + 1 Short) |
| Flip-up 1-passenger Generic | C1c | 0 | N/A | 2 High Pedestals |
| Flip-up 2-passenger RH | C2d | Same as C2a except 1 crashpad on left side | | |
| Flip-up 2-passenger Generic | C2c | Same as C2c except 2 crashpads on left and right | | |

C. Overhaul Requirements:

1. The seating system will be refurbished.

D. New springs enclosed in canvas, new bottom and armrest cushion foam will be used on all assemblies. The headrest, crash pad and back foam will be new and encapsulated in muslin. New upholstery covers will be used on all assemblies. The existing headrest, crash pad, back, armrest and bottom pans will be reused.

E. The MARC III seating replacements will meet operational and storage requirements of the Maryland Transit Authority. All components will meet or exceed the standards and construction as specified by the Federal Railroad Administration and APTA.

F. Passenger seat bottom cushion foam will be a low smoke, low toxicity, fire resistant MF1-8055 or MTA approved equivalent, open cell silicone foam.

G. Passenger seat back, headrest and crash pad foam will be a low smoke, low toxicity, fire retardant, low density resilient melamine foam product designated as Manelite or MTA Approved equivalent. The foam is manufactured by MTI Specialty Silicones, Inc. (Magnifoam)

H. Passenger armrest foam will be a low smoke, low toxicity fire resistant open cell neoprene foam. The foam pad will be manufactured with CR SAFGUARD XXX-Firm from Chestnut Ridge Foam, Inc., or MTA Approved Equivalent.

I. Seat upholstery vinyl shall be a transportation grade woven fabric backed vinyl with a standard weight of 23.5 ounces per square yard. The vinyl will be UNIROYAL ENGINEERED PRODUCTS TT-77, or MTA Approved Equivalent, 221699 Stock Number, legion blue.

J. The seat fabric will be made of 100% polyester CS Trevira fabric or MTA Approved Equivalent. The fabric is manufactured by Lantal Textiles (F079100046DS2 Airbrush Steel). The fabric will comply with ASTM E662 smoke, FAR 25.853 flammability and BSS 7239 toxicity requirements

1. Stainless steel seat pedestals shall be thoroughly cleaned and overhauled.

2. The contractor shall replace all seat components, as originally installed, after floors and interior linings are overhauled.

K. As an Option the Contractor shall submit a proposal to reconfigure the seating in the 13 VRE order coaches. The seat spacing and direction for the seats shall match the MARC style seating arrangement.

### 6.2.24 Fire Extinguishers

A fire extinguisher is mounted in a lower level enclosure located beneath the upper stairway. The extinguisher is held in place with a mounting bracket and is accessible by removing the clear plastic front cover, which is held in place with Velcro strips along the edges.

All fire extinguishers shall be removed and retained at the Administration, before shipping cars to the Contractor's facility.

Fire extinguisher storage cases shall be overhauled to ensure that the fire extinguishers are properly secured, but accessible for use.

The Contractor shall replace all clear plastic covers.

To prevent further loss of covers, at all fire extinguisher locations the Contractor shall add a lanyard between the fire extinguisher cubical and the plastic cover. The lanyard shall be a 12" long wire rope lanyard, made of uncoated Type 302/304 Stainless Steel Wire Rope, 7 x 19 Strand Core, 0.125" diameter, with a crimped eyelet termination on each end. The lanyard shall be fully contained within the fire extinguisher enclosure when the cover is installed. The Contractor shall submit the proposed design to the Administration for approval. **[CDRL 607]**

### 6.2.25 Under Seat Trash Bin and Shroud

An under seat trash bin is fitted at the back to back seats on either side of the car on both the upper and lower passenger areas. It consists of a metal shroud which fits under the seat and is screwed to the floor and a metal trash bin which fits into the shroud.

The Contractor shall clean, inspect and overhaul or repair the under seat trash bin and its method of fixation.

### 6.2.26 Electrical Outlets

All 120 VAC electrical outlets shall be replaced with new duplex receptacles.

All floor 120 VAC electrical outlets shall have new stainless steel cover plates applied.

Refer to TS Section 5.2.3 for the option of installation of a duplex or strip electrical outlet at each seat location.

### 6.2.27 Nameplate

The Contractor shall apply a "REBUILDERS NAMEPLATE" adjacent to the OEM carbuilder's plate. The nameplate shall be cosmetically similar to the OEM nameplate, using similar materials, lettering, and color finishes.

The nameplate shall include the name of the rebuilder, place of remanufacture, and the year of remanufacture.

## 6.3 REQUIRED CDRLS

601 An Interior Furnishings Overall Overhaul Plan shall be submitted to the Administration for review and approval prior to starting the overhaul.

602 The Contractor shall submit the proposed method of attachment of linings.

603 The Contractor shall submit scale drawings showing the general arrangement for ADA access for review and approval.

604 ~~The Contractor shall submit an LLEPM assessment report to the Administration summarizing deficiencies.~~ Not used.

605 Procedures for replacement of subfloor defective panels shall be submitted on a one-for-one basis for approval.

606 The Contractor shall submit alternate material samples and colors of the warning strip material for review and approval.

607 The Contractor shall submit details of the fire extinguisher lanyard.

**ADMINISTRATION APPROVED**

**CLEANING AGENTS**

| COMPONENT | RECOMMENDED CLEANING AGENT | PREPARATION AND TECHNIQUE | SUPPLIER |
|---|---|---|---|
| Carpet covered panels | ZEP R3194 Railcar carpet and surface cleaner | Mix 1 : 32 Apply solution with Sponge on cloth. Rinse well. | ZEP Manufacturing Company, PO Box 2019, Atlanta, Georgia, 90301. Tel 404-352-1680 |
| Window masks and wall panel boards (Schneller) | ZEP R3194 Railcar carpet and surface cleaner | Mix 1 : 32 Apply solution with sponge on cloth. Rinse well. | ZEP Manufacturing company, PO Box 2019, Atlanta, Georgia, 90301 Tel 404-352-1680. |
| Eyeline panels Ceiling panels, Air conditioning panels, partition panels | FR 2194 Alkaline cleaner | Mix 1 : 10 | FO Fine, Organics Corp, 205 Main St, Lodi NJ, 07644. Tel 800-526-7480. |
| Stainless steel Kickstrips Handrails | SW/65 | Shake well, spray directly on surface or on wet cloth. Wipe clean and polish with clean dry cloth. | BETCO Corp, Toledo Ohio, 1001 Brown avenue, 43607. Tel 419-241-2156. |
| Vinyl guards | NELCO vinyl guard | Shines and conditions vinyl. | NELCO INC, PO box 369, Chestnut hill MA, 02167. Tel 817-232-9709. |
| Window masks | E-clean plastic cleaner, mild alkaline cleanser | | NELCO products INC, PO box 850, Providence highway, Denham MA, 02026. |

**ADMINISTRATION APPROVED**

**CLEANING AGENTS**

| COMPONENT | RECOMMENDED CLEANING AGENT | PREPARATION AND TECHNIQUE | SUPPLIER |
|---|---|---|---|
| Melamine door pocket panels | Spot remover RID-A-GUM. Complex mixture of Petroleum hydrocarbons | | RID-A-GUM INC, 160 Westcott Blvd, Staten island NY, 10314 |
| Toilet sink | A-33 liquid detergent/disinfectant | Mix 1 : 8 | AIRKEM Professional products division of ECOLAB INC, St Paul MN, 55102. |
| All toilet room equipment | A-33 liquid detergent/disinfectant | Mix 1 : 20 | AIRKEM Professional Products division of ECOLAB INC, St Pails MN, 55102. Tel 817-232-9709. |
| Toilet panels | NELECO Graffiti remover | | NELCO INC, PO box 369, Chestnut hill MA, 02167. |

# Addendum No. 2

## Attachment C - UNIT PRICE SCHEDULE (BID FORM)

## Contract T-8000-0399
## UNIT PRICE SCHEDULE (BID FORM)

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | TOTAL PRICE |
|---|---|---|---|---|---|
| | **Base Scope of Work:** | | | | |
| **1.** | **Management, Engineering, Tooling and Testing** | **Lump Sum** | | | **$ _____** |
| **1a.** | **Management, Engineering, Tooling and Testing - Mobilization** | **Lump Sum** | | | **$ _____** |
| **2.** | **MARC III Railcars Overhaul** | | | | |
| | 2-1a Carbody: Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-1b Carbody: Trailer Car (Incl. Snack) | Carset | 42 | $_____ | $ _____ |
| | 2-1c Carbody: Trailer w/Toilet | Carset | 7 | $_____ | $ _____ |
| | 2-2 Trucks and Suspension | Carset | 63 | $_____ | $ _____ |
| | 2-3 Couplers and Draft Gear | Carset | 63 | $_____ | $ _____ |
| | 2-4 Air Brake | Carset | 63 | $_____ | $ _____ |
| | 2-5 Electrical | Carset | 63 | $_____ | $ _____ |
| | 2-6 Interior | Carset | 63 | $_____ | $ _____ |
| | 2-7 Toilet Room | Carset | 21 | $_____ | $ _____ |
| | 2-8 Water and Waste Retention | Carset | 21 | $_____ | $ _____ |
| | 2-9 Doors | Carset | 63 | $_____ | $ _____ |
| | 2-10 HVAC | Carset | 63 | $_____ | $ _____ |
| | 2-11 Lighting | Carset | 63 | $_____ | $ _____ |
| | 2-12 Communications; Cab Car | Carset | 14 | $_____ | $ _____ |
| | 2-12b Communications: Trailer, Snack, TwT | Carset | 49 | $_____ | $ _____ |
| | 2-13 Cab Equipment | Carset | 14 | $_____ | $ _____ |
| | | | | **(Avg. cost based on Item 2 Total Price)** | **Sum of Items 2-1 through 2-13** |
| | | | | **$_____** | **$ _____** |
| **3.** | Spares (new spares and overhaul of existing spares) | Lump Sum | | | $ _____ |
| **4.** | Special Tools and DTE (new special tools and DTE and overhaul of existing special tools and DTE) | Lump Sum | | | $ _____ |
| **5.** | Training | Lump Sum | | | $ _____ |
| **6.** | Manuals | Lump Sum | | | $ _____ |
| **7.** | **Base Scope of Work Total Price [Sum of Items 1, 1a, 2, 3, 4, 5, and 6]** | | | | **$ _____** |
| | **Option Scope of Work:** | | | | |
| 8. | Stepwell Surface Replacement (TS 1.3.7) | Carset | 63 | $_____ | $ _____ |
| 9. | Parking Brake Cable Replacement (TS 4.4.5) | Carset | 63 | $_____ | $ _____ |
| 10. | VRE Style Seating Reconfiguration (TS 6.2.23 ) | Carset | 13 | $_____ | $ _____ |
| 11. | Passenger Convenience Outlets (5.2.3) | Carset | 63 | $_____ | $ _____ |
| 12. | New Toilet Room Module (7.3) | Carset | 21 | $_____ | $ _____ |
| 13. | Incandescent Lighting Replacement (11.2.1) | Carset | 63 | $_____ | $ _____ |
| 14. | Operators Seat Replacement (13.2.11) | Carset | 14 | $_____ | $ _____ |
| **(A)** | **Option Scope of Work Total Price [Sum of Items 8, 9, 10, 11, 12, 13, and 14]** | | | | **$ _____** |
| **16.** | **Miscellaneous Work Allowance** | Lump Sum | | | **$ 1,250,000** |
| **17.** | **Hidden Damage Allowance** | Lump Sum | | | **$ 500,000** |

**TOTAL PRICE [Sum of 7, (A), 16, and 17]** **$ _____**

MARYLAND TRANSIT ADMINISTRATION
MARYLAND DEPARTMENT OF TRANSPORTATION
Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

TO: All Planholders

FROM: Maryland Transit Administration

SUBJECT: **ADDENDUM NO. 1**
**Contract No.: T-8000-0399**
MARC III Kawasaki Coaches (63) Overhaul

DATE: April 25, 2013

Enclosed and effective this date is Addendum No. 1 to the subject Contract. This addendum reflects changes made to the solicitation as mentioned on the attached list.

A conformed copy of the revised specification will be available on our website at www.mta.maryland.gov/procurement .

The Proposer shall acknowledge receipt of this Addendum by completing and returning this form with the proposal package.

All other terms and conditions remain unchanged.

Sincerely,

Heidi J. Tarleton
Procurement Officer
Procurement Division

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ACKNOWLEDGEMENT OF RECEIPT OF ADDENDUM NO. 1 TO SOLICITATION T-8000-0399

VENDOR NAME: _____

_____ _____
AUTHORIZED REPRESENTATIVE'S SIGNATURE DATE

A list of the changes made to this solicitation is as follows:

The following additions, deletions, and modifications are hereby made a part of the Contract Documents of MARC III Kawasaki Coaches (63) Overhaul, Contract No.: T-8000-0399.

| Item No. | Page | Modification |
|---|---|---|
| CONTRACT SPECIFICATIONS | | |
| | | |
| **I** | **Section I, Page 5 of 7** | I. **DISADVANTAGED BUSINESS ENTERPRISE PROGRAM**<br><br>3. It is the goal of the Administration that Disadvantaged Business Enterprises participate in all Contracts. Each Contract will contain goals for Disadvantaged Business Enterprise participation on a contracts-to-contracts basis. A subcontracting goal of ~~thirteen~~ nine percent (9%) has been established for this procurement. All bidders/Offeror must submit with their proposal a fully executed copy of the Certified DBE Utilization and Fair Solicitation Affidavit (MDOT DBE FORM A) and DBE Participation Schedule (MDOT DBE FORM B). **Failure to submit the required documents with offer shall result in the Offeror's Technical Proposal as not being deemed reasonably susceptible of being selected for award.** |
| **II** | **Drawings** | For information purposes, please note that DVDs containing the MARC III Technical Documents and Drawing Package are available, at no cost, upon request to Heidi J. Tarleton by email at htarletonprocurementofficer@mta.maryland.gov. The documents on these DVDs are for reference purposes only and are provided with no warranty or guarantee as to accuracy, readability, suitability, or fitness of purpose. |
| **III** | **TS Section 04, Air Brake Section 4.2** | ~~An option to replace the WABCO E-7 DECELOSTAT system with a KNORR MGS2 wheel slide control system is further discussed below.~~ Note: The replacement of the WABCO E-7 DECELOSTAT system with a KNORR MGS2 wheel slide control system is a mandatory work scope item. |
| | | |